ENFIELD INTERMODAL LOGISTIC CENTRE

Precinct E
Construction Environmental Management Plan

Prepared for:

Goodman Limited
Level 17
60 Castlereagh Street
Sydney NSW 2000

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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 Limited (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.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
630.12792-R01-v1.0	16 October 2019	Samantha Hayes	Nathan Archer	Nathan Archer
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1 Background

1.1 Development Overview

NSW Ports (the Proponent), in partnership with Goodman (the Developer), is currently constructing the Enfield Intermodal Logistic Centre (ILC) located to the west of Cosgrove Road and to the north of Punchbowl Road in South Strathfield, New South Wales (NSW).

NSW Ports obtained Project Approval MP 05_0147 on 5 September 2007 from the Department of Planning, Industry and Environment (DPIE) for the construction and operation of Enfield ILC with capacity to accept a maximum throughput of 300,000 TEU (one TEU is equivalent to one twenty foot container) per annum, including:

- Demolition, relocation or removal of former railway buildings and structures;
- Earthworks and drainage including the levelling of the site, formation of landscape mounds and detention basins and removal of unsuitable materials, as required;
- Construction and operation of:
    - An intermodal terminal for the loading and unloading of containers;
    - Rail sidings, railway lines and associated works to connect to the existing freight line;
    - Warehousing for the packing and unpacking of containers and the short-term storage of cargo;
    - Empty container storage facilities, for the storage of empty containers to be later packed or transferred back to the port or regionally by rail;
    - Light industrial/commercial area fronting Cosgrove Road;
    - Access works including the construction of a road bridge over the new marshalling yards for access to Wentworth Street and an upgrade of the entrance to the site from Cosgrove Road; and
    - Internal roads, administration buildings, diesel and liquefied petroleum gas (LPG) storage and fuelling facilities, container washdown area, vehicle maintenance shed, and installation of site services (all utilities, stormwater and sewerage).

Since Project Approval MP 05_0147 was first issued in September 2007, it has been modified on ten occasions, with one additional modification application (Mod 10) currently being considered by DPIE.

In total, 14 modifications to MP 05_0147 have been proposed, comprising:

- Mod 1 – approved on 7 October 2008 to amend the number of dust monitoring sites;
- Mod 2 – approved on 30 March 2009 to amend the timing for submission of the Site Audit Statement;
- Mod 3 – withdrawn;
- Mod 4 – approved on 27 May 2010 to amend changes following detailed design;
- Mod 5 – approved on 10 November 2011 to relocate unsuitable fill material to a different site location;
- Mod 6 – approved on 12 December 2012 to amend the site layout and other minor changes;
- Mod 7 – withdrawn;
- Mod 8 – approved on 27 November 2013 to subdivide the Enfield ILC site into 23 allotments;

- Mod 9 – withdrawn;
- Mod 10 – pending approval for the inclusion of additional freight-related operational activities within the intermodal terminal;
- Mod 11 – approved on 8 February 2017 to construct and operate Warehouse G;
- Mod 12 – approved on 7 March 2017 to extend rail sidings and expand the administration building;
- Mod 13 – approved on 19 June 2018 to remove the land at the Tarpaulin building location and remediate into a garden centre and hardware/building supplies development; and
- Mod 14 – approved on 28 August 2018 to amend the site layout.

For the purposes of this document, the Enfield ILC is described in:

- Project Approval Modification Application - Intermodal Logistics Centre at Enfield, Sydney Ports Corporation (Sydney Ports Corporation 2009);
- Intermodal Logistics Centre at Enfield - Modification Application (Sydney Ports Corporation 2009);
- Intermodal Logistics Centre at Enfield - Modification Application No. 5 (Sydney Ports Corporation 2011);
- Intermodal Logistics Centre at Enfield - Modification Application No. 6 (Sydney Ports Corporation 2012) and Response to Submissions (RTS);
- Intermodal Logistics Centre: Enfield - Modification Application No. 8 (NSW Ports 2013);
- Environmental Assessment Modification Application No. 11 (Additional Warehouse) - Intermodal Logistics Centre at Enfield (TFA Project Group 2016) and RTS;
- Environmental Assessment Modification Application No. 12 (Extension of Existing Rail Sidings and Administration Office Expansion) - Intermodal Logistics Centre at Enfield (TFA Project Group 2016) and RTS;
- MP 05_0147 Modification Application No. 13 (LJB Urban Planning 2017) and RTS; and
- Modification Report MP 05_0147 Enfield Intermodal Logistics Centre (Mod 14) (Urbis 2018) and RTS.

A copy of Project Approval MP 05_0147 (as modified) is attached as **Appendix A**.

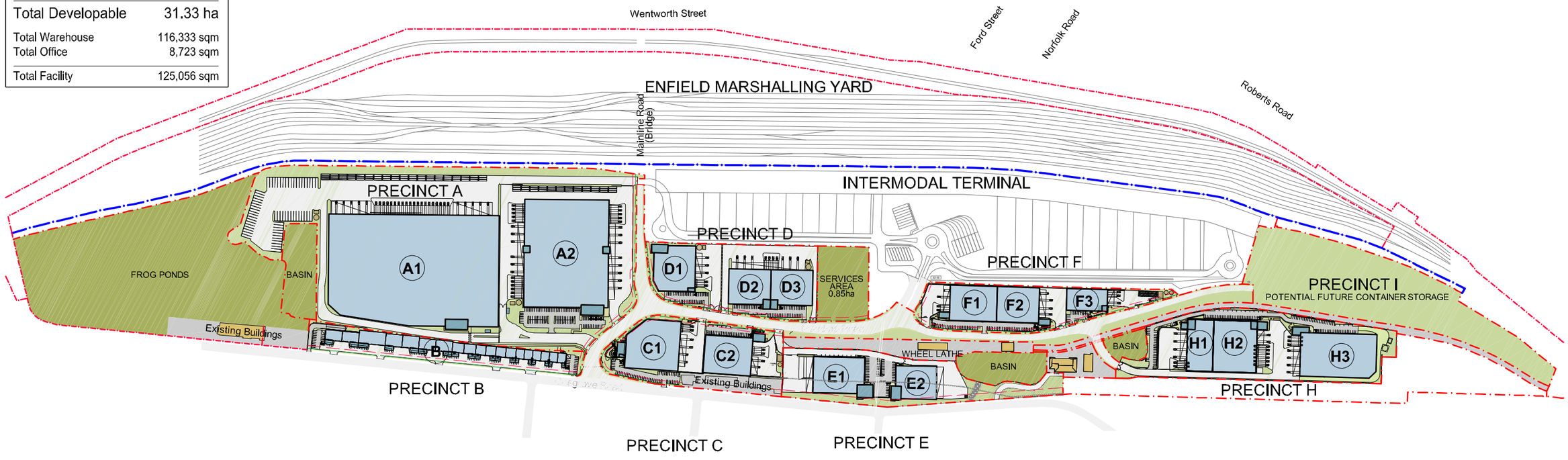
This *Construction Environmental Management Plan* (CEMP) has been prepared following the approval of Mod 14 of MP 05_0147 to cover the construction works undertaken at Precinct E within Enfield ILC (the Development). NSW Ports in conjunction with Goodman have engaged Qanstruct to complete the construction of Precinct E. Qanstruct will implement this CEMP throughout the construction of Precinct E.

Figure 1 shows the layout of the Enfield ILC and **Figure 2** details the layout of Precinct E.

NSWPorts in partnership with Goodman

Site Area Schedule

Total Site Area	**59.32 ha**
Less:	
Roads	2.98 ha
Ecological Zones	6.72 ha
Basins	1.51 ha
Intermodal Terminal & Railway	14.61 ha
Services Area	0.85 ha
Wheel Lathe & Railway	1.47 ha
	28.14 ha
Development Areas	
Precinct A	13.02 ha
Precinct B	1.49 ha
Precinct C	2.11 ha
Precinct D	2.54 ha
Precinct E	2.34 ha
Precinct F	2.07 ha
Precinct G	0.37 ha
Precinct H	3.58 ha
Precinct I	3.81 ha
Total Developable	**31.33 ha**
Total Warehouse	116,333 sqm
Total Office	8,723 sqm
Total Facility	125,056 sqm



SBA ARCHITECTS

Enfield Intermodal Logistics Centre

Mainline Rd, Strathfield South

Masterplan

0 60 300

1:3000 @ A1
1:6000 @ A3
14 Jan 2020

EILC DA01 (P15)
Job No 17169

NSW Ports in partnership with Goodman

Precinct E Area Schedule

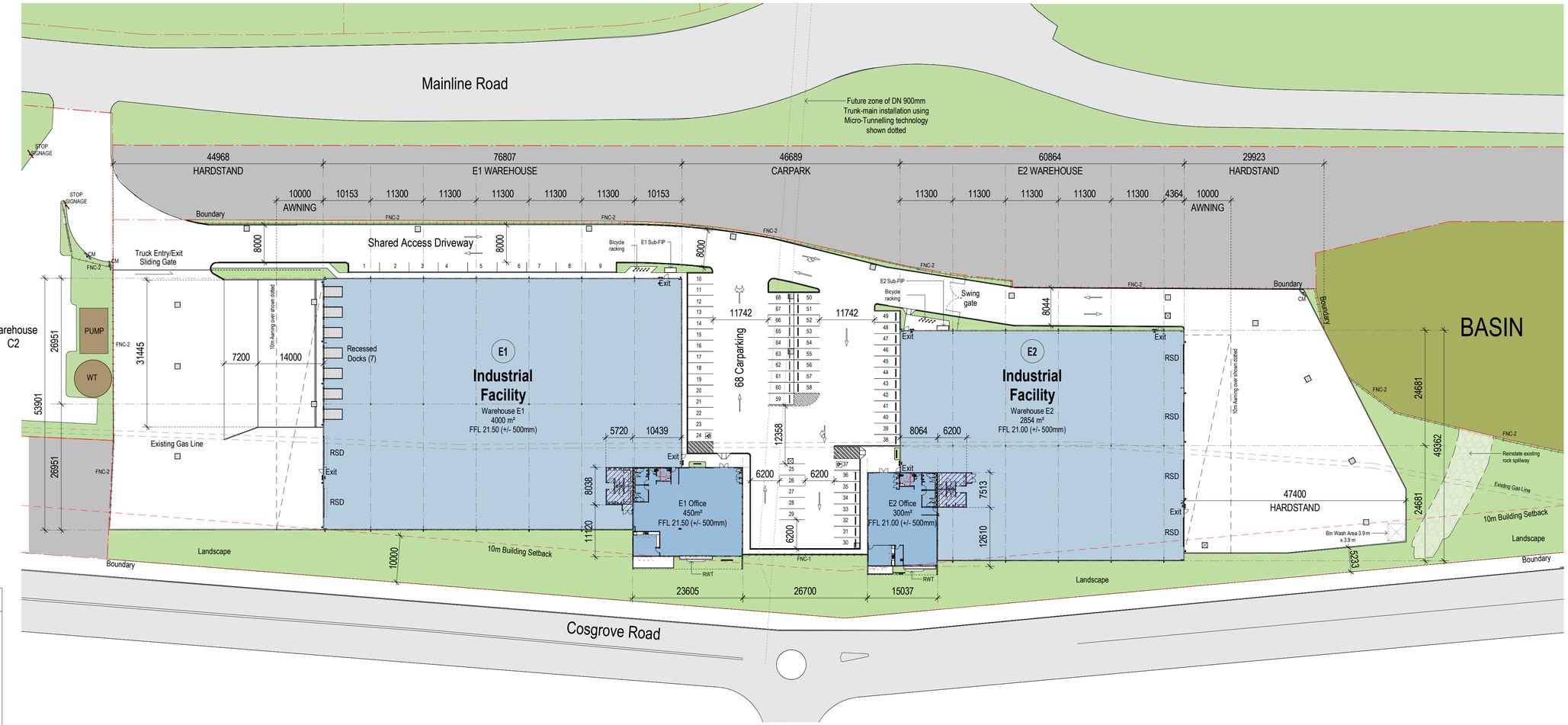
Precinct Site Area	23,440 m² 2.19 ha
Warehouse E1	
Warehouse	4,000 m²
Office E1	450 m²
Total Building Area	4,450 m²
Awning Area	537 m²
Hardstand Area	2,460 m²
Warehouse E2	
Warehouse	2,854m²
Office E2	300 m²
Total Building Area	3,154 m²
Awning Area	468 m²
Hardstand Area	2,192 m²
Total Building Area	7,604 m²
Shared Access Road	2,029 m²
Light duty Areas	2,094m²
Site Cover (exc. awning)	32.5%
Floor Space Ratio	0.32 :1
Landscape Area	6,918m²
Car Spaces	68

Fiout Schedule

- Fitout by tenant
- Base building Modification

SITE LEGEND:

- FNC-1, FENCE TYPE 2/ 1.8m DIPLOMAT BLACK P.C + SPEARTOP
- FNC-2, FENCE TYPE-1/1.8m CHAINMESH BLACK P.C WITH 3 ROWS OF BARDED WIRE
- PEDESTRIAN GATE
- SLIDING GATE
- RW — Retaining Wall
- Site Boundary
- 10m Building Setback
- CM — Convex Mirror



1 PRECINCT 'E' SITE AND FLOOR PLAN

PRELIMINARY

SBA ARCHITECTS | ENFIELD ILC

ENFIELD ILC
MAINLINE RD , STRATHFIELD SOUTH

PRECINCT 'E' SITE & FLOOR PLAN

1:500 @A1
1:1000 @A3
07.01.20

EILC DA 40 (3)

1.2 Construction Environmental Management Plan

1.2.1 Scope

This CEMP has been prepared to satisfy Conditions 6.2 and 6.3 of MP 05_0147. The specific requirements of these Project Approval conditions, along with where these requirements have been addressed within this CEMP, are listed in **Table 1**.

N.B. – In the context of this CEMP, Qanstruct will fulfil the role of the Proponent and will be responsible for its preparation and implementation.

Table 1 CEMP Context

Condition	CEMP Section
Construction Environmental Management Plan **6.2** Prior to the commencement of site preparation works or construction of the project, the Proponent shall prepare and submit for the approval of the Planning Secretary a **Construction Environmental Management Plan** to detail an environmental management framework, practices and procedures to be followed during site preparation and construction of the project. The Plan shall be prepared in accordance with *Guideline for the Preparation of Environmental Management Plans* (DIPNR 2004) and shall include, but not necessarily be limited to:	This report
a) A framework consistent with that presented in Chapter 21 of the document referred to under condition 1.1b) of this approval;	Noted Section 3
b) A description of all activities to be undertaken on site during site establishment and construction of the project including an indication of stages of construction, where relevant;	Sections 1.1 and 2
c) Statutory and other obligations that the Proponent is required to fulfil during site establishment and construction, including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;	Section 3
d) Specific consideration of measures to address any requirements of the EPA during site establishment and construction;	N/A[1]
e) A description of the roles and responsibilities for all relevant employees involved in the site establishment or construction of the project;	Sections 3.1, 3.4, 3.5, 3.6, 4 and 5
f) Details of how the environmental performance of the site preparation and construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the Plan: i) measures to monitor and manage dust emissions; ii) measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and/ or waters during construction activities; and iii) measures to monitor and control noise emissions during construction works;	i) Sections 4.2 and 5.1 ii) Sections 4.8 and 5.1 iii) Sections 4.3 and 5.1
g) A description of the roles and responsibilities for all relevant employees involved in site preparation and construction of the project and a program for how these employees will be trained in responsibilities identified in the plan;	Sections 3.1 and 3.4

[1] Note – no specific directions have been received from EPA regarding the construction and establishment of Precinct E.

Condition	CEMP Section
h) Complaints handling procedures to be applied during operation of the project (conditions 5.2 and condition 5.3 of MP 05_0147);	Section 3.6
i) The issue-specific management plans listed under condition 6.3 of MP 05_0147.	Appendices D to K
The Construction Environmental Management Plan shall be made available for inspection by the public upon request following its approval by the Planning Secretary.	Noted
6.3 As part of the Construction Environmental Management Plan for the project, required under condition 6.2 of MP 05_0147, the Proponent shall prepare and implement the following Management Plans:	
a) A **Construction Noise Management Plan** to outline construction noise mitigation, monitoring and management measures to be implemented to minimise noise impacts during construction of the project. The Plan shall include, but not necessarily be limited to: i) details of construction activities and a schedule for construction works; ii) identification of construction activities that have the potential to generate noise and/ or vibration impacts on surrounding land uses, particularly residential areas; iii) where the relevant construction noise goals contained in the *Noise Management Guideline – Construction Noise* (formerly published as Chapter 171 of the Environmental Noise Control Manual) are predicted to be exceeded at sensitive receivers, provision for the application of all practicable and reasonable noise mitigation measures to seek to achieve the relevant construction noise goals; iv) procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity, as well as procedures for dealing with and responding to noise complaints; and v) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, how the results of this monitoring would be recorded; and, if any non-compliance is detected.	Section 4.2 and Appendix E
b) Construction traffic measures including: i) a **Construction Traffic Management Protocol** to detail how heavy vehicle movements associated with the project will be managed during construction. The Protocol shall specifically address the movement of oversize loads to and from the site, the management of construction traffic, restrictions to the hours of heavy vehicle movements to avoid road use conflicts, and the transport of construction waste materials; and ii) a Driver's Code of Conduct which details traffic management measures to be implemented during construction to: • minimise impacts of the project on the local and regional road network, • minimise conflicts with other road users, • ensure truck drivers use specific routes and access points, including no left turn access from Cosgrove Road, and • minimise traffic noise, particularly during night times hours.	Section 4.4 and Appendix F
c) A **Heritage Interpretation Plan and Strategy** to detail how heritage items to be retain on-site will be protected during site preparation and construction, and how relocated heritage items will be protected and maintained during those works. The Plan shall include a strategy for the ongoing management and interpretation of heritage items and values on the site, and shall be prepared in accordance with OEH (Heritage Division) guidelines;	Section 4.5

Condition	CEMP Section
d) A **Landscape and Ecological Area Management Plan** to detail how the site will be landscaped and maintained. The Plan shall be generally consistent with the Landscape Masterplan presented in the document referred to under condition 1.1b) of this approval and shall include, but not necessarily be limited to: i) provision for the use of locally-endemic native species for landscaping the site; ii) consideration of landscaping locations and densities to maximise visual screening of the project from residential receptors and public open space; iii) measures to maximise the retention of locally-endemic native species existing on the site, and removal of weeds and non-indigenous vegetation; and iv) measures for the enhancement, revegetation and ongoing management of the Ecological Area on the site, including measures to provide suitable habitat for *Litoria Aurea*;	Section 4.6 and Appendix H
e) A **Construction Dust Management Protocol** to detail how dust impacts will be mitigated, monitored and managed during construction of the project. The Plan shall include procedures for the identification of situations in which site preparation or construction works may contribute to an ambient PM_{10} concentration (24-hour) of greater than 50 μgm^{-3} at any off-site residential receptor, with details of measures to be implemented (including alteration or cessation of works, as may be relevant) to prevent or minimise exceedance of this criterion, in so far as the exceedance may relate to activities associated with the project.	Section 4.3 and Appendix D
f) A **Mt Enfield Stabilisation Management Plan** to detail how the batters of Mt Enfield and associated drainage will be managed during construction and until such time as it is stabilised with vegetation. The plan shall include but not be limited to: i) measures to prevent soil erosion and the discharge of sedimentation to lands or waters, including to the Green and Golden Bell Frog Habitat Creation Area and Cox's Creek; ii) identification of where runoff from Mt Enfield is to be directed to, indicating ponding and flow paths to ensure runoff volume and increased flow velocity has been provided for, with the objective of not exceeding current rates; iii) measures to mitigate potential dust impacts on sensitive receivers including the Green and Golden Bell Frog Habitat Creation Area and surrounding residences; and iv) measures for the enhancement, revegetation and ongoing landscape management of the Mt Enfield site, undertaken in consultation with Strathfield Municipal Council and Canterbury Bankstown Council, and the local community.	Noted. The *Mt Enfield Stabilisation Management Plan* has been reviewed and is deemed not applicable as the location of Precinct E are not within the vicinity of Mt Enfield and will therefore cause no impacts.

Condition	CEMP Section
g) **Tarpaulin Factory Area Earthworks Environmental Management Plan** which shall include but not be limited to: i) the measures contained in the letter - Green and Golden Bell Frog Conservation Measures Tarpaulin Shed Site Enfield, prepared by Biosphere Environmental Consultants, 27 November 2016; ii) measures to minimise dust emissions in accordance with conditions 2.22 to 2.27 including measures to mitigate potential dust impacts on Green and Golden Bell Frog habitat; iii) measures to minimise soil erosion in accordance with condition 2.29 and to ensure only clean surface water flows are discharged to the frog ponds; iv) management of stockpiles in accordance with condition 2.30; v) management of waste and remediation of the site in accordance with conditions 2.39 to 2.42, 2.44 and the Remediation Action Plan (RAP), 127 Cosgrove Road, South Strathfield, NSW, Flower Power Group, prepared by ZOIC, February 2017 including air quality monitoring for asbestos; vi) measures to verify that imported material is consistent with that specified in the RAP; vii) landscaping of disturbed areas in accordance with the Landscape and Ecological Area Management Plan under condition 6.3d); viii) protection of heritage items including the relocated Pillar Water Tank; and ix) unexpected finds protocol. A copy of the approved Tarpaulin Factory Area Earthworks Environmental Management Plan is to be provided to Strathfield Municipal Council.	Noted. The Tarpaulin Factory is located in the Southern Precinct and will therefore not be impacted by the construction of Precinct E
h) A **Fill Importation Protocol** (FIP) outlining the requirements of the imported fill, including the source and type, and containing the requirement to place and compact imported material as fill immediately upon arrival to the site. The FIP is to include the requirement that only virgin excavated natural material/excavated natural material can be imported from off-site. All bulk earthworks should be undertaken in accordance with the approved FIP.	Section 4.9 and Appendix J
The **Construction Environmental Management Plan** required under this condition and Condition 6.2 shall be updated (where necessary) to reflect any changes arising from modifications to this approval.	Section 6

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 development;
- Clearly and concisely document the commitments made in the Mod 14 Environmental Assessment (Urbis 2018) and RTS (Goodman 2018), including relevant specialist impact assessments and/or management plans, that are required to be implemented and/or complied with during the construction phase;
- Clearly and concisely document the conditions imposed by MP 05_0147 that are required to be implemented and/or complied with during the construction phase; and
- Assist to establish the development in a manner that avoids (where possible) or minimises impact to the surrounding environment and populace.

This CEMP has been prepared in consideration of the *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources [DIPNR] 2004).

2 Development Description

Construction at Precinct E will include warehouses E1 and E2 situated over two tenancies, along with associated offices and infrastructure such as car parking, hardstand, and landscaping.

Table 2 outlines the size of the site and buildings to be constructed at Precinct E.

Table 2 Precinct E Details

Precinct	Lot / DP	Site Area (ha)	Building Area (m^2)	Building Height (m)
E	Lot 100, DP 1251048	2.19	7,604	13.7

Precinct E encompasses a total of 7,604 m^2 of total building area for two new buildings with the following breakdown of warehouses and offices combined:

- Building E1 – 3,864 m^2; and
- Building E2 – 3,740 m^2.

2.1 Location

The Enfield ILC site is located within the suburb of Strathfield South within the Strathfield Local Government Area (LGA) on the land generally bound by Cosgrove Road to the east, Punchbowl Road to the south, the Enfield Marshalling Yards to the west and Roberts Road to the north.

The Enfield ILC is approximately 15 km from the Sydney Central Business District (CBD) by road and 18 km from Port Botany by rail. It covers an area of approximately 60 hectares (ha) and is approximately 0.5 km in width and over 2 km in length.

2.2 Construction Hours

Construction hours for the Development will be in accordance with Conditions 2.15 to 2.16 of Project Approval MP 05_0147, which are reproduced below:

2.15 The Proponent shall only undertake site preparation and construction activities associated with the project that would generate an audible noise at any residential premises during the following hours:

a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;

b) 8:00 am to 1:00 pm on Saturdays; and

c) At no time on Sundays or public holidays.

This condition does not apply in the event of a direction from police or other relevant authority for safety reasons.

2.16 The hours of site preparation and construction activities specified under Condition 2.15 of this approval may be varied with the prior written approval of the Planning Secretary. Any request to alter the hours of construction specified under Condition 2.15 shall be:

a) Considered on a case-by-case basis;

b) Accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and

c) *Accompanied by sufficient information for the Planning Secretary to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site.*

2.3 Construction Activities and Timing

Construction at Precinct E is proposed to commence in Quarter 4 of 2019 and will take approximately 44 weeks. **Table 3** provides an overview of the construction activities and timeframe for the works.

Table 3 Construction Activities and Timing

Activity	Timeframe
Site Establishment	Early November 2019
Civil Works	November 2019 to February 2020
Structure	February 2020
Roofing / Cladding	March to May 2020
Warehouse Slab / Pavement	April to June 2020
Finishes	May to June 2020
Base Building PC	End of June 2020

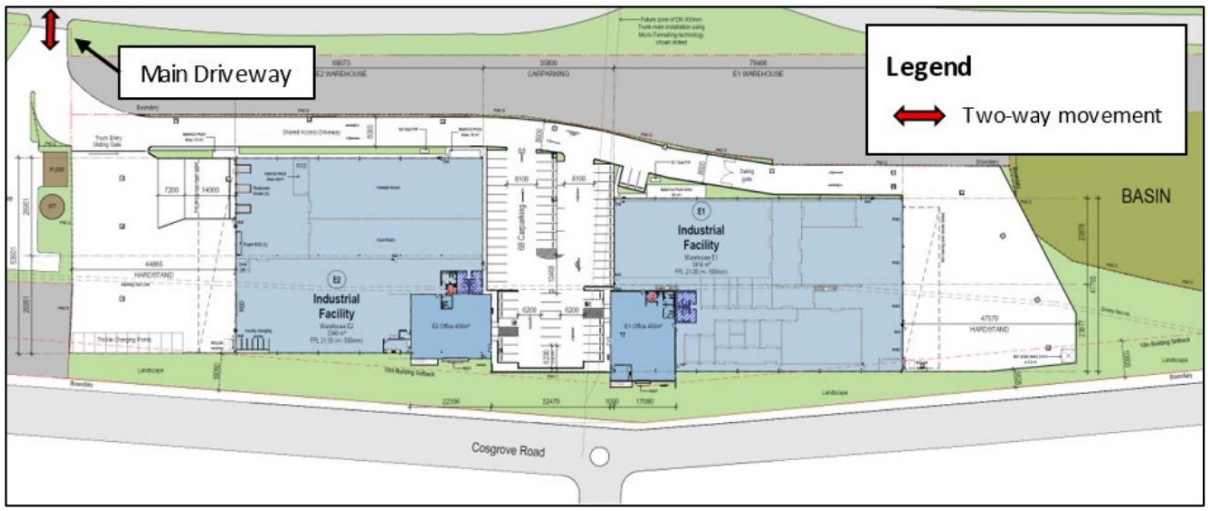
2.4 Construction Site Access

It is anticipated that construction vehicles will utilise the permanent access points, including:

- Construction vehicles related to the works on the hardstand areas will access the Site to/from Mainline Road utilising Gate E-A, as shown in **Figure 3**.
- Construction vehicles related to the works on the car parking areas will access the Site to/from Cosgrave Road utilising Gates E-B and E-C, as shown in **Figure 3**.

The accesses are connected to Cosgrove Road and Mainline Road. It is anticipated that these access points will be constructed prior to commencing works on site.

Figure 3 Precinct E Access Plan



2.5 Construction Contact Details

Table 4 lists the key contacts during the construction of Precinct E.

Table 4 Construction Contact List

Company / Position	Name	Phone Number
Qanstruct's Project Manager	Russell Robinson	0455 965 954
Qanstruct's Director	Josh Horan	0458 397 547
Qanstruct's Site Manager	Ben Forwood	0450 310 561
Qanstruct's Overseeing OHS Manager	Mick Harvey	0417 470 678
Qanstruct's Contract Administrator	Shehryar Khan	0427 432 712
Qanstruct's Contract Administrator	Simon Horan	0402 931 767
Qanstruct's OEHSE Rep / QA	Michael McIntosh	0429 082 902
Qanstruct's Leading Hand	Cameron Dynes	0425 414 566
NSW Ports' Project Manager	Tim Arkell	0417 874 029

3 Environmental Management Framework

3.1 Roles and Responsibilities

The key Qanstruct personnel responsible for environmental management during construction of Precinct E at Enfield ILC are listed in **Table 5**.

Table 5 Personnel Responsible for Environmental Management

Role	Responsibilities
Qanstruct's Project Manager	• Overall responsibility for environmental management and compliance with the Project Approval and relevant legislation; • Coordinate environmental inspections and reporting and authority liaisons; • Record, notify, investigate and respond to any complaints and/or enquiries and, where necessary, develop and implement corrective actions; • Record, notify, investigate and respond to any environmental incidents and, where necessary, develop and implement corrective actions; • 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; and • Report on the performance of the CEMP to senior management for review and as a basis for system improvement.
Qanstruct's Site Manager	• 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; • Participate in workplace inspections; 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.
All employees and contractors	• Ensure familiarity, implementation and compliance with this CEMP and appended management plans; • Support Qanstruct'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 Site Management without delay; and • Report any inappropriate construction practices and/or environmental management practices to Site Management without delay.

3.2 Project Approval

The Development will be constructed in accordance with Project Approval MP 05_0147 and also in accordance with the other documents referenced under Condition 1.1 of the Project Approval including:

- The Mod 14 Environmental Assessment (Urbis 2018) and RTS (Goodman 2018);
- The development layout plans and drawings attached to the Project Approval as Appendix A, which have been sourced from the Environmental Assessment (Urbis 2018); and
- The management plans and mitigation measures (attached to the Project Approval as Appendix B).

If there is any inconsistency between the plans and documentation referred to in Condition 1.1, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of Project Approval MP 05_0147 prevail to the extent of any inconsistency.

A copy of the consolidated Project Approval conditions from MP 05_0147 is contained in **Appendix A**.

3.2.1 Relevant Project Approval Conditions

Project Approval MP 05_0147 imposes a number of environmental performance and management requirements applicable to the construction of Precinct E. These conditions are listed in **Table 6**.

N.B. The administrative conditions and conditions relating to the operational phase have not been included in **Table 6**. Only those conditions specific to site construction have been included. In addition, Conditions 6.2 and 6.3 as they relate to the preparation of this CEMP and sub-plans have been addressed in **Table 1**.

Table 6 Relevant Project Approval Conditions for Environmental Performance and Management

Project Approval MP 05_0147	Comments
1. ADMINISTRATIVE CONDITIONS	
Terms of Approval 1.1 The Proponent shall carry out the project generally in accordance with the: a) Major Projects Application 05_0147; b) *Environmental Assessment: Intermodal Logistics Centre at Enfield*, dated October 2005 and prepared by Sinclair Knight Merz (SKM); c) response to submissions and revised Statement of Commitments detailed in *Intermodal Logistics Centre: Preferred Project Report* prepared by Sinclair Knight Merz Pty Ltd, dated June 2006; d) additional information provided by Sinclair Knight Merz Pty Ltd to the Department titled *Project Changes – Enfield ILC* and dated 14 July 2007; e) additional information provided by Sinclair Knight Merz Pty Ltd to the Department titled *Light Industrial and Commercial Area – Enfield ILC* and dated 6 August 2007; f) letter from Sydney Ports Corporation titled *Project Approval Modification Application Intermodal Logistics Centre at Enfield, Sydney Ports Corporation* (undated) and received 28 August 2008; g) letter from Sydney Ports Corporation titled *Project Approval Modification Application Intermodal Logistics Centre at Enfield, Sydney Ports Corporation* and dated 5 February 2009; h) *Intermodal Logistics Centre at Enfield Modification Application* ILC-E-PT3A REV A , Sydney Ports Corporation and dated 31 August 2009;	Noted

Project Approval MP 05_0147	Comments
i) *Intermodal Logistics Centre at Enfield, Modification Application 05_0147 – Project Adjustments. Response to Stakeholders Submissions* (Revision A), prepared by Sydney Ports Corporation and dated November 2009; j) *Intermodal Logistics Centre at Enfield, Modification Application 05_0147 – Project Adjustments. Supporting Information to Modification Application*, prepared by Sydney Ports Corporation and dated 26 March 2010; k) *Intermodal Logistics Centre at Enfield, Modification Application 05_0147 – On Site Management of Unsuitable Engineering Fill*, prepared by Sydney Ports Corporation and dated May 2011; l) *Intermodal Logistics Centre at Enfield Modification Application No. 5 On Site Management of Unsuitable Engineering Fill Response to Submissions,* prepared by Sydney Ports Corporation and dated August 2011; m) *Intermodal Logistics Centre at Enfield, Modification Application No.6 Early Contractor Involvement Detailed Design Adjustments and Subdivision*, prepared by Sydney Ports and dated April 2012; n) *Intermodal Logistics Centre at Enfield, Modification Application No.6 ECI Detailed Design Adjustments and Subdivision*, prepared by Sydney Ports and dated July 2012; o) *Intermodal Logistics Centre: Enfield Modification Application No 8, Subdivision – Changes and Amendments*, prepared by NSW Ports and dated 2 September 2013; p) *Addendum Assessment Report, Modification No.8 to Major Project MP 05_0147 – Intermodal Logistics Centre (ILC) at Enfield: Subdivision Changes and Amendments*, prepared by NSW Ports and dated 19 September 2013; q) *Environmental Assessment – Modification Application No. 11 – Additional warehouse* prepared by TIA Project group dated September 2016 and supporting information dated 6 December 2016 and 23 December 2016; r) *Environmental assessment – Modification No. 12 – Extension of Existing Rail Sidings and Administration Office Expansion* prepared by TIA Project Group dated November 2016 and supporting Noise Impact Assessment prepared by SLR Consulting dated 3 November 2016; s) *Environmental Assessment – Modification Application No. 13 – 127 Cosgrove Road. South Strathfield*, prepared by LJB Urban Planning dated August 2017; and the associated Remediation Action Plan (RAP), 127 Cosgrove Road, South Strathfield, NSW, Flower Power Group, prepared by ZOIC, February 2017; Green and Golden Bell Frog Conservation Measures Tarpaulin Shed Site Enfield, prepared by Biosphere Environmental Consultants, 27 November 2016; and email titled RE: Enfield Intermodal Logistics Centre MOD 13, prepared by LJB Urban Planning Pty Limited, dated 28 May 2018; t) *Environmental Assessment – Modification No. 14 – Modification of Built Form and operational parameters* prepared by Urbis dated January 2018, and Enfield ILC, Strathfield South MP 05_0147 MOD 14 – Response to Submissions submitted by Goodman on 8 June 2018; and u) the conditions of this approval	Noted
1.2 In the event of an inconsistency between: a) the conditions of this approval and any document listed from condition 1.1a) to 1.1t) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and b) any of the documents listed from condition 1.1a) to 1.1t) inclusive, the most recent document shall prevail to the extent of the inconsistency.	Section 4.1

<table>
<tr><th>Project Approval MP 05_0147</th><th>Comments</th></tr>
<tr><td>1.3 The Contractor/ Manager 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 approval; and
b) the implementation of any actions or measures contained in these reports, plans or correspondence.</td><td>No additional requirements have been received from DPIE.</td></tr>
<tr><td>Limits of Approval
1.4 This approval shall lapse five years after the date on which it is granted, unless the works the subject of this approval are physically and substantially commenced on or before that time.</td><td>Noted</td></tr>
<tr><td>Warehousing and Distribution
1.6 The Proponent is permitted to construct and operate warehouses across six precincts (A, C to F and H) associated with the project, generally in accordance with the documents referred to under condition 1.1t). Warehouses are permitted to be used for freight handling, packing/re-packing, storage and distribution, and for activities ancillary to these uses. Each warehouse shall not exceed a height of 13.7 metres at its highest point (excluding minor ancillary structures such as communications equipment, air conditioning units, or solar panelling), and shall be limited to a footprint no greater than the relevant area specified in Table 1 below.
Table 1 - Maximum Building Area (per precinct)
<table>
<tr><th>Precinct</th><th>Maximum Footprint (m^2)</th></tr>
<tr><td>A</td><td>62,600</td></tr>
<tr><td>C</td><td>10,487</td></tr>
<tr><td>D</td><td>11,460</td></tr>
<tr><td>E</td><td>7,604</td></tr>
<tr><td>F</td><td>9,620</td></tr>
<tr><td>H</td><td>16,475</td></tr>
</table></td><td>Noted for Precinct E</td></tr>
<tr><td>Statutory Requirements
1.12 The Proponent shall ensure that all licences, permits and approvals are obtained and kept up-to-date as required throughout the life of the development. No condition of this consent removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals. The Proponent shall ensure that a copy of this approval and all relevant environmental approvals are available on the site at all times during the project.</td><td>Section 4.1</td></tr>
<tr><td>Subdivision and Easements
1.18 Easements for services, drainage, maintenance or any other encumbrances and indemnities required for joint or reciprocal use of part or all of the proposed lots as a consequence of the subdivision of the site, shall be created over those lots pursuant to the Conveyancing Act 1919.</td><td>Noted</td></tr>
<tr><td colspan="2">2. SPECIFIC ENVIRONMENTAL CONDITIONS</td></tr>
<tr><td>Traffic and Transport Impacts
2.1 The Proponent shall provide a shuttle bus service between Strathfield train station and the site during peak construction works, and shall encourage construction employees to utilise public transport rather than private transport to the site.</td><td>This condition has been completed and closed in accordance with the Compliance Tracking Report No. 10 (April - Oct 2017), approved by the DPIE on the 9 January 2018.</td></tr>
</table>

Project Approval MP 05_0147	Comments
2.2 The Proponent shall provide a manual and/or technological solution to control the frequency of articulated and B-double vehicles utilising the Cosgrove Road entrance to the site during morning and afternoon peak periods	This condition has been completed and closed in accordance with the *Compliance Tracking Report No. 10* (April - Oct 2017), approved by the DPIE on the 9 January 2018.
2.6A Before the commencement of construction of any warehouse (that shares a boundary with public infrastructure) permitted as part of the approval of MP 05_0147 MOD 14, the Applicant must: a) consult with the applicable authority 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 that shares a boundary with the site (including roads, gutters and footpaths); and c) submit a copy of the dilapidation report to the Planning Secretary and Council.	Noted – dilapidation surveys have been contracted and will be conducted as required prior to the commencement of construction.
Coordination and Management of Transport Issues 2.12 The Proponent shall establish and maintain for the life of the project, unless otherwise agreed by the Planning Secretary, a Road Transport Coordination Group to oversee and coordinate the management of traffic and road issues associated with and affected by the project. The Group shall include representatives of the Proponent, the Department, the RMS, Strathfield Municipal Council and Canterbury Bankstown Council, and shall operate in accordance with terms of reference agreed by those parties at the first meeting(s) of the Group. The Proponent shall bear the full cost of administering the Group.	Section 4.4
Noise Impacts 2.13 The Proponent shall minimise noise emissions from plant and equipment operated on the site by installing and maintaining, wherever practicable, efficient silencers, low-noise mufflers (residential standard) and by replacing reversing alarms with alternative silent measures, such as flashing lights (subject to occupational health and safety requirements).	Section 4.3
Construction Noise 2.14 The Proponent shall, as soon as practicable during site preparation, and prior to the commencement of construction of rail trackwork and hardstand for the intermodal terminal, empty container and warehousing components of the project, install earth mound noise barriers in the south east of the site, as generally described in the documents referred to under condition 1.1 of this approval.	Complete
2.15 The Proponent shall only undertake site preparation and construction activities associated with the project that would generate an audible noise at any residential premises during the following hours: a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive; b) 8:00 am to 1:00 pm on Saturdays; and c) at no time on Sundays or public holidays. This condition does not apply in the event of a direction from police or other relevant authority for safety reasons.	Section 2.2

Project Approval MP 05_0147	Comments
2.16 The hours of site preparation and construction activities specified under condition 2.15 of this approval may be varied with the prior written approval of the Planning Secretary. Any request to alter the hours of construction specified under condition 2.15 shall be: a) considered on a case-by-case basis; b) accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and c) accompanied by sufficient information for the Planning Secretary to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site.	Noted
Air Quality Impacts 2.20 The Proponent shall install, operate and maintain a meteorological monitoring station to monitor weather conditions representative of those on the site, in accordance with: a) AM-1 Guide to Siting of Sampling Units (AS 2922-1987); b) AM-2 Guide for Horizontal Measurement of Wind for Air Quality Applications (AS 2923- 1987); and c) AM-4 On-Site Meteorological Monitoring Program Guidance for Regulatory Modelling Applications. The Proponent shall install the meteorological monitoring station prior to the commencement of site preparation or construction works and shall use the station to undertake the monitoring required under condition 3.1 of this approval, until all large exposed areas have either been landscaped or sealed. This condition does not preclude the Proponent from reaching agreement with any other relevant party for the installation, operation and maintenance of a shared monitoring station, provided the outcomes of this condition are achieved. During periods of repair or maintenance of the meteorological monitoring station, the Proponent may utilise weather data collected at the Canterbury Racecourse Automatic Weather Station, operated by the Bureau of Meteorology, or other nearby Bureau of Meteorology Stations in the event that the Canterbury station is offline.	This condition has been completed and closed in accordance with the *Compliance Tracking Report No. 10* (April - Oct 2017), approved by the DPIE on the 9 January 2018. Qanstruct will undertake daily reviews of the Bureau of Meteorology (BOM) weather forecasts to manage site controls i.e. stormwater management, dust control etc. in accordance with the CDMP
Odour 2.21 The Proponent shall not permit any offensive odour, as defined under section 129 of the *Protection of the Environment Operations Act 1997*, to be emitted beyond the boundary of land owned by the Proponent (the site the subject of this approval).	Section 4.2
Dust Emissions 2.22 The Proponent shall design, construct, commission, operate and maintain the project in a manner that minimises or prevents the emission of dust from the site including windblown and traffic generated dust.	Section 4.2
2.23 The Proponent shall take all practicable measures to ensure that all vehicles entering or leaving the site, carrying a load that may generate dust, are covered at all times, except during loading and unloading. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times, to the extent practicable.	Section 4.2
2.24 All activities on the site shall be undertaken with the objective of preventing visible emissions of dust beyond the boundary of the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.	Section 4.2

Project Approval MP 05_0147	Comments
2.25 The Proponent shall manage, maintain and use internal haulage roads in order to prevent dust emissions. The measures to be implemented for the management of potential dust emissions from internal roads during construction shall be incorporated in the Construction Environmental Management Plan required under condition 6.3.	All roads are sealed within the Enfield ILC
2.26 The Proponent shall apply and enforce a 25 km/ h speed limit on the site during site preparation and construction works to minimise the potential for dust generation.	Section 4.2
2.27 The Proponent shall ensure that all vehicles and equipment directly associated with site preparation and construction works (as distinct from passenger vehicles) pass through a wheel wash prior to leaving the site.	Section 4.2
Water Quality and Hydrological Impacts 2.28 Except as may be expressively provided under an Environment Protection Licence applicable to the project, the Proponent shall comply with section 120 of the *Protection of the Environment Operations Act 1997* which prohibits the pollution of waters.	Noted
2.29 Soil and water management controls shall be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during site preparation and construction activities, in accordance with Landcom's *Managing Urban Stormwater: Soils and Construction*.	Section 4.8
2.30 All stockpiled construction materials shall be adequately located, stabilised and maintained to prevent erosion or dispersal of the materials.	Sections 4.8 and 4.9
2.31 The Proponent shall construct and maintain stormwater detention basins on the site, generally consistent with the basin sizes/ locations presented in the document referred to under conditions 1.1m) and 1.1n) of this approval. Opportunities to reuse stormwater from detention basins for ecological areas or for site operations shall be investigated during detailed design of the project, and where practicable, the Proponent shall utilise collected water preferentially to external potable water supplies for operational activities on the site, subject to testing to confirm the suitability of collected water quality.	Section 4.8
2.32 All quarantine and machinery wash down waters and amenities wastewater shall be directed to sewer (subject to Sydney Water Corporation approval), or to an appropriately licensed liquid waste disposal facility.	Section 4.8 CDSMP Section 13.8 There will be minimal water generated by the construction of Precinct E. All machinery washdown water will be captured in the wheel wash system and treated through geotextile fabric. Accumulated soil and aggregate will either be placed beneath the cap or disposed of as special waste, asbestos waste to an appropriately licenced facility following waste classification sampling.
2.33 The Proponent shall design, install, maintain and operate rainwater tanks for the collection of water for domestic uses on the site. Collected rainwater shall be used preferentially to external potable water supplies.	Section 4.8

Project Approval MP 05_0147	Comments
Heritage Impacts and Management 2.34 Except for necessary stabilisation works agreed in consultation with the OEH (Heritage Division), the Proponent is not permitted to destroy, modify or otherwise physically affect the Tarpaulin Factory as part of this approval. Any proposal to destroy, modify, redevelop, relocate or otherwise physically affect the Tarpaulin Factory, except for agreed stabilisation works, shall be the subject of further assessment and approval in accordance with the *Environmental Planning and Assessment Act 1979*.	The Tarpaulin Factory is located in the Southern Precinct and will therefore not be impacted by the construction of Precinct E.
2.35 The Proponent shall relocate and maintain the Pillar Water Tank to an appropriate location within the site, determined in consultation with the OEH (Heritage Division).	The Pillar Water Tank has been relocated to the Southern Precinct and will therefore not be impacted by the construction of Precinct E. This condition has been completed and closed in accordance with the *Compliance Tracking Report No. 10* (April - Oct 2017), approved by the DPIE on the 9 January 2018.
Waste Generation and Management 2.39 All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.	Section 4.6
2.40 The Proponent shall ensure that all liquid and/ or non-liquid waste generated, stored on the site or disposed of, is assessed and classified in accordance with the *Waste Classification Guidelines* (EPA, 2014).	Section 4.6
2.41 The Proponent shall ensure that the transport of any hazardous and/ or industrial and/or Group A waste from the site is conducted strictly in accordance with any requirements that may be specified by the EPA in relation to the transport of those wastes.	Sections 4.6 and 4.10
2.42 The Proponent shall ensure that contaminated areas of the site that are disturbed by construction works associated with the project are remediated prior to the commencement of project operations at these areas. All remediation works shall be undertaken in accordance with the requirements of *the Contaminated Land Management Act 1997* and *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (EPA, 1997).	Section 4.8
2.43 Prior to the commencement of construction works associated with the project that may disturb contaminated areas of the site, the Proponent shall submit to Planning Secretary a Site Audit Statement(s), prepared by an accredited Site Auditor under the *Contaminated Land Management Act 1997*, verifying that the area of the site on which construction is to be undertaken has been or can be remediated to a standard consistent with the intended land use. A final Site Audit Statement(s), prepared by an accredited Site Auditor, certifying that the contaminated areas have been remediated to a standard consistent with the intended land use and including any associated long term environmental management plan (LTEMP) is to be submitted to the Planning Secretary prior to operation of the remediated site(s).	Section 4.8

Project Approval MP 05_0147	Comments
2.44 The Proponent shall manage any asbestos or asbestos-contaminated materials that may be uncovered during the construction, commissioning and operation of the project strictly in accordance with the requirements under *Protection of the Environment Operations (Waste) Regulation 2014* and any guidelines or requirements issued by the EPA in relation to those materials.	Section 4.8
Visual Amenity and Urban Design 2.45 The Proponent shall ensure that all structures on the site are designed, constructed and maintained to maximise, where practicable, the use of natural ventilation and natural lighting, and to minimise energy consumption associated with heating, cooling and lighting.	Section 4.1
2.46 The Proponent shall ensure that all external lighting installed as part of the project is mounted, screened, and directed in such a manner so as not to create a nuisance to surrounding land uses. The lighting shall be the minimum level of illumination necessary, and be in general accordance with the latest version of *AS 4282 – 1997 Control of the Obtrusive Effects of Outdoor Lighting.*	Section 4.1
Ecological Impacts 2.48 The Proponent shall implement all of the relevant actions for the site recommended in the *Management Plan for the Green and Golden Bell Frog Key Population at Greenacre* (DECC, May 2007), being: a) creation of overwintering habitat as part of the two-hectare improved foraging habitat at the southern end of the site; b) provision of linkages to the former RailCorp ponds; and c) restrictions on the use of herbicides in known frog habitat and attainment of water quality standards for water discharged from the site. These actions shall be incorporated within both the Construction Environmental Management Plan (refer to condition 6.2) and the Operation Environmental Management Plan (refer to condition 6.4) as relevant, including provisions for monitoring the outcomes of these actions and periodically reporting outcomes to the OEH at a frequency agreed with the OEH.	As advised by NSW Ports, this condition is only required for construction works at Precinct A.

Project Approval MP 05_0147	Comments
2.48A The Proponent shall implement the mitigation measures identified in Section 7.1 of the *ILC at Enfield Impact Assessment on Green and Golden Bell Frogs: Addition of Fill Material to Mt Enfield* (Biosphere Environmental Consultants Pty Ltd, 2011), the supplementary letter of advice dated 10 January 2018 (Biosphere Consultants Pty Ltd, 2018), and the following: a) the installation of an exclusion fence to help prevent frogs from entering the construction site; b) the installation of silt fences and silt trapping devices prior to any earthworks, and the use of dust suppression methods throughout construction, to prevent wind-blown dust from entering the frog habitat area; c) the establishment of run-off barriers between the construction areas and the frog habitat area, to prevent accidental spills and/or stormwater waste from entering the frog habitat area; d) the installation of visual screens to minimise light spill into the frog habitat area, from night construction works; e) the demarcation of the frog habitat area as a "no go" area, using barrier bunting and signs that indicate the significance of the area and that the site is off limits to people, machinery and plant equipment; f) the installation of an exclusion fence to help prevent frogs from entering the operational areas; g) the installation of diversion bunds to ensure hazardous liquids can never enter the frog habitat area; and h) the installation of visual screens to minimise light spill into the frog habitat area, from trucks and plant equipment operating throughout the night. These actions shall be incorporated within the Construction Environmental Management Plan (condition 6.2 of this approval) and the Operation Environment Management Plan (condition 6.4 of this approval), as relevant.	As advised by NSW Ports, this condition is only required for construction works at Precinct A.
Hazards, Risk and Land Use Safety 2.49 All demolition work shall be carried out in accordance with *AS 2601-2001 The Demolition of Structures*.	There will be no demolition at Precinct E.
2.50 The Proponent shall store and handle all dangerous goods (not being unopened, containerised goods), as defined by the Australian Dangerous Goods Code, strictly in accordance with: a) all relevant Australian Standards; and b) *Work Health and Safety Regulation 2017*. In the event of an inconsistency between the requirements listed from a) to c) above, the most stringent requirement shall prevail to the extent of the inconsistency.	Section 4.10
2.51 The Proponent shall investigate, in consultation with relevant emergency services, whether additional measures are required along Cosgrove Road, including parking restrictions, to ensure clear and safe access to the site in the event of an emergency.	Consultation with emergency services was undertaken in July 2013.

<table>
<tr><th>Project Approval MP 05_0147</th><th>Comments</th></tr>
<tr><td colspan="2">3. ENVIRONMENTAL MONITORING AND AUDITING</td></tr>
<tr><td>Meteorological Monitoring
3.1 From the commencement of site preparation and construction works associated with the project, the Proponent shall continuously monitor, utilising the meteorological monitoring station referred to under condition 2.20 of this approval, each of the parameters listed in Table 4, utilising the sampling method indicated and applying a 15-minute average period to all results, and recording data in units specified in the Table.
Table 4 – Meteorological Monitoring
<table>
<tr><th>Parameter</th><th>Units of Measure</th><th>Sampling Method*</th><th>Method</th></tr>
<tr><td>Temperature at two metres</td><td>°C</td><td>AM-4</td><td>USEPA (2000) EPA 454/ R-99-005</td></tr>
<tr><td>Temperature at ten metres</td><td>°C</td><td>AM-4</td><td>USEPA (2000) EPA 454/ R-99-005</td></tr>
<tr><td>Wind speed at ten metres</td><td>ms^{-1}</td><td>AM-2 and AM-4</td><td>AS 2923-1987; USEPA (2000) EPA 454/R-99-005</td></tr>
<tr><td>Wind direction at ten metres</td><td>°</td><td>AM-2 and AM-4</td><td>AS 2923-1987; USEPA (2000) EPA 454/R-99-005</td></tr>
<tr><td>Solar radiation</td><td>Wm^{-2}</td><td>AM-4</td><td>USEPA (2000) EPA 454/ R-99-005</td></tr>
</table>
refer Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA, 2005)
During periods of repair or maintenance of the meteorological monitoring station, the Proponent may utilise weather data collected at the Canterbury Racecourse Automatic Weather Station, operated by the Bureau of Meteorology, or other nearby Bureau of Meteorology Stations in the event that the Canterbury station is offline.</td><td>This condition has been completed and closed in accordance with the Compliance Tracking Report No. 10 (April - Oct 2017), approved by the DPIE on the 9 January 2018.
Qanstruct will undertake daily reviews of the Bureau of Meteorology (BOM) weather forecasts to manage site controls i.e. stormwater management, dust control etc.</td></tr>
<tr><td>Construction Dust Monitoring
3.2 The Proponent shall, from the commencement of soil disturbing works on the site until all large exposed areas have either been landscaped or sealed, continuously monitor ambient dust concentrations (PM_{10}) at two of the most-affected residential receptor(s) to the site (with monitoring undertaken either on the boundary of the site or within the affected residential areas) employing the sampling and analysis methods specified under AM-18 or AS3580.9.8 or as otherwise agreed by the Planning Secretary. Results of dust monitoring shall be recorded in μgm^{-3} and shall be utilised for the purpose of site preparation and construction dust management under condition 6.3(e) of this approval.</td><td>Section 4.2</td></tr>
<tr><td colspan="2">4. COMPLIANCE MONITORING AND TRACKING</td></tr>
<tr><td>Compliance Tracking Program
4.1 The Proponent shall develop and implement a Compliance Tracking Program to track compliance with the requirements of this approval. The Program shall include, but not necessarily limited to:
a) provisions for periodic review of the compliance status of the project against the requirements of this approval;
b) provisions for periodic reporting of compliance status to the Planning Secretary;
c) a program for independent environmental auditing at least annually, or as otherwise agreed by the Planning Secretary, in accordance with ISO 19011:2002 - Guidelines for Quality and/ or Environmental Management Systems Auditing; and
d) mechanisms for rectifying any non-compliance identified during environmental auditing or review of compliance.</td><td>Sections 4.1 and 5.2</td></tr>
</table>

Project Approval MP 05_0147	Comments
5. COMMUNITY INFORMATION, CONSULTATION AND INVOLVEMENT	
5.1 Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.	Section 4.1
Complaints and Enquiries Procedure 5.2 Prior to the commencement of construction of the project, the Proponent shall ensure that the following are available for community complaints and enquiries for the life of the project (including construction and operation): a) a telephone number on which complaints and enquiries about construction and operational activities at the site may be registered; b) a postal address to which written complaints and enquires may be sent; and c) an email address to which electronic complaints and enquiries may be transmitted. The telephone number, the postal address and the email address shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public, and which clearly indicates the purposes of the sign. This information is also to be provided on the Proponent's website.	Section 4.1
5.3 The Proponent shall record details of all complaints received through the means listed under condition 5.2 of this approval in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to: a) the date and time, where relevant, of the complaint; b) the means by which the complaint was made (telephone, mail or email); c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect; d) the nature of the complaint; e) record of operational and meteorological condition contributing to the complaint; f) any action(s) taken by the Proponent in relation to the complaint, including any follow- up contact with the complainant; and g) if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken. The Complaints Register shall be made available for inspection by the Planning Secretary upon request.	Sections 4.1 and 5.1
Provision of Electronic Information 5.4 The Proponent shall establish and maintain a new website, or dedicated pages within its existing website for the provision of electronic information associated with the project. The Proponent shall publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to: a) a copy of the documents referred to under condition 1.1 of this approval, and any documentation supporting modifications to this approval that may be granted from time to time; b) a copy of this approval and each relevant environmental approval, licence or permit required and obtained in relation to the project; c) a copy of each strategy, plan, program and audit required under this approval; and d) the outcomes of compliance tracking in accordance with condition 4.1 of this approval.	Sections 4.1 and 5.2

Project Approval MP 05_0147	Comments
7. ENVIRONMENTAL REPORTING	
Incident Reporting 7.1 The Proponent shall notify the Planning Secretary of any incident with actual or potential significant off-site impacts on people or the biophysical environment as soon as practicable after the occurrence of the incident. The Proponent shall provide written details of the incident to the Planning Secretary within seven days of the date on which the incident occurred.	Section 5.2
7.2 The Proponent shall maintain a register of accidents, incidents and potential incidents with actual or potential significant off-Site impacts on people or the biophysical environment. The register shall be made available for inspection at any time by the independent qualified person or team conducting the Environmental Audit and/or the Planning Secretary.	Section 5.2
7.3 The Proponent shall meet the requirements of the Planning Secretary to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition 7.1 of this consent, within such period as the Planning Secretary may agree.	Section 5.2

3.3 Community Consultation and Enquiries

NSW Ports undertake regular community consultation which includes:

- Quarterly meetings of the Enfield Community Liaison Committee (CLC);
- Regular resident updates i.e. a letterbox drop of information to targeted residents; and
- Ongoing communication of the project contact details for complaints and enquiries including site signage, website and hard copy material.

As required by Condition 5.2 of MP 05_0147, a clearly visible sign will be installed at the site access prior to commencing construction. Relevant contact details for Qanstruct and NSW Ports, including a phone number, postal address and email for community enquiries, will be included on site signage. All community enquiries received by Qanstruct will be forwarded to NSW Ports. Complaints response will be coordinated through NSW Ports.

3.4 Inductions and Environmental Training

The Project Manager will ensure that all employees and contractors involved in the construction of the development 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 and then on an ongoing basis through “toolbox talks” (or similar).

The topics to be covered during the induction and toolbox talks include:

- General site maintenance and management expectations and requirements;
- Familiarisation with site environmental controls;
- The location of environmentally sensitive areas at Enfield ILC;
- Hazard identification;
- The environmental management commitments and responsibilities in this CEMP;

- Waste avoidance and management strategies;
- Appropriate response and management of environmental incidents (for example, a chemical spill) in accordance with the protocol in **Section 3.5**; and
- Appropriate response and management of complaints received from the public, government agencies or other stakeholders in accordance with the protocol in **Section 3.6**.

Records of all training undertaken will be recorded and maintained in an Environmental Training Register to maintain consistency and for audit purposes.

3.5 Environmental Incident Management

For the purposes of this CEMP, an "environmental incident" is described as any event that causes or has the potential to cause material harm to the environment. MP 05_0147 requires an incident register of all accidents, incidents, and potential incidents with actual or potential significant off-site impacts to people or the biophysical environment, which is outlined in **Section 3.5.5**.

3.5.1 Performance Objective

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

3.5.2 Responsibility

Qanstruct's Project Manager and NSW Ports are responsible for ensuring that the appropriate management response and handling procedures are instigated and carried through in the event of an environmental incident. All employees and contractors are to:

- Notify the Project Manager of any hazard or potential hazard that may result in an environmental incident, regardless of the nature or scale. The Project Manager will then notify NSW Ports;
- Take immediate action to notify the Project Manager of any environmental incident; 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.

The induction and toolbox talks outlined in **Section 3.4** should be used to ensure all site employees and contractors are aware of and understand their obligations for incident response.

3.5.3 Notification Requirements

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 addition, Clause 7.1 of Schedule 2 of Project Approval 05_0147 requires DPIE to be notified of any incident with actual or potential off-site impacts.

In summary, notification requirements for the project are broadly categorised as:

Duty of an employee or any person undertaking an activity

Any person engaged as an employee or undertaking an activity at Precinct E must, immediately after becoming aware of any potential incident (even if outside of normal business hours), notify Qanstruct's Project Manager of the incident and all relevant information about it. The 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 Project Manager) on which the incident occurred, who is notified (or otherwise becomes aware of) of the incident, must immediately notify the relevant authorities and NSW Ports about the incident and provide all relevant information.

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

- The appropriate regulatory authority/first response agency (where relevant 000 / NSW Police / Ambulance / Fire and Rescue NSW);
- The Environment Protection Authority (EPA) (if they are the appropriate regulatory authority);
- The Local Council (i.e. Strathfield Municipal Council);
- Public Health Unit;
- SafeWork NSW; and
- Fire and Rescue NSW (if not notified under first response).

Table 7 lists the contact details for these authorities. The person reporting the pollution incident should 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 Details for Environmental Incidents

Regulatory Authority / Stakeholder	Key Contact	Contact Details	
Department of Planning, Industry and Environment (DPIE)	Compliance unit	1300 305 695 Email: compliance@plannning.nsw.gov.au	
Environment Protection Authority (EPA)	Environment Line	131 555 Email: info@environment.nsw.gov.au	
	Head office (Sydney)	02 9995 5000	
Strathfield Municipal Council	Main switchboard	02 9748 9999 Email: council@strathfield.nsw.gov.au	
NSW Health	NSW Ministry of Health (Sydney)	02 9391 9000	
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 Fire and Rescue NSW NSW Ambulance Service	131 444 1300 729 579 -	In case of emergency 000
Water NSW	Incident Notification Number	1800 061 069	
NSW Ports Project Manager	Tim Arkell	0417 874 029	

In accordance with Condition 7.1 of Project Approval MP 05_0147, NSW Ports will notify DPIE of any incident with actual or potential significant off-site impacts on people or the biophysical environment as soon as practicable after the occurrence of the incident. NSW Ports will provide a detailed report to DPIE within seven days of the incident. All consultation with the DPIE will be undertaken by NSW Ports. Qanstruct will liaise with the EPA and other regulatory agencies under the POEO Act as required.

3.5.4 Handling Procedure

Upon becoming aware of an environmental incident, the procedure outlined below must be followed.

1. **Preventative Action**

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

   In the unlikely event that an incident 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 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 must be strictly adhered to.

4. **Investigate**

   Undertake immediate investigative work to determine the cause of the emergency.

5. **Remedial Action**

   Undertake appropriate remedial action to address the cause of the incident or emergency 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 environmental incident is to be recorded in an *Incident and Hazard Report Form*, which attached as **Appendix B**. A copy of the completed report should be provided to NSW Ports and be maintained for at least four years.

   Condition 7.1 of Project Approval MP 05_0147 requires that the DPIE be provided with a detailed report within seven days of an incident which will be coordinated through NSW Ports.

7. **Preventative Action**

   Once the incident or emergency has been suitably handled, appropriate measures will be identified and implemented to negate the possibility of re-occurrence.

3.5.5 Incidents Register

In accordance with Condition 7.2 of Project Approval MP 05_0147, a register must be maintained for the Development. The register should contain the following:

- A record of all accidents, incidents and potential incidents with actual or potential significant off-site impacts on people or the biophysical environment;
- A copy of the environmental incident notification requirements and complaints handling procedure and register contained above in **Section 3.5.3** and **3.6**;
- Site evacuation procedures;
- A separate reference sheet containing the contact details for Project Manager, NSW Ports and the contact details for the regulatory authorities listed above in **Table 7**;
- Blank hard copies of the *Incident and Hazard Report Form*; and
- Copies of all completed *Incident and Hazard Report Forms*, which are to be maintained on-site for at least four years after the event to which they relate.

3.6 Environmental Complaint Management

3.6.1 Performance Objective

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

3.6.2 Responsibility

The Project Manager in conjunction with NSW Ports are 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** should be used to ensure all site employees and contractors are aware of and understand their obligations for incident response.

All employees and contractors who take receipt of a complaint, either verbal or written, are to immediately notify the Project Manager, who will then contact NSW Ports.

3.6.3 Handling Procedure

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

1. **Receive**

   In the normal course of events, the first contact for complaints will usually be made in person or by telephone/email to NSW Ports who will pass the details of the complaint onto Qanstruct. Should Qanstruct staff directly receive a verbal complaint, a formal written *Complaint Form* (see **Appendix C**) will be requested.

   The information captured in the *Complaint Form* will include:

   - Date and time of the contact or complaint;
   - Means by which the contact or complaint was made (telephone, mail or email);
   - Any personal details of the individual who provided the information or complaint, or if no details were provided, a note to that effect;
   - The nature of the comment or complaint;
   - Record of operational and meteorological condition contributing to the comment or complaint;
   - Any action(s) taken in relation to the comment or complaint; including any follow-up contact with the individual who provided the information or complaint; and
   - If no action was taken in relation to the comment or complaint, the reason(s) why no action was taken.

   All staff members (employees and contractors) who take receipt of a complaint, either verbal or written, are to immediately notify the Project Manager who will then notify NSW Ports. The Project Manager/NSW Ports 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 7**.

2. **Investigate**

   A field investigation should be initiated in an attempt to establish the legitimacy of the complaint and the cause of the problem. Any monitoring information and/or records at and around the time of the complaint should 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 **3.6.3** respectively should be followed.

3. **Remedial Action**

   Once the legitimacy and cause of the complaint has been established, every possible effort must be made to undertake appropriate remedial action(s) to fix the cause of the complaint and mitigate any further impact.

4. **Inform**

   The investigative work and remedial action should be reported back to the complainant and, if necessary, the relevant authorities.

5. **Record**

   It is imperative that an honest 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 Form*. A copy of the completed *Complaint Form* should be maintained for at least four years. The *Complaint Form* must also be recorded in the Complaints Register as per **Section 3.6.4**.

6. **Preventative Action**

   Once the complaint has been suitably handled, appropriate measures should be identified and implemented to negate the possibility of re-occurrence.

3.6.4 Complaints Register

A Complaints Register is to be maintained for Precinct E. The Register should 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 above in **Table 7**;
- Blank hard copies of the *Complaint Form*; and
- Copies of all completed *Complaint Forms*, which are to be maintained on-site for at least four years after the event to which they relate.

4 Environmental Management Commitments

Environmental aspects with the potential to be impacted by construction activities at Precinct E of Enfield ILC are addressed in the following sub-sections. These issues have specific regulatory requirements imposed by Project Approval MP 05_0147 and/or are considered to have the highest potential to result in a non-compliance with a legislative requirement or generate community complaints.

N.B. Where the responsibility is listed as 'Management', this refers to Qanstruct.

4.1 General

Table 8 lists the general environmental controls that will be implemented throughout the construction phase of the development 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
All licences, permits and approvals will be obtained and kept up-to-date as required throughout the life of the development. No condition of this consent removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals. A copy of this approval and all relevant environmental approvals will be available on the site at all times during the project.	Management	Ongoing	MP 05_0147 Condition 1.12
Construction activities will be undertaken within the hours specified in Condition 2.15 of MP 05_0147 (see **Section 2.2**).			MP 05_0147 Condition 2.15
All structures on the site are designed, constructed and maintained to maximise, where practicable, the use of natural ventilation and natural lighting, and to minimise energy consumption associated with heating, cooling and lighting.			MP 05_0147 Condition 2.45
All external lighting will be mounted, screened, and directed in such a manner so as not to create a nuisance to surrounding land uses. The lighting shall be the minimum level of illumination necessary, and be in general accordance with the latest version of *AS 4282 – 1997 Control of the Obtrusive Effects of Outdoor Lighting*.			MP 05_0147 Condition 2.46
Compliance with the requirements of MP 05_0147 will be documented and maintained.			MP 05_0147 Condition 4.1
Subject to confidentiality, all documents required under MP 05_0147 will be made available for public inspection on request.		On request	MP 05_0147 Condition 5.1

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
The following will be made available for community complaints and enquiries: a) a telephone number; b) a postal address; and c) an email address. The telephone number, the postal address and the email address will be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public, and which clearly indicates the purposes of the sign. This information will also be available on the Qanstruct and NSW Ports websites.	Management / Contractors	Prior to commencing construction and ongoing	MP 05_0147 Condition 5.2
All complaints received will be recorded in an up-to-date Complaints Register. The Complaints Register will be made available for inspection by the Secretary upon request.	NSW Ports	Ongoing	MP 05_0147 Condition 5.3
All complaints received will be recorded in an up-to-date Complaints Register. The Complaints Register will be made available for inspection by the Secretary upon request.			MP 05_0147 Condition 5.3
Dedicated pages within the Enfield ILC existing website will be maintained for the provision of electronic information associated with the project. Up-to-date information will be published and maintained on this website or dedicated pages.			MP 05_0147 Condition 5.4
The Secretary will be notified of any incident with actual or potential significant off-site impacts on people or the biophysical environment as soon as practicable after the occurrence of the incident. Written details of the incident will be provided to the Secretary within seven days of the date on which the incident occurred.			MP 05_0147 Condition 7.1
A register of accidents, incidents and potential incidents with actual or potential significant off-site impacts on people or the biophysical environment will be maintained. The register will be made available for inspection at any time by the independent qualified person or team conducting the Environmental Audit and/or the Secretary.			MP 05_0147 Condition 7.2
The cause or impact of any incident, as it relates to this approval, will be addressed as required by the Secretary.			MP 05_0147 Condition 7.3
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.			Sections 3.5 and 3.6
Construction employees and contractors will be suitably inducted and trained prior to commencing any work on site.		Prior to commencing construction and ongoing	Section 3.4

4.2 Air Quality

As required by Condition 6.3e, a *Construction Dust Management Protocol* (CDMP) has been prepared by SLR Consulting Australia (SLR) (2019a) for the Development and is attached as **Appendix D.** The CDMP aims to manage potential dust impacts by maintaining acceptable levels of amenity for surrounding residents, ensure compliance with relevant air quality criteria at surrounding receptor locations and minimise the impact of deposited dust from construction works on the surrounding environment and nearby residences.

The environmental controls detailed in the CDMP will be implemented to minimise the potential for adverse dust emissions and impacts during the construction phase. These are summarised in **Table 9.**

Table 9 Environmental Management Controls for Air Quality

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All trucks entering or leaving the site with loads will have their loads covered.	Management / Contractor / Employees	Ongoing	MP 05_0147 Condition 2.23
All activities will be undertaken with the objective of preventing visible emissions of dust beyond the boundary of the site. Should such visible dust emissions occur at any time, practicable dust mitigation measures will be implemented.			MP 05_0147 Condition 2.24
All haul roads will be managed, used and maintained to prevent dust emissions.			MP 05_0147 Condition 2.25
A 25 km/h speed limit will be imposed at Precinct E during construction to reduce dust emissions.	Management	During preparation and construction of the site.	MP 05_0147 Condition 2.26
Continuous ambient dust concentrations (PM_{10}) will be monitored at the two appropriate on-site locations. Results of dust monitoring will be recorded in μgm^{-3}.	Management / Contractor	From the commencement of soil disturbing works on the site until all large exposed areas have either been landscaped or sealed.	MP 05_0147 Condition 3.2
All dust and air quality complaints will be recorded. Identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Management	As required	CDMP Section 6
Ensure the complaints log is available to regulatory authorities when requested.			
Inspections and compliance checks will be undertaken to confirm compliance with all requirements of the CDMP.		Weekly	
Inspection frequencies will be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.		As required	

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
The site layout will be planned so that machinery and dust causing activities are located away from receptors.	Management / Contractor	Prior to commencing construction and ongoing	CDMP Section 6
Solid screens or barriers will be erected around dusty activities or the site boundary that they are at least as high as any stockpiles on site.		During dusty activities	
Specific operations will be fully enclosed where there is a high potential for dust production and the site is active for an extensive period.		Where feasible	
The generation of site runoff of water and/or mud will be avoided.		Ongoing	
Site fencing, barriers and scaffolding will be kept clean by using wet methods.			
Materials that have a potential to produce dust will be removed from site as soon as possible. If the materials are being re-used on site, then they will be covered.			
All stockpiles (if any) will be covered, seeded or fenced to prevent wind erosion.			
All on-road vehicles will comply with relevant vehicle emission standards.			
Stationary trucks will switch off engines if idling time on-site exceeds two minutes.			
Using the local road network will be avoided during peak traffic periods, where possible.			
The use of diesel or petrol powered generators will be avoided and mains electricity or battery powered equipment will be used, where practicable.			
Truck queuing and unnecessary trips will be minimised through logistical planning.			
Cutting, grinding or sawing equipment will be fitted with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.			
Adequate water supply will be provided for effective dust/particulate matter suppression/mitigation. Non-potable water will be used where possible and appropriate.			
Enclosed chutes and conveyors will be used.			
Equipment will be readily available on site to clean any dry spillages.			
No waste materials will be burned on site.			
Only the minimum area necessary will be excavated at any one time.			

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Excavation works and vehicle loading/unloading will be carried out when weather conditions are favourable (i.e. receptors are upwind from the works).	Management / Contractor	Ongoing	CDMP Section 6
Rehabilitation of disturbed areas will be undertaken as soon as practicable.			
If unanticipated strong odours or significant dust emissions are encountered on site, related work will be stopped and the Project Manager (or equivalent role) will be notified.			
Scabbling (roughening of concrete surfaces) will be avoided.			
Sand and other aggregates will be stored in bunded areas and will not allowed to dry out, unless this is required for a particular process, in which case appropriate additional control measures will be in place.			
Water-assisted dust sweepers 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.			
Additional water sprayers will be used during prolonged dust events.			
A cattle grid will be implemented (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). This will ensure Precinct E is consistent with Precinct C, F and H which all utilise cattle grids.			
Additional water sprayers will be used during prolonged dust events.			
Dust generating sources will be relocated or modified during prolonged dust events.			
Dust generating activities will be halted during prolonged dust events. Such activities will be resumed when conditions have improved.			

4.3 Noise

Construction noise at Precinct E will be managed in accordance with the *Construction Noise and Vibration Management Plan* (CNVMP) (SLR 2019b) prepared to fulfil Condition 6.3a of Project Approval MP 05_0147. The CNVMP is attached as **Appendix E**.

The CNVMP predicts worst-case noise levels at the most affected receivers to be up to 67 dBA during earthworks. In general, the construction works are predicted to result in relatively minor exceedances of the daytime noise management levels during the worst-case noise impacts. Noise management level exceedances of up to 8 dB are predicted at the most affected receiver to the north-west of the ILC site and up to 3 dB at receivers located to the east and south of the ILC site. The predicted levels do not exceed the Highly Noise Affected criterion of $L_{Aeq(15minute)}$ 75 dB.

The CNVMP is designed to address the potential noise and vibration impacts associated with the construction of the development. The environmental management controls in **Table 10** will be implemented to minimise the potential for adverse noise emissions from the construction of the Development.

Table 10 Environmental Management Controls for Noise

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Noise emissions from plant and equipment operated on the site shall be minimised by installing and maintaining, wherever practicable, efficient silencers, low noise mufflers (residential standard) and by replacing reversing alarms with alternative non-tonal or silent measures, such as quackers or flashing lights (subject to occupational health and safety requirements).	Management / Contractors	Prior to commencing construction and ongoing	MP 05_0147 Condition 2.13
Less intensive noise and vibration construction techniques will be used, where possible, to break rock and saw concrete.		Ongoing	CNVMP Section 7
Power tools will use mains power rather than generators.			
All works will be completed during standard daytime construction hours in accordance with **Section 2.2.**	Management / Contractors / Employees		
Truck routes to site will be limited to major roads.	Management / Contractors		
Respite offers will be considered where high noise and vibration generating activities are near receivers. As a guide, work will be carried out in continuous blocks that do not exceed three hours, with a minimum respite period of one hour between each block.			
Affected community members will be consulted with to determine the need for respite periods.	Management		
Site entry and exit points to be located as far as possible from sensitive receivers, where possible.			
Compounds and worksites will be designed to promote one-way traffic and minimise the need for vehicle reversing.			

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Work compounds, parking areas, equipment and material stockpiles will be located as far away from noise-sensitive locations as practicable.	Management / Contractors	Ongoing	CNVMP Section 7
Training will be provided to all personnel on noise and vibration requirements for the project. Inductions and toolbox talks will be used to inform personnel of the location and sensitivity of surrounding receivers.	Management	Prior to commencing construction	
Noisy plant or processes will be replaced by less noisy alternatives e.g. piling. Screwed piles generate less noise than impact-driven or percussive piling methods which will be avoided if possible.	Management / Contractors	Ongoing	
Using noisy plant simultaneously and close together will be avoided.	Management / Contractors / Employees		
Plant and equipment will be operated in the quietest and most efficient way, including not idling vehicles or equipment unnecessarily.			
The distance between noisy equipment and the nearest receivers will be maximised, wherever possible.	Management / Contractors		
Noisy equipment will: • Be sited behind structures that act as barriers; • Located at the greatest distance from the noise-sensitive area; and/or • Orientated away from any sensitive areas.			
Regular and effective maintenance of noise generating equipment will be undertaken, including checking 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.	Management / Contractors / Employees		
Dampened 'city' rock breakers/jackhammers will be utilised, where possible.	Management / Contractors		
Loading and unloading will be carried out away from noise sensitive areas.	Management / Contractors / Employees		
Trucks will not queue outside residential properties. Truck drivers will avoid compression braking as far as practicable.	Management / Contractors		
Trucks will be fully loaded during each trip to ensure truck movements are kept to a minimum.			
Purpose-built screening or enclosures will be installed around long-term fixed plant, where possible.		Prior to commencing construction	

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Equipment positioning will take advantage of existing screening from local topography i.e. position site huts, maintenance sheds and/or shipping containers between noisy equipment and the affected receivers.	Management / Contractors	Ongoing	CNVMP Section 7
Notifications should be provided to the affected community where high impacts are anticipated or where out of hours works are required.		Five days prior to undertaking works	
Where complaints are received, the work practices will be reviewed, and feasible/reasonable mitigation measures implemented to minimise any further impacts.		Following receipt of complaint	
Noise and/or vibration monitoring may be required in response to any complaints received to verify that levels are not substantially above the predicted levels.		Prior to commencing construction	
Where works are required within the safe working distances, vibration intensive activities must be kept to a minimum.			
Where works are required within the cosmetic damage safe working distances, dilapidation surveys will be completed before and after the works to ensure no cosmetic damage has occurred.		Prior to commencing and following completion of construction	
Vibratory compactors will not be used closer than 30 m from residential buildings unless vibration monitoring confirms compliance with the vibration criteria.		Ongoing	

4.4 Traffic

Construction traffic will be managed in accordance with the *Construction Traffic Management Protocol* (Ason Group 2019) (CTMP) (**Appendix F**) prepared to fulfil Condition 6.3b of Project Approval MP 05_0147.

The CTMP seeks to minimise traffic impacts on the surrounding road network, ensure the safety of workers, pedestrians and other road users, and provide information regarding the construction vehicle access routes.

The environmental management controls in **Table 11** will be implemented to ensure road safety and network efficiency during construction.

Table 11 Environmental Management Controls for Construction Traffic

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
The Road Transport Coordination Group will be maintained for the life of the project, to oversee and coordinate the management of traffic and road issues associated with and affected by the project.	NSW Ports	Ongoing	MP 05_0147 Condition 2.12
A 25 km/h speed limit will be imposed at Precinct E during construction.	Management	During preparation and construction of the site.	MP 05_0147 Condition 2.26
On-site parking and lay-down areas will be clearly delineated and communicated to staff and contractors.		Prior to commencing construction	CTMP Section 1.3.2
Details of parking arrangements, site access locations will be included in the Site Induction process.		During inductions	
All necessary works will be undertaken within the Precinct.		Ongoing	
Signage and appropriate speed limits within the site will be implemented where applicable.			
If roads need to be closed, relevant approvals will be obtained, and traffic controllers will be utilised where required.			
In the event that lane closures are required, then appropriate Traffic Control Plans will be prepared (and approved) prior to implementation.		As required	
All contractors and staff will be required to comply with on-site traffic requirements.	Management / Contractors / Employees	Ongoing	
No obstruction of public or internal roads by any materials / vehicles without obtaining the necessary approvals. All construction vehicles will be parked within the Precinct at all times.			
Vehicle movements/deliveries utilising heavy vehicles will be undertaken within approved construction hours and where possible, outside of peak traffic times (i.e. 8:00 am to 9:00 am and 5:00 pm to 6:00 pm).	Management / Contractors		

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All drivers shall adhere to the Driver Code of Conduct outlined in Section 5 of the CTMP.	Management / Contractors / Employees	Ongoing	CTMP Section 4.1.3
All deliveries and materials handling will occur on-site at all times.			CTMP Section 4.1.4
No on-street Work Zones are permitted on public roads / carriageways.	Management		CTMP Section 4.1.5
Wire mesh 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 4.1.6
All construction vehicles will access the site in a forward direction.	Management / Contractors / Employees	Ongoing	CTMP Section 4.2.2
Drivers will be responsible and accountable for their actions when operating a company vehicle or driving for the purposes of work.	Drivers		CTMP Section 5.3
The highest level of professional conduct will be displayed when driving a vehicle at work.			
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.	Drivers / Management		
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 regularly.	Drivers / Management		
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 4 of the CTMP.	Drivers / Management		
All drivers will obey the weight, length and height restrictions imposed by the National Vehicle Regulator, and other Government agencies.			
No tracked vehicles will be driven on a paved road.	Drivers		
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 / Management		
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 5.3
All near-hits, crashes and scrapes will be reported to management, including those that do not result in injury.	Drivers / Management		
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	Ongoing	
Pre-commencement checks will be undertaken for all new traffic related plant arriving on-site.	Management	Prior to first use	CTMP Section 5.4
Prestart inspections will be completed for all traffic related plant and equipment currently on-site.	Drivers / Management	Daily	
All construction plant will be fitted with a flashing light, fire extinguisher and non-tonal reversing alarm (or other safe and silent reversing systems that meet WH&S requirements).	Management	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: • Operator assessment as part of all inductions. • Regular 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.	Drivers / Management		
Improved fuel efficiency will be encouraged by: • Use of other transport modes or remote conferencing, whenever practical. • Providing training on, and circulating information about, travel planning and efficient driving habits.	Management		
If a vehicle crash occurs, the vehicle will be stopped as close as possible to the scene without hindering traffic.	Drivers / Management	Following a vehicle crash	CTMP Section 5.5
If a vehicle crash occurs, the list of information listed in Section 5.5 of the CTMP should be recorded.		When leaving the site	
Vehicles leaving the site will drive over a cattle grid, located at the site's access, to vibrate off any loose material attached to construction vehicles. This will ensure Precinct E is consistent with Precinct C, F and H which utilise cattle grids.			CTMP Section 5.6

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
If required, high pressure water hoses will be used to remove any excess loose material attached to construction vehicles.	Drivers / Management	When leaving the site	CTMP Section 5.6
All loads will be safely covered and/or restrained whilst driving on the public road network.			
The CTMP will be reviewed in accordance with Section 7.1 of the CTMP.	Management	Monthly	CTMP Section 7.1

4.5 Heritage

A *Heritage Interpretation Plan and Strategy* (HIPS) was prepared by Conybeare Morrison (2009) for the overall Enfield ILC site to provide heritage services for the management of heritage items and other structures of interest on the former Marshalling Yards at Enfield. An addendum to the HIPS was completed in 2010 by Sydney Ports.

The HIPS details seven heritage items to be managed at the site, including:

- Yard Master's Office;
- Wagon Repair Shed;
- Tarpaulin Factory;
- Pedestrian Footbridge;
- Administration Building;
- Pillar Water Tank; and
- DELEC Service Centre.

To date, most of these items have been demolished or removed offsite. An additional *Heritage Impact Statement* (HIS) prepared by Conybeare Morrison (2016) indicated the only items that remain within the overall Enfield ILC site are the Tarpaulin Factory and the Pillar Water Tanks). The Pillar Water Tanks was relocated from a central area at Enfield ILC to the southern precinct, on the southern side of the Tarpaulin Factory. Therefore, no heritage items are located within the vicinity of Precinct E and will not be impacted by the project.

4.6 Waste

Construction waste will be managed in accordance with the *Waste and Recycling Management Plan* (SLR 2018) which was prepared as part of MOD 14 to MP 05_0147 and is attached as **Appendix G**.

All attempts will be made to minimise construction waste generation and implement reuse/recycling opportunities. The primary construction waste streams to be generated, along with their respective waste classifications under the *Waste Classification Guidelines Part 1: Classifying Waste* (EPA 2014) include:

- Site clearance and excavation wastes, including excavated fill, soil and/or rock;
- Demolition wastes, including hazardous waste;
- Construction waste;
- Plant maintenance waste;
- Packaging waste;
- Work compound (on site employees) waste; and
- Wastewater (from dewatering of excavations, plant maintenance and construction activities).

As shown in **Table 12** below, the estimated construction waste to be generated by Precinct E is approximately 790 tonnes (SLR 2018).

Table 12 Construction Wastes

Material	Quantity (tonnes)
Timber	40
Concrete	290
Bricks	50
Gyprock	40
Sand / Soil	185
Metal	80
Other	105
Total	**790**

Table 13 lists the environmental controls that will be implemented to minimise the potential for adverse impacts as a result of waste generated during the construction phase of the Development.

Table 13 Environmental Management Controls for Waste

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All waste materials removed from the site will only be directed to a waste management facility lawfully permitted to accept the materials.	Management / Contractors	Ongoing	MP 05_0147 Condition 2.39
All liquid and/ or non-liquid waste generated, stored on the site or disposed of, will be assessed and classified in accordance with the *Waste Classification Guidelines* (EPA, 2014).			MP 05_0147 Condition 2.40
The transport of any hazardous and/or industrial and/or Group A waste from the site will be conducted strictly in accordance with any requirements that may be specified by the EPA in relation to the transport of those wastes.			MP 05_0147 Condition 2.41
Materials will be delivered on an "as needs" basis to mitigate material degradation by weathering or moisture damage.	Management		WRMP Section 5.7
Site preparation and construction wastes will be sorted and segregated to ensure efficient recycling of wastes.	Management / Contractors		
Wastes will be stored appropriately to prevent cross-contamination and/or mixing of different waste types.			
Packaging wastes will be reduced 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.	Management		
Volumes of materials will be estimated to reduce over purchasing.			
Formwork will be reused where appropriate.			
Subcontractors will be informed of and required to implement site waste management procedures.		Prior to commencing construction	
Separate waste bins will be provided for recyclable and non-recyclable general wastes.		Ongoing	WRMP Section 5.8
Waste oil will be recycled/disposed of in an appropriate manner.	Management / Contractors		
Roofing material cut-offs will be retained for re-use.			
Crates will be retained for storage purposes unless damaged.			
Cardboard, glass and metal wastes will be recycled.	Management / Contractors / Employees		

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Packaging waste will be reduced by return of packaging to suppliers where possible, use of returnable bulk packaging, through bulk purchasing and requesting cardboard or metal drums, and metal straps, in place of plastics that can't be recycled.	Management / Contractors	Ongoing	WRMP Section 5.8
Solid waste timber, brick, concrete, tiles, asphalt and rock (where such waste cannot be re-used on site) will be recycled/disposed of to an appropriately licenced construction and demolition (C&D) waste recycling facility or an appropriately licenced landfill.			
Sorting and segregation of wastes will be undertaken to ensure efficient reuse and recycling of materials throughout construction activities.	Management / Contractors / Employees		WRMP Section 5.9.1
Waste bins will not be filled beyond recommended filling levels.			WRMP Section 5.9.3
All bins and loads of waste materials leaving site will be covered.	Management / Contractors		
Waste records will be maintained.			
Wastewater or liquid waste generated from site preparation or construction activities will not enter the stormwater system or migrate offsite.	Management / Contractors / Employees		WRMP Section 5.11
Spillages will be contained immediately (if safe to do so) and the Project Manager notified as soon as possible.			WRMP Section 5.12
Spill containment kits and spill control equipment will be provided and maintained in sufficient numbers and at appropriate locations to allow ready and rapid access by site personnel. Safety Data Sheets (SDSs) will also be available to provide advice on spill clean-up and disposal.	Management		
Standard signage will be posted in all waste storage / collection areas to inform and educate users of waste storage / collection areas while promoting waste minimisation and resource recovery.			WRMP Section 5.14
Signage will be located to ensure visibility and well-lit at all times. All waste containers / areas will be labelled correctly and clearly to identify stored materials. Bin lid stickers will be affixed to each bin, advising of the bin waste type.			
Signs approved by the NSW EPA for labelling of waste materials are available online and will be used where applicable.			

4.7 Landscaping and Ecology

In accordance with Condition 6.3d of MP 05_0147, a *Landscape and Ecological Area Management Plan* (LEAMP) (2016) was prepared for the overall Enfield ILC site by NSW Ports with input from AECOM (see **Appendix H**). The LEAMP outlines the management measures to be implemented during the construction of Precinct E to prevent impacts to the landscape and ecology at the Enfield ILC.

Precinct E does not support any ecological communities or existing native vegetation or species on site. Although Precinct E is separate from the Green and Golden Bell frog habitat area in the Southern Ecological Area, there is a possibility that the Green and Golden Bell frog may be located on site within the basin that exists adjacent to works. The basin will remain unaffected and managed accordingly.

Table 14 details the relevant control measures in relation to landscaping and ecology during the construction of Precinct E.

Table 14 Environmental Management Controls for Landscaping and Ecology

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Rubbish and debris will be removed from planting areas.	Management / Contractors	Ongoing	LEAMP Section 4.1
Inspection records of all landscape and ecological management area actions will be kept and provided to NSW Ports.			LEAMP Section 4.1.2
Overflow drains will be cleared of mulch and other foreign material.		Monthly	LEAMP Section 4.1.7
Truck movements along the north-south haul road to Mt Enfield will not occur outside daylight hours, unless otherwise undertaken under special authorisations issued under the project approval.	Management / Contractors / Employees	Ongoing	LEAMP Section 4.2.1
Sediment and erosion control measures, including silt fences, will be erected downstream of active emplacement or earthworks areas which have not yet been stabilised to catch any silt from surface construction runoff and prevent sedimentation of downstream receiving waters.	Management / Contractors	Prior to commencing construction	
The contractor will thoroughly water the plants (i.e. soaked to a depth of 200 mm).		Before planting, immediately after planting, then fortnightly for the first 6 weeks, then as required to maintain growth rates free of stress.	LEAMP Section 4.2.2

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All staff will be notified in the site induction about the possibility of Green and Golden Bell frogs being found on site.	Management	During induction and prior to commencing works on site	NSW Ports
Should a Green and Golden Bell frog be discovered in the course of works, works will cease and NSW Ports will be contacted to relocate the frog.		Ongoing	

4.8 Soil and Water

A *Contaminated Soil Disturbance Management Plan* (CSDMP) was prepared by Coffey (2019) for Precinct E at the Enfield ILC. The CSDMP has been prepared based on Site Audit Statements (SASs) and Site Audit Reports (SARs) previously prepared by Ramboll Australia and site inspection by Coffey.

The purpose of the report is to manage disturbance of asbestos contaminated soil which has previously been capped on site. The CSDMP is designed for the bulk earthworks phase of works – additional controls may be required if excavation is carried out through the new cap into asbestos impacted soil at a later stage.

Condition 6.3f of MP 05_0147 details the requirement to include *Mt Enfield Stabilisation Management Plan* (Leighton Contractors 2012) as part of the CEMP. Mt Enfield is located at the southern end of the Site and will therefore not be impacted by the construction works at Precinct E.

Table 15 details the mitigation measures to be implemented on site to manage the impacts of contaminated soils. Additional management measures will be implemented for water, erosion and sediment controls as shown below.

Table 15 Environmental Management Controls for Soil and Water

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Soil and water management controls will be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during site preparation and construction activities, in accordance with Landcom's *Managing Urban Stormwater: Soils and Construction*.	Management / Contractors	Prior to commencing construction and ongoing	MP 05_0147 Condition 2.29
All stockpiled construction materials will be adequately located, stabilised and maintained to prevent erosion or dispersal of the materials.		Ongoing	MP 05_0147 Condition 2.30
The stormwater detention basins will be maintained, generally consistent with the basin sizes/ locations presented in the document referred to under conditions 1.1m) and 1.1n) of MP 05_0147.	NSW Ports		MP 05_0147 Condition 2.31
Rainwater tanks will be installed and maintained for the collection of water for domestic uses on the site. Collected rainwater will be used preferentially to external potable water supplies.	Management / Contractors	Prior to commencing construction and ongoing	MP 05_0147 Condition 2.33
Contaminated areas that are disturbed by construction works will be remediated prior to the commencement of project operations at these areas.		Prior to commencing operation	MP 05_0147 Condition 2.42
Any asbestos or asbestos-contaminated materials that may be uncovered during the construction will be managed strictly in accordance with the requirements under *Protection of the Environment Operations (Waste) Regulation 2014* and any guidelines or requirements issued by the EPA in relation to those materials.	Management / Contractors / Employees	Ongoing	MP 05_0147 Condition 2.44

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Contaminated Soils			
Asbestos contaminated soil will be covered with a geo-textile barrier to provide a warning of the presence of underlying soil contamination. The geo-textile marker layer will meet the following conditions: • Water permeable; • High visibility; • Rot-proof and chemically inert; • High tensile strength; • Coverage of contaminated area and 0.5 m beyond boundary if practical; and • Parallel sheets to be fixed together or overlap by 20 cm.	Management / Contractors	Prior to commencing works on site	CSDMP Section 8.3
The geotextile marker layer will be covered with imported soil, finished with slabs for the buildings, pavements for driveways, pedestrians and carparking, and landscaping material.		As required	CSDMP Section 8.4
In paved areas, the capping will be a minimum of 0.5 m thick, which will include the following slab/pavement thicknesses: • Warehouses and other hardstand areas: 160 mm - 200 mm thick concrete slab; • Carparks and roads: 180 mm thick concrete slab / bitumen overlay; and • Pedestrian Pavements: 110 mm thick concrete.		During construction	
Pavement surfaces will be underlain by a suitable subbase material to provide minimum thickness.			
A marker layer will be placed in areas to separate asbestos impacted fill and the clean materials used to form the capping layer.			
Geofabric will be laid on impacted fill (if present) prior to laying basecourse materials for these structures as a marker layer should future re-development take place.		Prior to laying basecourse materials	
Fill material required to be imported to the site (i.e. soil, sand, aggregate (including base/subbase materials) and mulch) for backfilling, grading and landscaping purposes will be suitable from a contamination perspective for use.		Prior to importing fill	
Excavated natural material (ENM) and virgin excavated natural material (VENM) will have appropriate certification in accordance with the EPA ENM/VENM exemption and order.		Prior to importing or exporting ENM and or VENM	
Commercial products including but not limited to aggregates, topsoil, sand and mulch will have laboratory testing documentation from the source and have a specification.		Prior to use of materials described	

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
An Environmental Consultant will approve the use VENM/ ENM or aggregates, topsoil etc. *Note: National Association of Testing Authorities (NATA) endorsed analytical results may be required and/or further assessment of the material may be requested at the discretion of the Environmental Consultant prior to importation.*	Management / Contractors	Prior to importation	CSDMP Section 8.4
An assessment of the soil, sand and aggregate used for backfilling and capping will also be carried out to confirm the material is suitable for use.		During importation	
No recycled construction and demolition aggregate will be used as fill as there is the potential to import asbestos mixed within the product.		During construction	
The following information will be recorded and maintained by the contractor and provided to Goodman/ NSW Ports at the completion of the works: • Type, quantity and description of material imported; • Date and time of import; • Source of material; and • Truck registrations.		During importation	
All imported soils will be undertaken in accordance with the CSDMP.		Ongoing	
Topographic surveys will be carried out following placement of the geo-textile marker layer and at the completion of pavements/landscaping so that the depth of capping can be recorded for inclusion in the Validation Report and the long-term environmental management plan (LTEMP). The survey will be carried out: • With reduced levels (RL) to Australian Height Datum (AHD) and latitude/longitude coordinates; and • On a grid of at least 5 m x 5 m, and 5 m interval spacing along boundaries		As required	CSDMP Section 8.5
Waste generated during the earthworks will be required to be disposed off-site.	Management / Contractors / Employees	Ongoing	CSDMP Section 8.6
Asbestos will be transported by an appropriately licensed transporter and disposed to a facility that is licensed to receive that class of waste.	Licenced Transporter and Earthworks Contractor		
In the unlikely event that soils are required to be disposed offsite, the materials will be required to be classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines.* This must be approved by the Site Auditor. Evidence will be included in the Validation Report.	Earthworks Contractor		
Imported fill and materials taken offsite must be tracked for validation purposes.	Management / Contractors		CSDMP Section 8.7

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All documentation listed in Section 8.8 of the CSDMP must be recorded and provided to Goodman / NSW Ports.	Management / Contractors	Ongoing	CSDMP Section 8.8
A Validation Plan will be prepared to ensure that relevant information is gathered and presented such that an assessment can be made as to the suitability of the site for its intended purpose. The Validation Plan will include all the requirements listed in Section 9 of the CSDMP.		Prior to commencing earthworks	CSDMP Section 9
All relevant licences and approvals will be obtained from the relevant authorities.			CSDMP Section 11
Observations by a suitably qualified consultant will be carried out during placement of the geo-textile fabric to assess the requirements specified in Section 8.4 of the CSDMP are met.		During placement of the geo-textile fabric	CSDMP Section 9.2
To confirm the material is suitable for use, the following will be carried out: • Review of product documentation (i.e. VENM/ENM certificates, topsoil/mulch certification/documentation, base specifications); and • A visual inspection, sampling, field screening, laboratory analysis and assessment of the results.		Prior to / during importation	CSDMP Section 9.3
Imported fill materials will be visually observed by an Environmental Consultant to check that it is consistent with that described in the source documentation, and for the presence of potential contamination.		During importation	CSDMP Section 9.3.1
Fieldwork will be undertaken by experienced and appropriately qualified environmental consultant following written field procedures which are based on industry accepted standard practice and the amended ASC NEPM 2013.		As required	CSDMP Section 9.3.2
Soil samples will be collected.		During importation	
Samples will be collected from temporary stockpiles using a hand auger, shovel, or excavator depending on the dimensions of the stockpile and access.			
A photo-ionisation detector (PID) will be used to screen soil samples for the potential presence of volatile organic compounds (VOCs).			
New nitrile gloves will be used between each sampling location to reduce the potential for cross contamination.			
Collect validation samples in accordance with Section 9.3.3 of the CSDMP.		During sampling	CSDMP Section 9.3.3
Store and analyse samples including VOCs in accordance with Section 9.3.4 of the CSDMP.		As required	CSDMP Section 9.3.4

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
The following processes will be undertaken in accordance with Sections 9.3.5, 9.3.6, 9.3.7, 9.3.8 of the CSDMP respectively: • Decontamination procedures; • Equipment calibration; • Field quality control sample collection; and • Laboratory analysis.	Management / Contractors	As required	CSDMP Sections 9.3.5, 9.3.6, 9.3.7, 9.3.8.
Laboratory results for material imported as VENM will meet the definition of VENM as per the POEO requirements and also meet the validation criteria.		Ongoing	CSDMP Section 9.3.9 SPFIP Section 3.2.3
Asbestos results will be required to be reported as 'no asbestos detected'.		As required	CSDMP Section 9.3.9 SPFIP Section 3.2.5
If the imported recycled aggregates are found to contain asbestos, they will either be removed from site, or a risk assessment will be carried out to further assess the material's suitability. Note the assessment will be in accordance with methodology and criteria detailed in Section 9.3.9 of the CSDMP.			CSDMP Section 9.3.9
Topsoil material imported for use at the site will be compared against the relevant HSLs, Health Investigation Levels (HILs), Ecological Screening Levels (ESLs) and Ecological Investigation Levels (EILs) for commercial/industrial land use as supplied in ASC NEPM.		Prior to importation of soil	
If sampling of mulch for asbestos is required, use the adopted criteria for mulch imported to site in presence/absence of asbestos.		As required	
If asbestos is identified in mulch used at site, it will be removed from site.			
Consideration will be given to the presence of soils that are odorous or discoloured as a result of contamination, contain visible asbestos containing material (ACM), excessive extraneous material, for qualitative aesthetic purposes		Ongoing	CSDMP Section 9.3.9 SPFIP Section 3.2.6
Project specific quality assurance/quality control (QA/QC) procedures will be implemented to improve transparency, consistency, comparability, completeness, and confidence in the data collected.			CSDMP Section 9.4

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
A validation report will be prepared in general accordance with OEH 2011 and the amended ASC NEPM 2013, documenting that the capping works have been completed. This report will be prepared to include all information detailed in the CSDMP Section 9.5 and Section 3.3 of the SPFIP.	Management / Contractors	At the completion of the earthworks and capping	CSDMP Section 9.5 SPFIP Section 3.3
A LTEMP will be prepared by a suitably qualified Environmental Consultant in general accordance with the relevant guidelines and include all information detailed in Section 10 of the CSDMP.	NSW Ports	Following completion of the capping works	CSDMP Section 10
A SafeWork NSW Class A Licensed Asbestos Removal Contractor (LARC) will be required to conduct and/or oversee asbestos related works. The Class A LARC supervisor will be required to be present at the site during asbestos related works.	LARC	Ongoing	CSDMP Section 11.1
As friable asbestos has previously been identified on-site, a NSW Licenced Asbestos Assessor (LAA) will be required on-site during earthworks for supervision, air monitoring and perform visual clearances.	LAA		
The Class A LARC will be required to lodge and obtain the necessary SafeWork NSW asbestos removal permit prior to commencement of asbestos related works (5 days notification required).	Management / Contractors	5 days before commencing works	CSDMP Section 11.2
An Asbestos Removal Control Plan (ARCP) will be required to be prepared by the LARC and submitted with the notification. The ARCP will align with the information contained in Section 11.2 of the CSDMP.			
Consultation with adjoining properties will be carried out to alleviate concerns associated with asbestos, which may arise during earthworks.		Prior to commencement of asbestos related works	CSDMP Section 11.3
The following contact details will be displayed in a prominent location (such as the entrance or site office): • Site Manager (Qanstruct); • Project Manager (Qanstruct); • Goodman Site Representative; • LAA; and • Class A LARC.		Prior to works commencing	CSDMP Section 12
The appointed contractor and workers at the site will comply with all legislative, regulatory and guidance requirements, including but not limited to, the asbestos control measures outlined in Section 13 of the CSDMP.		Ongoing	CSDMP Section 13
Each individual involved in earthworks will be responsible for complying with all relevant Work Health and Safety legislation, regulations and guidelines.			CSDMP Section 13.1

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All records will be reviewed and updated as required and corrective actions will be implemented where necessary.	Management / Contractors	Ongoing	CSDMP Section 13.1
Access to asbestos work areas will be controlled.			
Soil tracking records will be maintained during relocation and stockpiling of contaminated soil.			
Record of the training undertaken by a worker carrying out licensed asbestos related work on site will be kept and readily accessible at the asbestos work area and available for inspection.			CSDMP Section 13.1
The LARC will give information about health risks of licensed asbestos removal work to a person likely to be engaged to carry out licensed asbestos work before the person is engaged to carry out the work.		Prior to commencement of asbestos related works	
All workers who carry out any of the asbestos-related work will be trained prior to commencing works in the identification and safe handling of, and suitable control measures for, asbestos. *Note: The Class A Supervisor / LAA may provide the asbestos awareness training on site.*			CSDMP Section 13.2
All contractors engaged in asbestos related works will be inducted to the CSDMP. Details of contractors or other personnel who have attended the induction are to be kept on the site in Appendix E of the CSDMP.			CSDMP Section 13.3 and **Section 3.4**
All relevant site personnel will participate in a toolbox talk. The toolbox talk must incorporate details and instructions on how to manage asbestos-impacted soil in accordance with the CSDMP. The toolbox will be signed off by all participants and records retained. The toolbox talk can be combined with the Induction if practicable.			CSDMP Section 13.4 and **Section 3.4**
Signage and barricades will be placed around the asbestos work areas. Signs should be in accordance with *AS 1319-1994.*		Prior to the commencement of construction works and for the duration of works	CSDMP Section 13.5
Ensure the general public cannot see in to the work site due of the perceived risk of exposure, which could be exacerbated when observing workers wearing asbestos related Personal Protective Equipment (PPE) / Respiratory Protective Equipment (RPE).		Ongoing	CSDMP Section 13.5
Dust suppression techniques will be required to control generation of visible dust during the course of the works.			CSDMP Section 13.6
Erosion and sediment controls will be in place prior to commencement of work.		Prior to commencing earthworks	CSDMP Section 13.7

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
To minimise tracking of contaminated soil on vehicles leaving the site, a wheel wash bay will be installed at the site entrance/exit. This shall comprise a wheel wash and cattlegrid underlaid by geo-textile fabric with aggregate on either side. • All vehicles are to be washed in the wheel wash bay prior to leaving the site; • Where vehicles have been used on surfaces deemed to be contaminated, tyres and wheels and are to be cleaned using a low-pressure hose and/or hand tools where necessary; and • If vehicles used on contaminated surfaces are cleaned in the wheel wash bay, the underlying geotextile fabric, accumulated soil and aggregate must either be placed beneath the cap or be disposed of as special waste, asbestos waste to an appropriately licenced facility following waste classification sampling.	Management / Contractors	Prior to commencing earthworks and ongoing	CSDMP Section 13.8
Personnel onsite will be required to wear appropriate personal protective equipment (PPE) in line with WHS requirements specific to the task. For workers working within the site during excavation and handling of asbestos impacted soil, the following PPE/Respiratory Protective Equipment (RPE) is also mandatory: • Half face respirator (i.e. Sundstrom SR900 Half Mask) with P3 particle filter; • Footwear that can be easily decontaminated (i.e. gumboots) or disposable booties; • Type 5 Tyvek suits; and • Disposable nitrile gloves. *Note: Excavator operators or truck drivers may be exempt from asbestos RPE requirements if it can be shown that the excavator/truck cabs can be sealed during works and reverse cycle air conditioning can be engaged.*		Prior to commencement of asbestos related works	CSDMP Section 13.9
Respirators must comply with *AS/NZS1715–2009 Selection, use and maintenance of respiratory equipment.*		Ongoing	
Occupational protective gloves must comply with *EN 420:1994(AS/NZS 2161.2:1998) – Occupational Protective Gloves, Part 2 General Requirements*. *Note: Examples of appropriate PPE and RPE are provided in the CSDMP Appendix F.*			
Decontamination facilities will be required for machinery, equipment, and workers carrying out asbestos related work. All decontamination will be undertaken in accordance with Section 13.10 of the CSDMP.		Following asbestos related works	CSDMP Section 13.10

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Asbestos impacted soil will be handled in manner in which to minimise the potential for cross contamination of areas that have been previously been cleared by: • Placing the soil directly into a dump truck or skip bins; • Not overloading the dump truck or skip bins; • Keeping movements of vehicles, plant and equipment to a practical minimum and maintaining low speeds during transportation; • Using designated transportation routes/corridors between precincts and designated stockpile areas; • Tracking of soil from cradle to grave by principal contractor; and • Stockpiling spoil on a reasonably robust barrier (i.e. concrete, geofabric and plywood).	Management / Contractors	Ongoing	CSDMP Section 13.11
Stockpiles will be established: • Away from adjacent properties, drainage lines and water bodies. Avoid designated drains, sumps and low-lying areas subject to flooding or runoff; and • On a reasonably robust barrier (i.e. concrete, geofabric and plywood).			CSDMP Section 13.12
Stockpiles will: • Not exceed the height of site boundary hoarding to minimise dust generation from the site; • Be less than 2m in height with side slopes to be a maximum ratio of 1V:2H; • Be appropriately labelled to minimise the risk of cross contamination; and • Be positioned and formed to minimise potential for stockpile erosion where possible.			
Stockpiles will be wetted down, covered with 200 µm polythene sheeting or geofabric.		At the end of each day	
A LAA will carry out air monitoring of the work area during excavation and handling of asbestos impacted soil. This will be completed in accordance with Section 13.13 of the CSDMP.		Ongoing	CSDMP Section 13.13
Air monitoring will be conducted by a National Association of Testing Authorities (NATA) accredited laboratory in accordance the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC: 3003 (2005)] and Australian Standard AS ISO/IEC 17025 – 2005 *General requirements for the competence of testing and calibration laboratories.*		As required	

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Works will be suspended if the air monitoring results are found to be above the detection limit of 0.01 fibres per millilitre of air (f/mL). Refer to the CSDMP Section 13.13 Table 7 for control limits/action levels.	Management / Contractors	As required	CSDMP Section 13.13
The LAA will be required to carry out visual clearance inspections of the site to verify that areas of the site can be reoccupied without asbestos controls including, but not limited to: • Where asbestos impacted soil has been removed to underlying natural soil; • Where asbestos impacted soil has been capped with geofabric; and • At the completion of the works. The LAA who carried out the clearance inspection must issue a clearance certificate before the area requiring clearance is re-occupied.			CSDMP Section 13.14
A clearance certificate will not be issued unless LAA is satisfied that: • The inspection area, and the area immediately surrounding it, are free from visible asbestos; and • Air monitoring results, if undertaken as part of the clearance inspection, shows asbestos below 0.01 fmL.			
In the event of an issue or unexpected find, the corrective actions in Table 8 of the CSDMP will be followed.			CSDMP Section 14
Water, Erosion and Sediment Control			
Silt fencing, drain protection, hay bales, diversion drains and other runoff controls will be installed as appropriate to prevent uncontrolled offsite discharge of surface water and/or runoff.	Management	Ongoing	WRMP Section 5.13
Stockpiles will be placed within a securely fenced area.	Management / Contractors		
Stockpiles will be located on hardstand where possible. If hardstand areas are not available for stockpiling, stockpiles will be placed on heavy duty plastic sheeting.			
Stockpiles of fill material will be separated from stockpiles of natural soil/bedrock.			
Should contaminated material be uncovered it will be stockpiled separately from uncontaminated material.			
Stockpiles will be compacted and battered.			
The height of individual stockpiles will not exceed 2 m.			

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Sediment controls will be placed around each area containing stockpiles of a certain type (e.g. stockpiles of contaminated material, stockpiles of uncontaminated material) such that: • No runoff from any other part of the site reaches the stockpiled material; • No uncontrolled runoff from stockpiles reaches any other part of the site; and • No uncontrolled runoff from any stockpile area reaches another stockpile area.	Management / Contractors	Ongoing	WRMP Section 5.13
Except when being worked on, stockpiles will be adequately and appropriately covered to minimise the potential for wind erosion, infiltration of rainwater and generation of runoff.	Management / Contractors / Employees		
Should unexpected finds be encountered during excavation or other earthworks, work will stop in all appropriate areas and the site supervisor notified.			WRMP Section 5.13.1
Water levels in the temporary sediment basins will be kept to a minimum to be ready to intercept rainfall or for water in the event of an emergency.	Management / Contractors		*Emergency Management Plan* Section 4.1
Sediment controls will be implemented.	Management / Contractors	Prior to the commencement of construction works	CSDMP Section 13.7

4.9 Spoil Re-Use and Fill Importation Protocol

A *Spoil Re-use and Fill Importation Protocol* (SPFIP) has been prepared by SLR (2019c) in accordance with Condition 6.3 of MP 05_0147.

It is expected that approximately 31,254 m^3 of fill will be required for the earthworks at Precinct E of which 23,126 m^3 of clean material will be imported. Should there be any surplus material at the completion of footings and underground services this will be exported to Precinct A for use there. No material will be exported from Enfield ILC.

The SPFIP (SLR 2019c) outlines the requirements for the acceptance of fill materials at Precinct E, including the requirements for material assessment, testing and record keeping. All unexpected finds will be undertaken in accordance with Section 2 of the SPFIP (SLR 2019c) and Table 8 of the CSDMP (Coffey 2019).

A copy of the SPFIP is attached as **Appendix J.**

4.10 Hazards, Risks and Emergencies

Hazard and emergencies will be managed in accordance with the *Emergency Management Plan* prepared by Qanstruct. A copy of the *Emergency Management Plan* is attached as **Appendix K**.

The following mitigation measures are to be implemented on site throughout the duration of construction at Precinct E.

Table 16 Environmental Management Controls for Hazards, Risks and Emergencies

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
The transport of any hazardous and/or industrial and/or Group A waste from the site will be conducted strictly in accordance with any requirements that may be specified by the EPA in relation to the transport of those wastes.	Management / Contractor	Ongoing	MP 05_0147 Condition 2.41
All dangerous goods will be stored and handled strictly in accordance with: a) all relevant Australian Standards; b) *Work Health and Safety Regulation 2017.*	Management / Contractor / Employees		MP 05_0147 Condition 2.50
Names and contact numbers of nominated Emergency Wardens will be consolidated in writing.	Contractors	Commencement of works on site and whenever the details change	Emergency Management Plan
Specialised equipment and training (such as First Aiders, First Aid Kits and Fire Extinguishers) will be provided for dealing with emergencies that may arise from contractor's work.		Ongoing	
Sub-contractors will be advised of the time and date of the emergency drill in advance so that continuity of critical works can be scheduled around the drill time and arrangements made for skeleton crews to remain on site, if necessary.	Management	Prior to the emergency drill	
The Site/ Location Manager has overall responsibility for any emergency that occurs on their project/office and will fill the role of Emergency Wardens.	Site/ Location Manager	During an emergency	
The Emergency Wardens will maintain their training to enable them to coordinate the emergency response for their project/office, including accounting for all persons on site and conducting regular drills.	Emergency Warden	Ongoing	
The Emergency Warden will notify and be point of contact in the event of any emergencies or incidents that may affect existing facilities and or personnel.		During an emergency	
Support will be provided to the Site/ Location Manager to manage any emergency; including preparation of communications that the Director will have with the client/media/other external bodies.	The Construction Manager, OHS Manager and Director/s		

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All persons on site (contractors, visitors, site-based personnel and non-site-based personnel) will follow any directions of the Emergency Warden.	All personnel	During an emergency	Emergency Management Plan
The Construction Manager and OHS Manager will prepare a site Emergency Response procedure which will include: • Project Risk Assessment identifying site specific Emergency Response requirements; • Site Emergency Information Sheet; and • First Aid Assessment.	Construction Manager and OHS Manager	Prior to establishment of a Qanstruct site	
The Site Manager will: • Display the Site Emergency Information on the site sheds and noticeboard/s; • Display a Site Plan identifying First Aid Locations and the Evacuation Assembly point/s (two) in the site sheds; • Review the First Aid Assessment, make contact with surrounding businesses if their activities/ our works may impact the Emergency Response procedure and consult the Construction Manager if any changes are required; • Establish a Site Induction which details the site Emergency Response procedure; and • Display Wardens and First Aiders information on notice boards.	Management	Upon establishment of a Qanstruct site	
Where Qanstruct staff are involved in maintenance and other minor works on an existing facility, Qanstruct staff and subcontractors will complete the existing facility's Site Induction.		Ongoing	
Adequate personnel will be trained to respond to emergency situations in the workplace.			
Emergency drills will be conducted and recorded on the Evacuation Drill Register. Following the drill, a Toolbox Meeting will be held to discuss the findings of the drill and amend the site Emergency Procedures if required.		At least every 3 months	
Each company on the project will provide adequate First Aid trained persons and facilities for their works. Where works may cause a fire, the work crew will also provide Fire Extinguishers and persons trained to use them. A register of Fire Fighting Equipment will be maintained by all companies providing this equipment.		Ongoing	
Qanstruct will provide at least one First Aid Officer and First Aid Kit on every site. The First Aid Officer will be trained to Level 2 First Aid and be immunised for Hepatitis B.			
The First Aid Assessment (Form 26) will determine the number of First Aid Officers and number and type of First Aid Kits.			

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
To test effectiveness of the Emergency Evacuation Procedure, Qanstruct will conduct evacuation drills, involving contractors on site.	Management	Ongoing	Emergency Management Plan
Checking and maintenance of the First Aid Kits will be conducted onsite.	First Aid Officers (OHS Rep)		
Evacuation drills will be conducted onsite.	Site Manager		
The Emergency Evacuation Drills will be scenario based determined by the Project Risk Assessment and held every 3 months.	Management	Every 3 months	
The drills will be recorded on the Project Evacuation Drill Register and once the Evacuation Drill is completed the Site Emergency Drill will be completed for debrief purposes.		Following completion of Evacuation Drills	
Projects will be assessed on an individual basis to determine if more drills are required during the project life. The assessment will consider the following: • The type and scale of the project; • The site location and surrounding environment; • The number of trades on site at any given time; • The turnover of trades and personnel on site; and • The risk level of works being carried out on site at any given time.		Ongoing	
On sites where Emergency Evacuation Signals utilise hand held air horns, additional air horns will be brought in for each drill.		Prior to Evacuation Drills	
Under no circumstances will the site air horns be used for any drills.		Ongoing	
The emergency evacuation signals (whether installed or hand-held horns) will be tested to ensure correct operation.	Site Manager in conjunction with the OHSE Manager	Weekly	
Evacuation drills for all office-based staff at Qanstruct's head office will be conducted and recorded on Form 36 (Project Evacuation Drill and Site Emergency Drill).	The OHSE Manager	Annually	
All stakeholders will be contacted and advised on the incident. Serious incident is defined in the *Emergency Management Plan* (Appendix K).	Management	In the event of a serious or notifiable incident	
The Site Manager will inform the Construction Manager and/or Head of Safety and Environment of the incident. If no contact can be made, an SMS will be sent.		Within 30 minutes of an incident	
If no contact can be made with either the Construction Manager or the OHS Manager, the respondent will contact the Site Manager.	Emergency or incident respondent	Within 1 hour of the incident occurring	

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Goodman / NSW Ports will be contacted to decide on further persons to communicate with, including: • Local regulator; • Next of kin of persons involved in the incident; • Office of the Federal Safety Commission; and • Client	Site Manager, Construction Manager and OHS Manager	Directly following an incident	Emergency Management Plan
Goodman / NSW Ports will be Qanstruct's contact for media enquiries.	The Director	Ongoing	
No person will proactively approach the media regarding a serious / notifiable incident prior to the teleconference and determination of the strategy going forward (this includes using social media to inform others of an incident).	Management and contractors		
The person nearest to the fire must immediately notify the Site Manager.		Following a fire	
All workers carrying out works that may generate sparks or may ignite a fire will ensure that there are no combustible materials within 3 m of the work area and that a suitable fire extinguisher is on hand		Prior to commencing work	
A spotter will be designated prior to any works being carried out which may generate sparks or ignite a fire.			
All fires will be investigated for their cause and a report prepared indicating the cause, whether the response was satisfactory and whether any improvements can be made to reduce the likelihood of recurrence and improve response procedures.	Management	Following a fire	
Entry will not be permitted to the site until all clear has been issued by the emergency services.	Emergency Services	Following an emergency	
Casualties will not be moved unless there is immediate danger of further injury.	Management	During incident / emergency	
Workers involved in the clean-up will be provided with all equipment and Personal Protective Equipment (PPE) specified by the product Safety Data Sheet (SDS).		Following incident/ emergency	
Clean-up methodology will be in accordance with the SDS register.		Following a spill	
All waste will be disposed of in strict accordance with the SDS Register and the Environmental Protection Agency (EPA) Requirements.			
Uncontained spills of 50 Litres or more will be notified to the EPA.			

5 Monitoring, Reporting and Auditing

5.1 Monitoring and Inspection

Table 17 summarises the monitoring requirements for the Development as set out in Project Approval MP 05_0147 and relevant management plans.

Table 17 Monitoring and Inspection Requirements

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
General			
The Compliance Tracking Program to track compliance with the requirements of MP 05_0147 will be maintained.	NSW Ports	Ongoing	MP 05_0147 Condition 4.1
Noise and Vibration			
Noise and/or vibration monitoring may be required in response to any complaints received to verify that levels are not substantially above the predicted levels.	Management	Following receipt of complaint	CNVMP Section 7
Where works are required within the safe working distances, vibration monitoring will be undertaken to confirm that vibration is within acceptable levels.		Prior to commencing construction	
Where works are required within the cosmetic damage safe working distances, dilapidation surveys will be completed before and after the works to ensure no cosmetic damage has occurred.		Prior to commencing and following completion of construction	
Air Quality			
Continuous ambient dust concentrations (PM_{10}) will be monitored at two appropriate on-site locations. Results of dust monitoring will be recorded in μgm^{-3}.	Management	From the commencement of soil disturbing works on the site until all large exposed areas have either been landscaped or sealed.	MP 05_0147 Section 3.2
Air quality monitoring will be undertaken in accordance with Section 8 of the CDMP, and is summarised below: 1. Suspended particulate monitoring - PM_{10}. 2. Meteorological Station - Wind speed and direction.	Management	1. Continuous 2. Continuous	CDMP Section 8
A LAA will carry out air monitoring of the work area during excavation and handling of asbestos impacted soil. This will be completed in accordance with Section 13.13 of the CSDMP.	LAA appointed by management	During excavation and handling of asbestos impacted soil	CSDMP Section 13.13

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Air monitoring will be conducted by a NATA accredited laboratory in accordance the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition* [NOHSC: 3003 (2005)] and Australian Standard AS ISO/IEC 17025 – 2005 *General requirements for the competence of testing and calibration laboratories*.	Management	As required	CSDMP Section 13.13
The LAA will be required to carry out visual clearance inspections of the site to verify that areas of the site can be reoccupied without asbestos controls including, but not limited to: • Where asbestos impacted soil has been removed to underlying natural soil; • Where asbestos impacted soil has been capped with geofabric; and • At the completion of the works. The LAA who carried out the clearance inspection must issue a clearance certificate before the area requiring clearance is re-occupied.	Management / Contractors		CSDMP Section 13.14
Waste			
Construction waste stream volumes and their respective management (reused, recycled or disposed) will be monitored and recorded. The evidence for waste recycling/disposal services will be retained and made available for inspection by Council/EPA. This includes weighbridge dockets, invoices, receipts and a log book recording waste classifications and containing the site validation certificate.	Management/ Contractors	Ongoing	WRMP Section 5.16
Daily inspections will be undertaken prior to leaving the site to ensure all waste items are appropriately contained and covered so as not to become a source of windblown litter and to ensure storm water controls are in place in case of rain to prevent waste contamination of storm water drains.		Daily	
Soil			
To confirm the material is suitable for use, the following will be carried out: • Review of product documentation (i.e. VENM/ENM certificates, topsoil/mulch certification/documentation, base specifications); and • A visual inspection, sampling, field screening, laboratory analysis and assessment of the results.	Management/ Contractors	Prior to / during importation	CSDMP Section 9.3
Imported fill materials will be visually observed by an Environmental Consultant to check that it is consistent with that described in the source documentation, and for the presence of potential contamination.		During importation	CSDMP Section 9.3.1

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Landscaping			
Overflow drains will be cleared of mulch and other foreign material.	Management / Contractors	Monthly	LEAMP Section 4.1.7
Emergency			
Regular inspections will be undertaken of the emergency equipment such as fire extinguishers, first aid provisions and facilities, and chemical storage/bunding. All records of maintenance and inspections are to be kept. Equipment found to be defective will be repaired.	Management	Every 6 months	Emergency Management Plan Section 4.1
Water levels in the temporary sediment basins will be kept to a minimum to be ready to intercept rainfall or for water in the event of an emergency.		Ongoing	
Live emergency drills will be undertaken. The effectiveness of the drills will then be recorded and reviewed. The Emergency Management Plan will be updated following review.	Management / Contractor / Employees	Within 3 months of commencing construction then every 6 months thereafter	Emergency Management Plan Section 4.3
The Emergency Management Plan will be reviewed monthly in accordance with Appendix G of the Emergency Management Plan.	Management	Monthly	Appendix G of Emergency Management Plan

5.2 Reporting

Table 18 summarises the reporting requirements for the Development as set out in Project Approval MP 05_0147 and relevant management plans.

Table 18 Reporting Requirements

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
General Environmental Performance			
The Compliance Tracking Report for the Enfield ILC is provided by NSW Ports to the Secretary in accordance with Condition 4.1 of MP 05_0147.	NSW Ports	Annually in October	MP 05_0147 Condition 4.1
All complaints received will be recorded in an up-to-date Complaints Register and made available for inspection by the Secretary upon request.	Management / NSW Ports	Ongoing	MP 05_0147 Condition 5.3
Dedicated pages within the Enfield ILC existing website, will be maintained for the provision of electronic information associated with the project. Up-to-date information will be published and maintained on this website or dedicated pages.	NSW Ports		MP 05_0147 Condition 5.4
Incident Reporting			
The Secretary will be notified of any incident with actual or potential significant off-site impacts on people or the environment as soon as practicable after the occurrence of the incident. Written details of the incident will be provided to the Secretary within seven days of the date on which the incident occurred.	Management / NSW Ports	Ongoing	MP 05_0147 Condition 7.1
A register of accidents, incidents and potential incidents with actual or potential significant off-site impacts on people or the environment will be maintained. The register will be made available for inspection at any time by the independent qualified person or team conducting the Environmental Audit and/or the Secretary.			MP 05_0147 Condition 7.2
The cause or impact of any incident, as it relates to this approval, will be addressed as required by the Secretary.			MP 05_0147 Condition 7.3
Landscaping			
Inspection records of all landscape and ecological management area actions will be kept and provided to NSW Ports.	Management / Contractor	Ongoing	LEAMP Section 4.1.2

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Soil			
In the unlikely event that soils are required to be disposed offsite, the materials will be required to be classified in accordance with the NSW EPA (2014) Waste Classification Guidelines. It will be the responsibility of Qanstruct to ensure that the waste soils are suitably classified, that they are transported by an appropriately licensed haulage firm, that the soil movements are tracked and documented, and that the soil is disposed of at a landfill that is appropriately licensed to accept the type of waste received. Evidence of such shall be provided to Goodman for inclusion within the Validation Report.	Management/ Contractors	As required	CSDMP Section 8.6
A Materials Tracking Plan will be prepared and record any materials transferred, imported or disposed offsite.			CSDMP Section 8.7
Asbestos and ACM over 100 kg or 10 m² will be tracked using the online "WasteLocate" system.			
A Validation Plan will be prepared to ensure that relevant information is gathered and presented such that an assessment can be made as to the suitability of the site for its intended purpose. The Validation Plan will include all the requirements listed in Section 9 of the CSDMP.			CSDMP Section 9
A validation report will be prepared in general accordance with OEH 2011 and the amended ASC NEPM 2013, documenting that the capping works have been completed. This report will be prepared to include all information detailed in the CSDMP Section 9.5 and Section 3.3 of the SPFIP.		At the completion of the earthworks and capping	CSDMP Section 9.5 SPFIP Section 3.3
The Class A LARC will be required to lodge and obtain the necessary SafeWork NSW asbestos removal permit prior to commencement of asbestos related works (5 days notification required).		5 days before commencing works	CSDMP Section 11.2
An Asbestos Removal Control Plan (ARCP) will be required to be prepared by the LARC and submitted with the notification. The ARCP will align with the information contained in Section 11.2 of the CSDMP.			
Soil tracking records will be maintained during relocation and stockpiling of contaminated soil.		Ongoing	CSDMP Section 13.1
Record of the training undertaken by a worker carrying out licensed asbestos related work on site will be kept and readily accessible at the asbestos work area and available for inspection.			

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Fill Importation			
A Fill Material Assessment Report will be required for each potential fill source site and will be provided to Qanstruct.	Fill Supplier	Prior to supplying fill	Appendix J
The Fill Material Assessment Report will be reviewed by Qanstruct prior to accepting fill on site.	Management	Prior to accepting fill	

5.3 Auditing

Table 19 summarises the reporting requirements for the Development as set out in Project Approval MP 05_0147 and relevant management plans.

NSW Ports last commissioned an annual Independent Environmental Audit in November. Annual audits will continue and these works will be subject to that audit.

Table 19 Auditing Requirements

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
An Independent Environmental Audit will be undertaken at least annually or as otherwise agreed by the Secretary, in accordance *with ISO 19011:2002 - Guidelines for Quality and/or Environmental Management Systems Auditing*.	NSW Ports	Annually	MP 05_0147 Condition 4.1c
Site audits will be undertaken. Audit findings/actions will be recorded in the Qanstruct Audit Register and provided to the project team for action.	Qanstruct's Project Manager	Quarterly	This document

6 CEMP Review

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

- Following any significant environmental incident or impact;
- Where there is any change to the scope of the Development's construction activities and/or disturbance footprint;
- Following any modification to Project Approval MP 05_0147;
- Where it is identified that the environmental performance of the Development is not meeting the objectives of the CEMP; and/or
- At the request of a relevant regulatory authority.

All employees and contractors will be informed of any revisions to the CEMP by Site Management during toolbox talks.

7 References

Ason Group (2019) *Construction Traffic Management Plan, Enfield Industrial Logistic Centre (Precinct E)*

Coffey Environments (2019) *Contaminated Soil Disturbance Management Plan*

Conybeare Morrison (2009) *Heritage Interpretation Plan and Strategy*

Conybeare Morrison (2016) *Heritage Impact Statement*

Department of Infrastructure, Planning and Natural Resources (2004) *Guideline for the Preparation of Environmental Management Plans*

EPA (2014) *Waste Classification Guidelines Part 1: Classifying Waste*

Goodman (2018) *Enfield ILC, Strathfield South MP 05_0147 MOD14 – Response to Submissions*

Leighton Contractors (2012) *Mt Enfield Stabilisation Management Plan*

LJB Urban Planning (2017) *MP 05_0147 Modification Application No. 13*

LJB Urban Planning (2017) *MP 05_0147 Modification Application No. 13 – Response to Submissions*

NSW Ports (2013) *Intermodal Logistics Centre: Enfield - Modification Application No.8*

NSW Ports (2016) *Landscape and Ecological Area Management Plan*

Qanstruct (2016) *Emergency Management Plan*

SLR Consulting (2018) *Waste and Recycling Management Plan*

SLR Consulting (2019a) *Construction Dust Management Protocol*

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

SLR Consulting (2019c) *Spoil Re-use and Fill Importation Plan*

Sydney Ports (2010) *Heritage Interpretation Plan and Strategy – Addendum*

Sydney Ports (2009) *Project Approval Modification Application - Intermodal Logistics Centre at Enfield, Sydney Ports Corporation*

Sydney Ports (2009) *Intermodal Logistics Centre at Enfield - Modification Application*

Sydney Ports (2011) *Intermodal Logistics Centre at Enfield - Modification Application No.5*

Sydney Ports (2012) *Intermodal Logistics Centre at Enfield - Modification Application No.6*

Sydney Ports (2012) *Intermodal Logistics Centre at Enfield - Modification Application No.6 - Response to Submissions*

TFA Projects Group (2016) *Environmental Assessment Modification Application No. 11 (Additional Warehouse) - Intermodal Logistics Centre at Enfield;*

TFA Projects Group (2016) *Environmental Assessment Modification Application No. 11 (Additional Warehouse) - Intermodal Logistics Centre at Enfield - Response to Submissions*

TFA Projects Group (2016) *Environmental Assessment Modification Application No. 12 (Extension of Existing Rail Sidings and Administration Office Expansion) - Intermodal Logistics Centre at Enfield*

TFA Projects Group (2016) *Environmental Assessment Modification Application No. 12 (Extension of Existing Rail Sidings and Administration Office Expansion) - Intermodal Logistics Centre at Enfield - Response to Submissions*

Urbis (2018) *Modification Report MP 05_0147 Enfield Intermodal Logistics Centre (Mod 14)*

Urbis (2018) *Modification Report MP 05_0147 Enfield Intermodal Logistics Centre (Mod 14) – Response to Submissions*

APPENDIX A

Project Approval MP 05_0147

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Planning, approve the project referred to in Schedule 1, subject to the conditions in Schedule 2.

These conditions are required to:

- prevent, minimise, and/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 project.

This consolidated instrument includes the following approved modifications:

a) under section 75W on 7 October 2008 (MOD 1);
b) under section 75W on 30 March 2009 (MOD 2);
c) under section 75W on 27 May 2010 (MOD 4);
d) under section 75W on 10 November 2011 (MOD 5);
e) under section 75W on 21 December 2012 (MOD 6);
f) under section 75W on 27 November 2013 (MOD 8);
g) under section 75W on 8 February 2017 (MOD 11);
h) under section 75W on 7 March 2017 (MOD12);
i) under section 75W on 19 June 2018 (MOD 13); and
j) under section 75W on 24 August 2018 (MOD 14).

Frank Sartor MP
Minister for Planning

Sydney, 5 September 2007 File No: 9037344

SCHEDULE 1

Application No:	05_0147
Proponent:	NSW Ports
Approval Authority:	Minister for Planning
Land:	Lot 2, DP 1006861, Lot 3 DP 1006861, Lot 101 DP 1001498, Lot 14 DP1007302, Lot 15 DP 1007302, Lot 1 DP 950438, Railway land as denoted on sheets 2 and 4 of DP 242426, Cosgrove Road, South Strathfield.
Project:	Construction and operation of the Enfield Intermodal Logistics Centre with capacity to accept a maximum

throughput of 300,000 TEU (one TEU is equivalent to one twenty foot container) per annum, including:

- demolition, relocation or removal of former railway buildings and structures;
- earthworks and drainage including the levelling of the site, formation of landscape mounds and detention basins and removal of unsuitable materials, as required;
- construction and operation of:
  - an intermodal terminal for the loading and unloading of containers;
  - rail sidings, railway lines and associated works to connect to the existing freight line;
  - warehousing for the packing and unpacking of containers and the short-term storage of cargo;
  - empty container storage facilities, for the storage of empty containers to be later packed or transferred back to the port or regionally by rail;
  - light industrial/commercial area fronting Cosgrove Road;
  - access works including the construction of a road bridge over the new marshalling yards for access to Wentworth Street and an upgrade of the entrance to the site from Cosgrove Road; and
  - internal roads, administration buildings, diesel and LPG storage and fuelling facilities, container washdown area, vehicle maintenance shed, and installation of site services (all utilities, stormwater and sewerage).

Major Project:

The proposal is declared a Major Project under section 75B(1)(a) of the *Environmental Planning and Assessment Act 1979*, because it is a development of a kind described in clause 23 of Schedule 1 to *State Environmental Planning Policy (Major Projects) 2005*.

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SCHEDULE 2

Act, the	*Environmental Planning and Assessment Act, 1979*
Applicable authority	For the purposes of conditions 2.6A and 2.6B, the relevant owner and provider of services that are likely to be affected by the development
Conditions of Approval	The Minister's conditions of approval for the project.
Department, the	Department of Planning and Environment.
EA	*Environmental Assessment: Intermodal Logistics Centre at Enfield* (prepared by Sinclair Knight Merz on behalf of Sydney Ports Corporation and dated October 2005).
EPA	Environment Protection Authority
EPL	Environment Protection Licence issued under the *Protection of the Environment Operations Act, 1997*
Minister, the	Minister for Planning.
OEH	Office of Environment and Heritage
Planning Secretary, the	Secretary of the Department of Planning and Environment (or delegate).
Planning Secretary's Approval	A written approval from the Planning Secretary (or delegate). Where the Planning Secretary's Approval is required under a condition the Planning Secretary will endeavour to provide a response within one month of receiving an approval request. The Planning Secretary may ask for additional information if the approval request is considered incomplete. When further information is requested the time taken for the Proponent to respond in writing will be added to the one month period.
Proponent	Sydney Ports Corporation
Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre).
RMS	Roads and Maritime Services
Site	Land to which Major Projects Application 05_0147 applies.
Site Audit Report	As defined in section 4 of the *Contaminated Land Management Act 1997*
Site Audit Statement	As defined in section 4 of the *Contaminated Land Management Act 1997*
TEU	Twenty foot equivalent unit – one TEU equals one twenty foot container.

1. ADMINISTRATIVE CONDITIONS

Terms of Approval

1.1 The Proponent shall carry out the project generally in accordance with the:

a) Major Projects Application 05_0147;

b) *Environmental Assessment: Intermodal Logistics Centre at Enfield,* dated October 2005 and prepared by Sinclair Knight Merz (SKM);

c) response to submissions and revised Statement of Commitments detailed in *Intermodal Logistics Centre: Preferred Project Report* prepared by Sinclair Knight Merz Pty Ltd, dated June 2006;

d) additional information provided by Sinclair Knight Merz Pty Ltd to the Department titled *Project Changes – Enfield ILC* and dated 14 July 2007;

e) additional information provided by Sinclair Knight Merz Pty Ltd to the Department titled *Light Industrial and Commercial Area – Enfield ILC* and dated 6 August 2007;

f) letter from Sydney Ports Corporation titled Project Approval Modification Application Intermodal Logistics Centre at Enfield, Sydney Ports Corporation (undated) and received 28 August 2008;

g) letter from Sydney Ports Corporation titled *Project Approval Modification Application Intermodal Logistics Centre at Enfield, Sydney Ports Corporation* and dated 5 February 2009;

h) *Intermodal Logistics Centre at Enfield Modification Application* ILC-E-PT3A REV A , Sydney Ports Corporation and dated 31 August 2009;

i) *Intermodal Logistics Centre at Enfield, Modification Application 05_0147 – Project Adjustments. Response to Stakeholders Submissions* (Revision A), prepared by Sydney Ports Corporation and dated November 2009;

j) *Intermodal Logistics Centre at Enfield, Modification Application 05_0147 – Project Adjustments. Supporting Information to Modification Application,* prepared by Sydney Ports Corporation and dated 26 March 2010;

k) *Intermodal Logistics Centre at Enfield, Modification Application 05_0147 – On Site Management of Unsuitable Engineering Fill,* prepared by Sydney Ports Corporation and dated May 2011*;*

l) *Intermodal Logistics Centre at Enfield Modification Application No. 5 On Site Management of Unsuitable Engineering Fill Response to Submissions,* prepared by Sydney Ports Corporation and dated August 2011; and

m) *Intermodal Logistics Centre at Enfield, Modification Application No.6 Early Contractor Involvement Detailed Design Adjustments and Subdivision*, prepared by Sydney Ports and dated April 2012;

n) *Intermodal Logistics Centre at Enfield, Modification Application No.6 ECI Detailed Design Adjustments and Subdivision,* prepared by Sydney Ports and dated July 2012;

o) *Intermodal Logistics Centre: Enfield Modification Application No 8, Subdivision – Changes and Amendments,* prepared by NSW Ports and dated 2 September 2013;

p) *Addendum Assessment Report, Modification No.8 to Major Project MP 05_0147 – Intermodal Logistics Centre (ILC) at Enfield: Subdivision Changes and Amendments*, prepared by NSW Ports and dated 19 September 2013;

q) *Environmental Assessment – Modification Application No. 11 – Additional warehouse* prepared by TfA Project group dated September 2016 and supporting information dated 6 December 2016 and 23 December 2016;

r) Environmental Assessment – Modification Application No. 12 – Extension of Existing Rail Sidings and Administration Office Expansion prepared by TfA Project Group dated November 2016 and supporting Noise Impact Assessment prepared by SLR Consulting dated 3 November 2016;

s) Environmental Assessment – Modification Application No. 13 – 127 Cosgrove Road. South Strathfield, prepared by LJB Urban Planning dated August 2017; and the associated Remediation Action Plan (RAP), 127 Cosgrove Road, South Strathfield, NSW, Flower Power Group, prepared by ZOIC, February 2017; Green and Golden Bell Frog Conservation Measures Tarpaulin Shed Site Enfield, prepared by Biosphere Environmental Consultants, 27 November 2016; and email titled RE: Enfield Intermodal Logistics Centre MOD 13, prepared by LJB Urban Planning Pty Limited, dated 28 May 2018;

t) Environmental Assessment – Modification No. 14 – Modification of Built Form and operational parameters prepared by Urbis dated January 2018, and Enfield ILC, Strathfield South MP 05_0147 MOD14 – Response to Submissions submitted by Goodman on 8 June 2018; and

u) the conditions of this approval

1.2 In the event of an inconsistency between:

a) the conditions of this approval and any document listed from condition 1.1a) to 1.1t) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and

b) any of the documents listed from condition 1.1a) to 1.1t) inclusive, the most recent document shall prevail to the extent of the inconsistency.

1.2A Notwithstanding condition 1.2, in relation to the construction and operation of the development approved under DA 2016/132 at 127 Cosgrove Road, in the event of any inconsistency between the conditions of this approval and the conditions of consent for DA 2016/132, the conditions of consent for DA 2016/132 shall prevail.

1.2B Subject to condition 1.2C, despite any other provision of this approval, the approval does not impose any obligations on a person merely because that person is carrying out the development approved under DA 2016/132 at 127 Cosgrove Road.

1.2C A person who is remediating land and (in the course of so doing) is transferring material from the land identified as Part Lot 19 DP1183316 and outlined in red on drawing SENP154B is subject to obligations under this approval in relation to that work – and if condition 1.2B would otherwise apply – that person's obligations under this person's obligations under this project approval cease when a site audit statement is submitted under condition 2.43A.

1.3 The Proponent 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 approval; and

b) the implementation of any actions or measures contained in these reports, plans or correspondence.

1.3A The Proponent may construct and/or operate the project in stages with commensurate staging of compliance with the conditions of this approval. Where the project is to be staged, the Proponent shall submit details of the staging to the Planning Secretary, including details of how compliance with the conditions of this approval will be met.

1.3B With the approval of the Planning Secretary, the Proponent may:

a) prepare and submit any strategy, plan or program required by this approval 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 approval (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 approval (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).

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 approval.

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.

Limits of Approval

1.4 This approval shall lapse five years after the date on which it is granted, unless the works the subject of this approval are physically and substantially commenced on or before that time.

Capacity Limits and Staging

1.5 The project shall be limited to a maximum throughput of 300,000 TEU per annum, for the rail to intermodal terminal interface and warehousing interface.

Note: For the avoidance of doubt, this does not include internal TEU movements.

Warehousing and Distribution

1.6 The Proponent is permitted to construct and operate warehouses across six precincts on the site (A, C, D, E, F and H) associated with the project, generally in accordance with the documents referred to under condition 1.1 t). Warehouses are permitted to be used for freight handling, packing/re-packing, storage and distribution, and for activities ancillary to these uses. Each warehouse shall not exceed a height of 13.7 metres at its highest point (excluding minor ancillary structures such as communications equipment, air conditioning units, or solar panelling), and shall be limited to a footprint no greater than the relevant area specified in Table 1 below.

Table 1 - Maximum Gross Lettable Area (per precinct)

Warehouse	Maximum Gross Lettable Area ($m^{2)}$
A	62,600
C	10,487
D	11,460
E	7,604
F	9,620
H	16,475

1.7 No warehouse is permitted to undertake packaging, repackaging or decanting of dangerous goods unless and until the Proponent has submitted a risk assessment of such operations for the approval of the Planning Secretary. Any such risk assessment shall be undertaken in accordance with *Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis* (DUAP, 1997) and *Multi-Level Risk Assessment* (DUAP, 1997).

1.8 Prior to the commencement of construction of each warehouse, the Proponent shall submit final designs for the warehouse to the Planning Secretary, demonstrating that the warehouse is generally consistent with:

a) the warehouse designs and layouts presented in the documents referred to under condition 1.1t) of this approval;
b) the design specifications detailed under condition 1.6 of this approval;
c) the findings and recommendations of any approved risk assessment undertaken in accordance with condition 1.7 of this approval; and
d) the general principles presented in the Strathfield *Consolidated Development Control Plan 2005* (in particular, that component of the Plan formerly being *Development Control Plan No. 27 – Industrial Development*).

Note: nothing in this condition relieves the Proponent from any other obligation in the *Environmental Planning and Assessment Act 1979* with regard to building design and certification, including compliance with the Building Code of Australia.

Light Industrial/ Commercial Area

1.9 The Proponent is permitted to construct and operate a light industrial/ commercial area comprising one precinct associated with the project, generally in accordance with the documents referred to under condition 1.1t). The light industrial/ commercial area shall only be permitted to operate for the purpose of development associated with, or ancillary to the intermodal terminal, empty container storage areas and related warehousing, or otherwise consistent with the general principles of the Strathfield Consolidated Development Control Plan 2005 (in particular, that component of the Plan formerly being Development Control Plan No. 27 – Industrial Development). Each building within the light industrial/commercial area shall not exceed a height of 13.7 metres at its highest point (excluding minor ancillary structures such as communications equipment, air conditioning units, or solar panelling), with the gross floor area for the precinct limited to no greater than the relevant area specified in Table 2 below.

Table 2 - Maximum Precinct Gross Floor Areas

Light Industrial/ Commercial Precinct	Maximum Gross Lettable Area (m^2)
B	7,384

1.10 No component of the light industrial/ commercial area is permitted to store, handle or transfer dangerous goods above the thresholds specified in *Applying SEPP 33* (DUAP, 1994) (ie characterisation of such development as "potentially hazardous development" as defined under *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*), unless and until the Proponent has submitted a Hazard Analysis for the approval Planning Secretary. The Hazard Analysis shall be prepared in accordance with *Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis* (DUAP, 1997) and *Multi-Level Risk Assessment* (DUAP, 1997). Operation of each relevant component of the light industrial/ commercial area shall not operate until the Planning Secretary's approval of the applicable Hazard Analysis has been issued (if required under this condition).

1.11 Prior to the commencement of construction within each precinct of the light industrial/ commercial area, the Proponent shall submit final designs and layouts for the precinct to the Planning Secretary, demonstrating that the precinct is generally consistent with:

a) the designs and layouts presented in the document referred to under conditions 1.1t) of this approval;
b) the design specifications detailed under condition 1.9 of this approval; and

c) the general principles presented in the Strathfield *Consolidated Development Control Plan 2005* (in particular, that component of the Plan formerly being *Development Control Plan No. 27 – Industrial Development*).

Note: nothing in this condition relieves the Proponent from any other obligation in the *Environmental Planning and Assessment Act 1979* with regard to building design and certification, including compliance with the Building Code of Australia.

Toll Lease Area

1.11A The Proponent shall ensure that operations in the former Toll lease area (also known as Precinct D) are generally consistent with former operations.

Statutory Requirements

1.12 The Proponent shall ensure that all licences, permits and approvals are obtained and kept up-to-date as required throughout the life of the development. No condition of this consent removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals. The Proponent shall ensure that a copy of this approval and all relevant environmental approvals are available on the site at all times during the project.

Water Authority Compliance Certificate

1.13 An application shall be made to Sydney Water for a Certificate under Part 6, Division 9, section 73 of the *Sydney Water Act 1994* (Compliance Certificate). The application must be made through an authorised Water Servicing Coordinator.

1.14 The section 73 Compliance Certificate must be obtained from Sydney Water Corporation and submitted to the Principal Certifying Authority prior to issue of a subdivision certificate, and show that the development has met the detailed requirements of Sydney Water Corporation.

Subdivision and Easements

1.15 The Proponent may subdivide the land generally in accordance with the subdivision plan EILC MP04 (B) included at Appendix 1 of this approval. However, prior to obtaining a subdivision certificate, the Proponent shall prepare and submit to the Planning Secretary a final subdivision plan for the land. The final subdivision plan shall be generally consistent with the plan included at Appendix 1 of this approval (including the number of lots, the proposed use of each lot, and lot sizes).

1.16 Land uses and operations within each lot shall be consistent with the approved project as described in conditions 1.1a) to 1.1t) and meet the requirements of this approval.

1.17 Prior to the issuing of the subdivision certificate, the Proponent shall ensure that each lot is connected to services, drainage and utilities.

1.18 Easements for services, drainage, maintenance or any other encumbrances and indemnities required for joint or reciprocal use of part or all of the proposed lots as a consequence of the subdivision of the site, shall be created over those lots pursuant to the *Conveyancing Act 1919.*

1.19 Documentary evidence of the proposed easements shall be provided to, and be to the satisfaction of the relevant certifying authority.

Note: Any easements in the subdivision plan must nominate Strathfield Council or other relevant authority as the authority to release, vary or modify the easement. The form of the easement must be in

accordance with Council's standard recitals for terms of easements, or the standard form of easements accepted by NSW Land and Property Information.

1.20 Prior to occupation and/or operation, the Proponent shall provide to the relevant certifying authority evidence that all matters required to be registered on title, including easements required by this approval and any approvals or consents, have been lodged for registration or registered at the NSW Land and Property Information.

2. SPECIFIC ENVIRONMENTAL CONDITIONS

Traffic and Transport Impacts

2.1 The Proponent shall provide a shuttle bus service between Strathfield train station and the site during peak construction works, and shall encourage construction employees to utilise public transport rather than private transport to the site.

2.2 The Proponent shall provide a manual and/ or technological solution to control the frequency of articulated and B-double vehicles utilising the Cosgrove Road entrance to the site during morning and afternoon peak periods.

Intermodal operations

2.2A The proponent is to provide an **Intermodal Freight Transportation Report**, prepared by an independent qualified person(s) approved by the Planning Secretary.

The purpose of the Intermodal Freight Transportation Report is to detail how the Proponent is working to increase the modal share of rail, and is to include the following:

a) the number of twenty-foot equivalent shipping containers despatched and received during the period;
b) modal splits of container volumes (in TEUs), provided by the warehouse operators and/or the intermodal operators, moved in/out of the project by:
   i. rail-to-truck/truck-to-rail, and
   ii. truck-to-truck;
c) representative vehicle origins and destinations, based on data from the warehouse operators and/or the intermodal operators;
d) review of recorded actual traffic generation against the traffic model referred in, and the findings of, the report titled *Traffic Impact Assessment Enfield Intermodal Logistics Centre; Cosgrove Road, Enfield MOD 14 Ref: 0440r03v5* (Ason Group, 26 February 2018);
e) a constraints and opportunities analysis to assist with identifying measures to increasing the modal split of container movements via rail-to-truck/truck-to-rail; and
f) a future forecast outlining expected TEU volume despatched and received on rail, demonstrating how the Proponent is using the opportunities identified above, subject to the constraints identified, to assist with switching the main mode of transport for container TEUs to rail.

The report is to be submitted throughout operation of the project, with the first report to be submitted one year after the commencement of operation of the first warehouse/s permitted as part of the approval of MP 05_0147 MOD 14, unless otherwise agreed by the Planning Secretary. Subsequent reports will be completed and submitted to the Planning Secretary on a two-yearly basis, or as otherwise agreed.

Note: Subject to condition 1.3B, the requirements of this condition are in addition to the requirements of the Traffic and Capacity Monitoring Program and the Traffic Audit required under conditions 3.6-3.9, and the Proponent may elect to address the requirements of any of those conditions in a consolidated document.

2.2B A framework for recording and reporting on the data required for the report required under condition 2.2A is to be prepared by an independent qualified person(s) approved by the Planning Secretary, and submitted to the Planning Secretary for approval three months prior to the commencement of operation of any warehouse permitted as part of the approval of MP 05_0147 MOD 14.

The Proponent shall prepare the report required under condition 2.2A in accordance with the framework for recording and reporting approved by the Planning Secretary under this condition from time to time.

2.2C The Proponent is to comply with any reasonable additional operation traffic management measures as directed by the Planning Secretary in consultation with Transport for NSW and RMS following review of any Intermodal Freight Transportation report, Traffic and Capacity Monitoring Program, or Traffic Audit.

On-Site Traffic Management and Parking

2.3 The Proponent shall design, construct and maintain all internal road works, including the associated 816 parking facilities and loading bays for operational areas associated with the ILC, warehouses and light industrial/commercial uses, to meet or exceed the following requirements:

a) compliance with the provisions of relevant Australian Standards, RMS standards and guidelines;
b) installation of clear signage to demarcate all vehicle movements within the site;
c) provision of directional pavement arrows on all internal roads, and line-marking and signage to indicate designated truck routes and bays;
d) internal roadways wide enough to accommodate through traffic and turning two-way traffic;
e) design of site ingress and egress points to ensure that vehicles enter and leave the site in a forward direction;
f) installation and maintenance of any landscaping on the site so as not to affect driver sight distance for vehicles entering and exiting the site; and
g) clear demarcation of all visitor, disabled, ambulance and service vehicle parking areas.

2.3A The Proponent must prepare a Work Place Travel Plan to the satisfaction of the Planning Secretary prior to the issue of any Occupation Certificate for any warehouse permitted as part of the approval of MP 05_0147 MOD 14. The Proponent must ensure that the Work Place Travel Plan (as revised from time to time) is implemented for the life of the Project.

Local Area Traffic Management

2.4 Prior to the commencement of operation of the project, the Proponent shall develop and implement, in consultation with the RMS, Strathfield Municipal Council and Canterbury Bankstown Council, the following measures to prevent the movement of heavy vehicles through residential areas of Greenacre to the west of the project, generally between Roberts Road, Boronia Road and the Hume Highway:

a) physical measures to discourage through-traffic across Roberts Road at the intersection of Norfolk Road, with the aim of preventing heavy vehicles leaving

the project from directly accessing residential areas, and reducing the desirability of rat-running through those residential areas;

b) closure of the median strip on the Hume Highway at Como Road, to prevent heavy vehicles turning right into residential areas on the way to the project;

c) traffic calming measures on Rawson Road to reduce the desirability of heavy vehicles travelling along this route between the Hume Highway and the project;

d) stop signs on Noble Avenue at the intersections of Chiswick Road and Northcote Road to reduce the desirability of vehicles rat-running in a north-south direction through residential areas; and

e) imposition of load limits on Karuah Street and Valencia Street to prevent heavy vehicles lawfully using this route as a by-pass around Boronia Road.

2.5 Prior to the commencement of operation of the project, the Proponent shall consult with the State Transit Authority, and relevant bus operators, with the aim of relocating bus routes currently following Roberts Road. Should relocation of these bus routes be agreed between the parties, the Proponent shall install physical measures to prevent through-traffic across Roberts Road at the intersection of Norfolk Road. Any such road works shall be undertaken in consultation with, and to meet the requirements of, the RMS.

Notwithstanding condition 2.4b) of this approval, should physical measures be implemented on Roberts Road at the intersection of Norfolk Road, the Proponent shall review the need for closure of the median strip on Hume Highway at Como Road in consultation with RMS, and if agreed by the RMS, no longer be required to implement those works.

2.6 The Proponent shall investigate, in consultation with Strathfield Municipal Council, opportunities to install 4-hour parking restrictions along the full length of Wentworth Avenue to discourage the parking of trailers on the approach to the site. Should such measures be found to be feasible and agreed by Council, the Proponent shall arrange to have parking restrictions in place prior to the commencement of operation of the project.

2.6A Before the commencement of construction of any warehouse sharing a boundary with public infrastructure and permitted as part of the approval of MP 05_0147 MOD 14, the Applicant must:

(a) consult with the applicable authority 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 that shares a boundary with the site (including roads, gutters and footpaths); and

(c) submit a copy of the dilapidation report to the Planning Secretary and Council.

2.6B 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 the development; and

(b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

Note: This condition does not apply to any damage to roads caused as a result of general road usage.

Regional Traffic Management

2.7 Prior to the commencement of operation of the project, the Proponent shall upgrade the intersection of Roberts Road and Norfolk Road, as agreed with the RMS and in accordance with relevant RMS standards. The upgrade works shall comprise:

a) upgrade of the intersection to accommodate 19-metre semi-trailer and 25-metre B-double swept paths in accordance with relevant RMS guidelines and AUSTROADS standards;
b) extension of the Roberts Road northbound right-turn bay to 150 metres;
c) provision of a southbound slip lane into Norfolk Road;
d) provision of a diamond phasing operation on Norfolk Road to ensure right-turn movements can be carried out in a controlled and safe environment;
e) reconfiguration of Norfolk Road east to provide a right-turn bay, with the right-turn bays in Norfolk Road facing each other;
f) provision of three lanes for exiting traffic (including the right-turn bay) from Norfolk Road east by widening the intersection to the north; and
g) median island works on Roberts Road to achieve the necessary turning path on entry and exit to and from Norfolk Road.

2.8 Prior to the commencement of operation of the project, the Proponent shall validate that the intersection of Norfolk Road and Wentworth Street, and the intersection of Cosgrove Road and the Hume Highway can accommodate 19-metre semi-trailer and 25-metre B-double swept paths in accordance with relevant RMS guidelines and AUSTROADS standards. Where necessary, the Proponent shall arrange for the upgrade of these intersections to accommodate 19-metre semi-trailer and 25-metre B-double swept paths, in consultation with and to the satisfaction of the RMS. All upgrade works shall be completed prior to the commencement of operation of the project, unless otherwise agreed by the RMS.

2.9 Prior to the commencement of operation of the project, the Proponent shall validate that the pavement of Wentworth Street and Norfolk Road, between Roberts Road and the access point for the site is of a standard suitable for 19-metre semi-trailer and 25-metre B-double vehicles. Where necessary, the Proponent shall arrange for the upgrade of the pavement of these roads to a standard suitable for 19-metre semi-trailer and 25-metre B-double vehicles in consultation with and to the satisfaction of the RMS. All upgrade works shall be completed prior to the commencement of operation of the project, unless otherwise agreed by the RMS.

2.10 The Proponent shall investigate, and where feasible implement, measures at the intersection of Norfolk Road and Roberts Road to give priority (increased “green time”) to vehicles turning right from Norfolk Road into Roberts Road, in preference to vehicles turning left at that intersection. In considering options for such priority movements, the Proponent shall consult with the RMS, Strathfield Municipal Council and Canterbury Bankstown Council.

Rail and Road Infrastructure on RailCorp Land

2.11 Prior to the commencement of any works associated with the construction of connections to the existing freight rail network and the road bridge over the New Enfield Marshalling Yards, the Proponent shall consult with RailCorp to reach agreement on the detailed design and operational aspects of the rail and road infrastructure component of the project on RailCorp land. Design details shall include, but not be limited to:

a) the length of trains the rail facilities will be able to accept;
b) track layouts;
c) methods to be implemented to remove the remains of the former bridge abutment to allow for the rail connection;

d) position and clearance of proposed rail tracks;
e) position and clearance of the main railway line;
f) works required to Wentworth Street to link with the new road bridge;
g) position and clearance requirements of the marshalling yard tracks, internal access roads, turnouts and overhead structures in relation to the proposed road bridge; and
h) measures to treat any safety issues associated with the proposed new connections or road bridge.

All works associated with rail and road infrastructure on RailCorp land shall be undertaken in accordance with the agreement reached with RailCorp.

Coordination and Management of Transport Issues

2.12 The Proponent shall establish and maintain for the life of the project, unless otherwise agreed by the Planning Secretary, a **Road Transport Coordination Group** to oversee and coordinate the management of traffic and road issues associated with and affected by the project. The Group shall include representatives of the Proponent, the Department, the RMS, Strathfield Municipal Council and Canterbury Bankstown Council, and shall operate in accordance with terms of reference agreed by those parties at the first meeting(s) of the Group. The Proponent shall bear the full cost of administering the Group.

Noise Impacts

2.13 The Proponent shall minimise noise emissions from plant and equipment operated on the site by installing and maintaining, wherever practicable, efficient silencers, low-noise mufflers (residential standard) and by replacing reversing alarms with alternative silent measures, such as flashing lights (subject to occupational health and safety requirements).

Construction Noise

2.14 The Proponent shall, as soon as practicable during site preparation, and prior to the commencement of construction of rail trackwork and hardstand for the intermodal terminal, empty container and warehousing components of the project, install earth mound noise barriers in the south east of the site, as generally described in the documents referred to under condition 1.1 of this approval.

2.14A In the event that the Proponent is required to construct a temporary noise wall using empty containers to mitigate noise from operations occurring in the southern portion of the site and prior to the construction of Warehouse A, the Proponent shall ensure that the temporary noise wall is installed during the hours prescribed in condition 2.15.

2.15 The Proponent shall only undertake site preparation and construction activities associated with the project that would generate an audible noise at any residential premises during the following hours:
a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;
b) 8:00 am to 1:00 pm on Saturdays; and
c) at no time on Sundays or public holidays.

This condition does not apply in the event of a direction from police or other relevant authority for safety reasons.

2.16 The hours of site preparation and construction activities specified under condition 2.15 of this approval may be varied with the prior written approval of the Planning

Secretary. Any request to alter the hours of construction specified under condition 2.15 shall be:

a) considered on a case-by-case basis;
b) accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and
c) accompanied by sufficient information for the Planning Secretary to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site.

Operation Noise

2.17 The Proponent shall design, construct, operate and maintain the project to ensure that the operational noise contributions from the project do not exceed the maximum allowable noise contributions specified in Table 3 below, at those locations and during those periods indicated. The maximum allowable noise contributions apply under:

a) wind speeds up to 3 ms^{-1} (measured at 10 metres above ground level); or
b) temperature inversion conditions up to 3°C per 100 metres and wind speeds up to 2 ms^{-1} (measured at 10 metres above ground level).

Table 3 – Maximum Allowable Noise Contribution (dBA)

Location	Day 7:00am to 6:00pm on any day		Evening 6:00pm to 10:00pm on any day		Night 10:00pm to 7:00am on any day		
	L_{Aeq} (15-minute)	L_{Aeq} (period)	L_{Aeq} (15-minute)	L_{Aeq} (period)	L_{Aeq} (15-minute)	L_{Aeq} (period)	L_{A1} (1-minute)
A1 – Eastern end of Jean Street	54	54	54	49	48	42	58
A2 – Eastern end of Ivy Street	53	52	52	51	47	45	57
A3 – Wentworth Street (south)	49	52	47	53	42	38	52
A4 – Eastern end of Gregory Street	49	52	47	46	45	37	55
A5 – Western end of Blanche Street	46	58	46	50	43	43	53
A6 – 40 Bazentin Street	46	58	45	54	41	39	51
A11 – Begnell Park	-	50	-	50	-	50	-
A12 – Matthew Park*	-	50	-	50	-	50	-
A13 – Greenacre Bowling Club	-	55	-	55	-	55	-
A14 – Strathfield High School (internal)	-	35	-	-	-	-	-
A15 – St Anne's School (internal)	-	35	-	-	-	-	-

*it is noted that the location Matthew Park no longer exists and has been developed for commercial retail use, and no other recreational areas are in the vicinity.

2.18 For the purpose of assessment of noise contributions specified under condition 2.17 of this consent, noise from the development shall be:

a) measured at the most affected point on or within the site boundary at the most sensitive locations to determine compliance with $L_{Aeq(15\text{-minute})}$ and $L_{Aeq(period)}$ noise limits;

b) measured in the free field at least 3.5 metres from any vertical reflecting surface in line with the worst-affected dwelling façade to determine compliance with $L_{A1(1\text{-}minute)}$ noise limits; and
c) subject to the modification factors provided in Section 4 of the *New South Wales Industrial Noise Policy* (EPA, 2017), where applicable.

Notwithstanding, should direct measurement of noise from the development be impractical, the Proponent may employ an alternative noise assessment method deemed acceptable by the EPA (refer to Section 11 of the *Noise Policy for Industry New South Wales* (EPA, 2000)). Details of such an alternative noise assessment method accepted by the EPA shall be submitted to the Planning Secretary prior to the implementation of the assessment method.

2.19 To avoid any doubt, the Proponent shall ensure that locomotives located on the site and associated with the operation of the project do not cause an exceedance of the noise limits specified under condition 2.17 of this approval. This shall include, where necessary, measures to mitigate and manage noise associated with locomotive idling and any shunting operations occurring on the site.

2.19A The Proponent shall implement noise mitigation measures generally in accordance with the measures identified in the document listed in condition 1.1j). In relation to the north-western noise wall, the Proponent shall implement as part of the design and construction of this wall, mitigation measures to minimise potential reflective noise on its western face.

Air Quality Impacts

2.20 The Proponent shall install, operate and maintain a meteorological monitoring station to monitor weather conditions representative of those on the site, in accordance with:
a) AM-1 Guide to Siting of Sampling Units (AS 2922-1987);
b) AM-2 Guide for Horizontal Measurement of Wind for Air Quality Applications (AS 2923-1987); and
c) AM-4 On-Site Meteorological Monitoring Program Guidance for Regulatory Modelling Applications.

The Proponent shall install the meteorological monitoring station prior to the commencement of site preparation or construction works and shall use the station to undertake the monitoring required under condition 3.1 of this approval, until all large exposed areas have either been landscaped or sealed.

This condition does not preclude the Proponent from reaching agreement with any other relevant party for the installation, operation and maintenance of a shared monitoring station, provided the outcomes of this condition are achieved.

During periods of repair or maintenance of the meteorological monitoring station, the Proponent may utilise weather data collected at the Canterbury Racecourse Automatic Weather Station, operated by the Bureau of Meteorology, or other nearby Bureau of Meteorology Stations in the event that the Canterbury station is offline.

Odour

2.21 The Proponent shall not permit any offensive odour, as defined under section 129 of the *Protection of the Environment Operations Act 1997*, to be emitted beyond the boundary of land owned by the Proponent (the site the subject of this approval).

Dust Emissions

2.22 The Proponent shall design, construct, commission, operate and maintain the project in a manner that minimises or prevents the emission of dust from the site including wind blown and traffic generated dust.

2.23 The Proponent shall take all practicable measures to ensure that all vehicles entering or leaving the site, carrying a load that may generate dust, are covered at all times, except during loading and unloading. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times, to the extent practicable.

2.24 All activities on the site shall be undertaken with the objective of preventing visible emissions of dust beyond the boundary of the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.

2.25 The Proponent shall manage, maintain and use internal haulage roads in order to prevent dust emissions. The measures to be implemented for the management of potential dust emissions from internal roads during construction shall be incorporated in the Construction Environmental Management Plan required under condition 6.3.

2.26 The Proponent shall apply and enforce a 25 km/ h speed limit on the site during site preparation and construction works to minimise the potential for dust generation.

2.27 The Proponent shall ensure that all vehicles and equipment directly associated with site preparation and construction works (as distinct from passenger vehicles) pass through a wheel wash prior to leaving the site.

Water Quality and Hydrological Impacts

2.28 Except as may be expressively provided under an Environment Protection Licence applicable to the project, the Proponent shall comply with section 120 of the *Protection of the Environment Operations Act 1997* which prohibits the pollution of waters.

2.29 Soil and water management controls shall be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during site preparation and construction activities, in accordance with Landcom's *Managing Urban Stormwater: Soils and Construction*.

2.30 All stockpiled construction materials shall be adequately located, stabilised and maintained to prevent erosion or dispersal of the materials.

2.31 The Proponent shall construct and maintain stormwater detention basins on the site, generally consistent with the basin sizes/ locations presented in the document referred to under conditions 1.1m) and 1.1n) of this approval. Opportunities to reuse stormwater from detention basins for ecological areas or for site operations shall be investigated during detailed design of the project, and where practicable, the Proponent shall utilise collected water preferentially to external potable water supplies for operational activities on the site, subject to testing to confirm the suitability of collected water quality.

2.32 All quarantine and machinery wash down waters and amenities wastewater shall be directed to sewer (subject to Sydney Water Corporation approval), or to an appropriately licensed liquid waste disposal facility.

2.33 The Proponent shall design, install, maintain and operate rainwater tanks for the collection of water for domestic uses on the site. Collected rainwater shall be used preferentially to external potable water supplies.

Heritage Impacts and Management

2.34 Except for necessary stabilisation works agreed in consultation with the OEH (Heritage Division), the Proponent is not permitted to destroy, modify or otherwise physically affect the Tarpaulin Factory as part of this approval. Any proposal to destroy, modify, redevelop, relocate or otherwise physically affect the Tarpaulin Factory, except for agreed stabilisation works, shall be the subject of further assessment and approval in accordance with the *Environmental Planning and Assessment Act 1979*.

2.35 The Proponent shall relocate and maintain the Pillar Water Tank to an appropriate location within the site, determined in consultation with the OEH (Heritage Division).

2.36 The Proponent shall undertake such works as may be necessary to stabilise the Pillar Water Tank as part of the relocation of that heritage item on the site. The Proponent shall consult with the OEH (Heritage Division) prior to undertaking any stabilisation works to ensure that the works do not adversely affect the heritage values of the item.

2.37 The Proponent shall relocate and maintain the Pedestrian Footbridge, if feasible, to an appropriate location within the site, determined in consultation with the OEH (Heritage Division). Where the Pedestrian Footbridge cannot be feasibly relocated within the site, the Proponent shall arrange for the relocation of the Pedestrian Footbridge to an external heritage organisation, determined in consultation with the OEH (Heritage Division).

2.38 The Proponent is permitted to destroy the Yard Master's Office, the Administration Building, and the Wagon Repair Shed (and associated Gantry Crane). Prior to the destruction of these items, the Proponent shall engage an independent, qualified heritage expert to prepare an archival recording of these items in accordance with OEH (Heritage Division) guidelines. Destruction of these items shall not commence until the OEH (Heritage Division) has indicated its satisfaction with the archival recordings and the recordings have been lodged with the Strathfield Public Library, or other repository agreed by the Planning Secretary.

Waste Generation and Management

2.39 All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.

2.40 The Proponent shall ensure that all liquid and/ or non-liquid waste generated, stored on the site or disposed of, is assessed and classified in accordance with the Waste Classification Guidelines (EPA, 2014).

2.41 The Proponent shall ensure that the transport of any hazardous and/ or industrial and/ or Group A waste from the site is conducted strictly in accordance with any requirements that may be specified by the EPA in relation to the transport of those wastes.

2.42 The Proponent shall ensure that contaminated areas of the site that are disturbed by construction works associated with the project are remediated prior to the commencement of project operations at these areas. All remediation works shall be undertaken in accordance with the requirements of the *Contaminated Land*

Management Act 1997 and *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (EPA, 2011).

2.43 Prior to the commencement of construction works associated with the project that may disturb contaminated areas of the site, the Proponent shall submit to the Planning Secretary a Site Audit Statement(s), prepared by an accredited Site Auditor under the Contaminated Land Management Act 1997, verifying that the area of the site on which construction is to be undertaken has been or can be remediated to a standard consistent with the intended land use. A final Site Audit Statement(s), prepared by an accredited Site Auditor, certifying that the contaminated areas have been remediated to a standard consistent with the intended land use and including any associated long term environmental management plan (LTEMP) is to be submitted to the Planning Secretary prior to operation of the remediated site(s).

2.43A Prior to commencement of works approved under DA 2016/132 for construction and operation of a garden centre and hardware and building supplies facility, a final Site Audit Statement for the Tarpaulin Factory Site must be prepared by an accredited Site Auditor certifying that the contaminated areas have been suitably remediated. The Site Audit Statement is to be submitted to the Secretary and Strathfield Council. In addition, a plan showing the extent of remediation within the Tarpaulin Factory Site is to be provided to the Secretary.

2.43B Within one month of remediation of the Tarpaulin Factory Site, a long-term contamination management plan is to be submitted to the Secretary for approval. The plan is to be implemented for the duration of operation of the development approved under DA 2016/132.

2.43C Prior to commencement of operation of the development permitted as part of the approval of MP 05_0147 MOD 14, a Validation Report is to be prepared by an Environmental Consultant, and a final Site Audit Statement for the warehousing precincts must be prepared by a NSW EPA accredited site auditor stating that the contaminated areas have been remediated to a standard suitable for the proposed use. The Validation Report and the Site Audit Statement are to be submitted to the Planning Secretary and Strathfield Council. A plan showing the extent of remediation in the warehousing precinct is also to be provided to the Planning Secretary.

2.44 The Proponent shall manage any asbestos or asbestos-contaminated materials that may be uncovered during the construction, commissioning and operation of the project strictly in accordance with the requirements under Protection of the Environment Operations (Waste) Regulation 2014 and any guidelines or requirements issued by the EPA in relation to those materials.

Visual Amenity and Urban Design

2.45 The Proponent shall ensure that all structures on the site are designed, constructed and maintained to maximise, where practicable, the use of natural ventilation and natural lighting, and to minimise energy consumption associated with heating, cooling and lighting.

2.46 The Proponent shall ensure that all external lighting installed as part of the project is mounted, screened, and directed in such a manner so as not to create a nuisance to surrounding land uses. The lighting shall be the minimum level of illumination necessary, and be in general accordance with the latest version of *AS 4282 – 1997 Control of the Obtrusive Effects of Outdoor Lighting*.

2.47 Prior to the commencement of construction of each warehouse associated with the project (refer to condition 1.6 of this approval), the Proponent shall submit, for the approval of the Planning Secretary, details of the external façade for the warehouse, including demonstration of the façade(s) on an external finishing board. The finishing board shall clearly show the materials to be used for the building façade including details of external treatments of the warehouse (such as painting, and other external features aimed at reducing the bulk of the building and to improve the general appearance of the project). The finishing board shall demonstrate that the external treatments of the warehouse are non-reflective and of sufficient design quality to minimise the visual affects of the project, as far as is reasonable and feasible.

Ecological Impacts

2.48 The Proponent shall implement all of the relevant actions for the site recommended in the *Management Plan for the Green and Golden Bell Frog Key Population at Greenacre* (DECC, May 2007), being:

a) creation of overwintering habitat as part of the two-hectare improved foraging habitat at the southern end of the site;
b) provision of linkages to the former RailCorp ponds; and
c) restrictions on the use of herbicides in known frog habitat and attainment of water quality standards for water discharged from the site.

These actions shall be incorporated within both the Construction Environmental Management Plan (refer to condition 6.2) and the Operation Environmental Management Plan (refer to condition 6.4) as relevant, including provisions for monitoring the outcomes of these actions and periodically reporting outcomes to OEH at a frequency agreed with OEH.

2.48A The Proponent shall implement the mitigation measures identified in Section 7.1 of the *ILC at Enfield Impact Assessment on Green and Golden Bell Frogs: Addition of Fill Material to Mt Enfield* (Biosphere Environmental Consultants Pty Ltd, 2011), supplementary letter of advice dated 10 January 2018 (Biosphere Consultants Pty Ltd, 2011), and the following:

a) the installation of an exclusion fence to help prevent frogs from entering the construction site;
b) the installation of silt fences and silt trapping devices prior to any earthworks, and the use of dust suppression methods throughout construction, to prevent wind-blown dust from entering the frog habitat area;
c) the establishment of run-off barriers between the construction areas and the frog habitat area, to prevent accidental spills and/or stormwater waste from entering the frog habitat area;
d) the installation of visual screens to minimise light spill into the frog habitat area, from night construction works;
e) the demarcation of the frog habitat area as a “no go” area, using barrier bunting and signs that indicate the significance of the area and that the site is off limits to people, machinery and plant equipment;
f) the installation of an exclusion fence to help prevent frogs from entering the operational areas;
g) the installation of diversion bunds to ensure hazardous liquids can never enter the frog habitat area; and
h) the installation of visual screens to minimise light spill into the frog habitat area, from trucks and plant equipment operating throughout the night.

These actions shall be incorporated within the Construction Environmental Management Plan (condition 6.2 of this approval) and the Operation Environment Management Plan (condition 6.4 of this approval), as relevant.

Hazards, Risk and Land Use Safety

2.49 All demolition work shall be carried out in accordance with *AS 2601-2001 The Demolition of Structures.*

2.50 The Proponent shall store and handle all dangerous goods (not being unopened, containerised goods), as defined by the Australian Dangerous Goods Code, strictly in accordance with:

a) all relevant Australian Standards;
b) a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and
c) the DECC's Environment Protection Manual Technical Bulletin *Bunding and Spill Management*.

In the event of an inconsistency between the requirements listed from a) to c) above, the most stringent requirement shall prevail to the extent of the inconsistency.

2.51 The Proponent shall investigate, in consultation with relevant emergency services, whether additional measures are required along Cosgrove Road, including parking restrictions, to ensure clear and safe access to the site in the event of an emergency.

2.51A Prior to commencement of spoil transportation and spoil disposal associated with Mt Enfield requiring the crossing of the Ethylene pipeline, the Proponent shall in consultation with Qenos Pty Ltd, determine truck crossing points of the pipeline and any required works to protect the pipeline.

Community Infrastructure and Enhancements

2.52 Prior to the commencement of operation of the project, the Proponent shall develop in consultation with Strathfield Municipal Council and Canterbury Bankstown Council, a **Community Enhancement Program** to fund (or provide in kind) community infrastructure and services in and around the project, with a specific focus on provision of such infrastructure and services for communities in Greenacre and South Strathfield. The Proponent shall contribute $1 million to the Program (in 2007 terms), with agreed works to be completed within two years of the commencement of construction of the project, unless otherwise agreed by the parties. Unless otherwise agreed by the Planning Secretary, funding for enhancement works shall be apportioned at the rate of 30% for works within the Strathfield local government area, and 70% for works within the Bankstown local government area. In the event that any aspect of the Program cannot be agreed between the parties, the matter may be referred to the Planning Secretary for resolution. The Planning Secretary's resolution of any disagreement shall be final and binding on all parties.

3. ENVIRONMENTAL MONITORING AND AUDITING

Meteorological Monitoring

3.1 From the commencement of site preparation and construction works associated with the project, the Proponent shall continuously monitor, utilising the meteorological monitoring station referred to under condition 2.20 of this approval, each of the parameters listed in Table 4, utilising the sampling method indicated and applying a 15-minute average period to all results, and recording data in units specified in the Table.

Table 4 – Meteorological Monitoring

Parameter	Units of Measure	Sampling Method*	Method
Temperature at two metres	^{o}C	AM-4	USEPA (2000) EPA 454/ R-99-005
Temperature at ten metres	^{o}C	AM-4	USEPA (2000) EPA 454/ R-99-005
Wind speed at ten metres	ms^{-1}	AM-2 and AM-4	AS 2923-1987; USEPA (2000) EPA 454/R-99-005
Wind direction at ten metres	^{o}	AM-2 and AM-4	AS 2923-1987; USEPA (2000) EPA 454/R-99-005
Solar radiation	Wm^{-2}	AM-4	USEPA (2000) EPA 454/ R-99-005

*refer *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA, 2005)*

During periods of repair or maintenance of the meteorological monitoring station, the Proponent may utilise weather data collected at the Canterbury Racecourse Automatic Weather Station, operated by the Bureau of Meteorology, or other nearby Bureau of Meteorology Stations in the event that the Canterbury station is offline.

Construction Dust Monitoring

3.2 The Proponent shall, from the commencement of soil disturbing works on the site until all large exposed areas have either been landscaped or sealed, continuously monitor ambient dust concentrations (PM_{10}) at two of the most-affected residential receptor(s) to the site (with monitoring undertaken either on the boundary of the site or within the affected residential areas) employing the sampling and analysis methods specified under AM-18 or AS3580.9.8 or as otherwise agreed by the Planning Secretary. Results of dust monitoring shall be recorded in µgm-3 and shall be utilised for the purpose of site preparation and construction dust management under condition 6.3(e) of this approval.

Noise Auditing

3.3 Within 90 days of the project reaching annual throughput of 50,000 TEU, 150,000 TEU and 250,000 TEU, and within commencement of operations in Empty Container Storage Area A, or at such other time as may be directed or agreed by the Planning Secretary, and during a period in which the project is operating under normal operating conditions, the Proponent shall undertake a program to confirm the noise emission performance of the project. The program shall include, but not necessarily be limited to:

a) noise monitoring, consistent with the guidelines provided in the *New South Wales Industrial Noise Policy* (EPA, 2000), to assess compliance with condition 2.17 of this consent;
b) methodologies, locations and frequencies for noise monitoring;
c) identification of monitoring sites at which pre- and post-project development noise levels can be ascertained;
d) details of any complaints received in relation to noise generated by the project;
e) an assessment of night-time use of audible alarm systems;
f) an assessment of the effectiveness of stacked empty containers as acoustic barriers in Empty Container Storage Area A;
g) details of any noise mitigation measures and timetables for implementation;
h) a statement of whether the site is in compliance with the noise limits outlined in condition 2.17; and
i) recommendations and timetables for implementation for any reasonable and feasible additional measures necessary to ensure compliance with the relevant noise-related conditions of this approval.

3.4 Within 28 days of conducting the noise monitoring referred to under condition 3.3 of this approval, the Proponent shall provide the Planning Secretary with a copy of the report. If the noise monitoring report identifies any non-compliance with the noise limits specified under this approval, the Proponent shall detail what additional measures would be implemented to ensure compliance, clearly indicating who would implement these measures, when these measures would be implemented, and how the effectiveness of these measures would be measured and reported to the Planning Secretary.

3.5 Following consideration of the outcomes of the noise audits referred to under conditions 3.3 and 3.4 of this approval, the Planning Secretary may require the Proponent to implement additional noise mitigation, monitoring or management measures to address noise associated with the project. The Planning Secretary ary may require any or all of the measures proposed by the Proponent in the noise audit report, or other measures considered appropriate by the Planning Secretary (including on-site and off-site acoustic treatments, noise bunding, noise walls or noise attenuation works for plant and equipment) to be implemented. The Proponent shall implement the measures required by the Planning Secretary y within such period as the Planning Secretary may specify.

Traffic Monitoring and Auditing

3.6 The Proponent shall develop and implement a **Traffic and Capacity Monitoring Program** to monitor the throughput and traffic generation of the project. The Program shall include, but not necessarily be limited to:

a) provisions for monitoring the throughput of the project;
b) provisions for representative monitoring the traffic generation of the project, with reference to traffic generation as a function of project throughput, type of road transport employed, hours of traffic movements and intended road traffic destinations;
c) provisions for periodic monitoring of traffic movements generated by the project in the surrounding road network, with a particular focus on the residential areas of Greenacre to the west of the project, generally between Roberts Road, Boronia Road and the Hume Highway, and principal road transport routes to and from the site; and
d) a framework for recording and reporting the outcomes of the Program and a system for considering data generated through the Program.

3.7 Within 90 days of the project reaching annual throughput of 50,000 TEU, 150,000 TEU and 250,000 TEU, or as may be directed or agreed by the Planning Secretary, and during a period in which the project is operating under normal operating conditions, a **Traffic Audit** of the project shall be undertaken by an independent qualified person(s) approved by the Planning Secretary. The Audit shall include, but not necessarily be limited to:

a) assessment of the traffic performance of the project against the predictions made in the documents referred to under condition 1.1 of this approval;
b) consideration of the results of the Traffic and Capacity Monitoring Program required under condition 3.6 of this approval;
c) consideration of the effectiveness of the traffic management measures implemented by the Proponent and the measures required under this approval;
d) consideration of traffic-related issues raised by the RMS, Canterbury Bankstown Council and Strathfield Municipal Council;
e) consideration of the traffic-related complaints recorded in accordance with condition 5.3 of this approval;

f) findings and recommendations with respect to the traffic performance of the project and any additional measures that may be required to manage traffic associated with the project.

3.8 Within 28 days of conducting the traffic auditing referred to under condition 3.7 of this approval, the Proponent shall provide the Planning Secretary with a copy of the audit report. If the audit report identifies any non-compliance with the traffic predictions, principal heavy vehicle routes or local area traffic management measure outlined in the documents referred to under condition 1.1, or specified under this approval, the Proponent shall detail what additional measures would be implemented to ensure compliance, clearly indicating who would implement these measures, when these measures would be implemented, and how the effectiveness of these measures would be measured and reported to the Planning Secretary.

3.9 Following consideration of the outcomes of the traffic audits referred to under conditions 3.7 and 3.8 of this approval, the Planning Secretary may require the Proponent to implement additional traffic mitigation, monitoring or management measures to address traffic associated with the project. The Planning Secretary may require any or all of the measures proposed by the Proponent in the traffic audit report, or other measures considered appropriate by the Planning Secretary (including additional local area traffic management measures or on-site traffic management controls) to be implemented. The Proponent shall implement the measures required by the Planning Secretary within such period as the Planning Secretary may specify.

4. COMPLIANCE MONITORING AND TRACKING

Compliance Tracking Program

4.1 The Proponent shall develop and implement a **Compliance Tracking Program** to track compliance with the requirements of this approval. The Program shall include, but not necessarily limited to:

a) provisions for periodic review of the compliance status of the project against the requirements of this approval;
b) provisions for periodic reporting of compliance status to the Planning Secretary;
c) a program for independent environmental auditing at least annually, or as otherwise agreed by the Planning Secretary, in accordance with *ISO 19011:2002 - Guidelines for Quality and/ or Environmental Management Systems Auditing*; and
d) mechanisms for rectifying any non-compliance identified during environmental auditing or review of compliance.

5. COMMUNITY INFORMATION, CONSULTATION AND INVOLVEMENT

5.1 Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.

Complaints and Enquiries Procedure

5.2 Prior to the commencement of construction of the project, the Proponent shall ensure that the following are available for community complaints and enquiries for the life of the project (including construction and operation):

a) a telephone number on which complaints and enquiries about construction and operational activities at the site may be registered;
b) a postal address to which written complaints and enquires may be sent; and
c) an email address to which electronic complaints and enquiries may be transmitted.

The telephone number, the postal address and the email address shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public, and which clearly indicates the purposes of the sign. This information is also to be provided on the Proponent's website.

5.3 The Proponent shall record details of all complaints received through the means listed under condition 5.2 of this approval in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to:

a) the date and time, where relevant, of the complaint;
b) the means by which the complaint was made (telephone, mail or email);
c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
d) the nature of the complaint;
e) record of operational and meteorological condition contributing to the complaint;
f) any action(s) taken by the Proponent in relation to the complaint, including any follow-up contact with the complainant; and
g) if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken.

The Complaints Register shall be made available for inspection by the Planning Secretary upon request.

Provision of Electronic Information

5.4 The Proponent shall establish and maintain a new website, or dedicated pages within its existing website for the provision of electronic information associated with the project. The Proponent shall publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to:

a) a copy of the documents referred to under condition 1.1 of this approval, and any documentation supporting modifications to this approval that may be granted from time to time;
b) a copy of this approval and each relevant environmental approval, licence or permit required and obtained in relation to the project;
c) a copy of each strategy, plan, program and audit required under this approval; and
d) the outcomes of compliance tracking in accordance with condition 4.1 of this approval.

6. ENVIRONMENTAL MANAGEMENT

Environmental Representative

6.1 Prior to the commencement of operation of the project, the Proponent shall nominate a suitably qualified and experienced Environmental Representative(s) for the approval of the Planning Secretary. The Proponent shall employ the Environmental Representative(s) on a full-time basis, or as otherwise agreed by the Planning Secretary, during the operation of the project. The Environmental Representative shall be:

a) the primary contact point in relation to the environmental performance of the project;
b) responsible for all management plans and monitoring programs required under this approval;
c) responsible for considering and advising on matters specified in the conditions of this approval, and all other licences and approvals related to the environmental performance and impacts of the project;
d) responsible for receiving and responding to complaints in accordance with condition 5.2 and 5.3 of this approval; and

e) given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.

The Proponent shall notify the Planning Secretary of any changes to that appointment that may occur from time to time.

Construction Environmental Management Plan

6.2 Prior to the commencement of site preparation works or construction of the project, the Proponent shall prepare and submit for the approval of the Planning Secretary a **Construction Environmental Management Plan** to detail an environmental management framework, practices and procedures to be followed during site preparation and construction of the project. The Plan shall be prepared in accordance with *Guideline for the Preparation of Environmental Management Plans* (DIPNR 2004) and shall include, but not necessarily be limited to:

a) a framework consistent with that presented in Chapter 21 of the document referred to under condition 1.1b) of this approval;
b) a description of all activities to be undertaken on site during site establishment and construction of the project including an indication of stages of construction, where relevant;
c) statutory and other obligations that the Proponent is required to fulfil during site establishment and construction, including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;
d) specific consideration of measures to address any requirements of the EPA during site establishment and construction;
e) a description of the roles and responsibilities for all relevant employees involved in the site establishment or construction of the project.
f) details of how the environmental performance of the site preparation and construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the Plan:
    i) measures to monitor and manage dust emissions;
    ii) measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and/ or waters during construction activities; and
    iii) measures to monitor and control noise emissions during construction works;
g) a description of the roles and responsibilities for all relevant employees involved in site preparation and construction of the project and a program for how these employees will be trained in responsibilities identified in the plan;
h) complaints handling procedures to be applied during operation of the project (conditions 5.2 and condition 5.3 of this approval);
i) the issue-specific management plans listed under condition 6.3 of this approval.

The Construction Environmental Plan shall be made available for inspection by the public upon request following its approval by the Planning Secretary.

6.3 As part of the Construction Environmental Management Plan for the project, required under condition 6.2 of this approval, the Proponent shall prepare and implement the following Management Plans:

a) a **Construction Noise Management Plan** to outline construction noise mitigation, monitoring and management measures to be implemented to

minimise noise impacts during construction of the project. The Plan shall include, but not necessarily be limited to:

i) details of construction activities and a schedule for construction works;
ii) identification of construction activities that have the potential to generate noise and/ or vibration impacts on surrounding land uses, particularly residential areas;
iii) where the relevant construction noise goals contained in the *Noise Management Guideline – Construction Noise* (formerly published as Chapter 171 of the *Environmental Noise Control Manual*) are predicted to be exceeded at sensitive receivers, provision for the application of all practicable and reasonable noise mitigation measures to seek to achieve the relevant construction noise goals;
iv) procedures for notifying residents of construction activities that are likely to effect their noise and vibration amenity, as well as procedures for dealing with and responding to noise complaints; and
v) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, how the results of this monitoring would be recorded; and, if any non-compliance is detected.

b) Construction traffic measures including:
   i. a Construction Traffic Management Protocol to detail how heavy vehicle movements associated with the project will be managed during construction. The Protocol shall specifically address the movement of oversize loads to and from the site, the management of construction traffic, restrictions to the hours of heavy vehicle movements to avoid road use conflicts, and the transport of construction waste materials; and
   ii. a Driver's Code of Conduct which details traffic management measures to be implemented during construction to:
      - minimise impacts of the project on the local and regional road network,
      - minimise conflicts with other road users,
      - ensure truck drivers use specific routes and access points, including no left turn access from Cosgrove Road, and
      - minimise traffic noise, particularly during night times hours;

c) a **Heritage Interpretation Plan and Strategy** to detail how heritage items to be retain on-site will be protected during site preparation and construction, and how relocated heritage items will be protected and maintained during those works. The Plan shall include a strategy for the on-going management and interpretation of heritage items and values on the site, and shall be prepared in accordance with OEH (Heritage Division) guidelines;

d) a **Landscape and Ecological Area Management Plan** to detail how the site will be landscaped and maintained. The Plan shall be generally consistent with the Landscape Masterplan presented in the document referred to under condition 1.1b) of this approval and shall include, but not necessarily be limited to:

i) provision for the use of locally-endemic native species for landscaping the site;
ii) consideration of landscaping locations and densities to maximise visual screening of the project from residential receptors and public open space;
iii) measures to maximise the retention of locally-endemic native species existing on the site, and removal of weeds and non-indigenous vegetation; and
iv) measures for the enhancement, revegetation and on-going management of the Ecological Area on the site, including measures to provide suitable habitat for *Litoria Aurea*;

e) a **Construction Dust Management Protocol** to detail how dust impacts will be mitigated, monitored and managed during construction of the project. The Plan shall include procedures for the identification of situations in which site preparation or construction works may contribute to an ambient PM_{10} concentration (24-hour) of greater than 50 μgm^{-3} at any off-site residential receptor, with details of measures to be implemented (including alteration or cessation of works, as may be relevant) to prevent or minimise exceedance of this criterion, in so far as the exceedance may relate to activities associated with the project.

f) A **Mt Enfield Stabilisation Management Plan** to detail how the batters of Mt Enfield and associated drainage will be managed during construction and until such time as it is stabilised with vegetation. The plan shall include but not be limited to:

(i) measures to prevent soil erosion and the discharge of sedimentation to lands or waters, including to the Green and Golden Bell Frog Habitat Creation Area and Cox's Creek;

(ii) identification of where runoff from Mt Enfield is to be directed to, indicating ponding and flow paths to ensure runoff volume and increased flow velocity has been provided for, with the objective of not exceeding current rates;

(iii) measures to mitigate potential dust impacts on sensitive receivers including the Green and Golden Bell Frog Habitat Creation Area and surrounding residences; and

(iv) measures for the enhancement, revegetation and on-going landscape management of the Mt Enfield site, undertaken in consultation with Strathfield Municipal Council and Canterbury Bankstown Council, and the local community.

The ongoing management of drainage structures and landscaping associated with Mt Enfield shall be incorporated into the Operation Environmental Management Plan required under condition 6.4 of this approval.

g) Tarpaulin Factory Area Earthworks Environmental Management Plan which shall include but not be limited to:

(i) the measures contained in the letter – Green and Golden Bell Frog Conservation Measures Tarpaulin Shed Site Enfield, prepared by Biosphere Environmental Consultants, 27 November 2016;

(ii) measures to minimise dust emissions in accordance with conditions 2.22 to 2.27 including measures to mitigate potential dust impacts on Green and Golden Bell Frog habitat;

(iii) measures to minimise soil erosion in accordance with condition 2.29 and to ensure only clean surface water flows are discharged to the frog ponds;

(iv) management of stockpiles in accordance with condition 2.30;

(v) management of waste and remediation of the site in accordance with conditions 2.39 to 2.42, 2.44 and the Remediation Action Plan (RAP), 127 Cosgrove Road, South Strathfield, NSW, Flower Power Group, prepared by ZOIC, February 2017 including air quality monitoring for asbestos;

(vi) measures to verify that imported material is consistent with that specified in the RAP;

(vii) landscaping of disturbed areas in accordance with the Landscape and Ecological Area Management Plan under condition 6.3(d);

(viii) protection of heritage items including the relocated Pillar Water Tank; and

(ix) unexpected finds protocol.

A copy of the approved Tarpaulin Factory Area Earthworks Environmental Management Plan is to be provided to Strathfield Council.

h) a Fill Importation Protocol (FIP) outlining the requirements of the imported fill, including the source and type, and containing the requirement to place and compact imported material as fill immediately upon arrival to the site. The FIP is to include the requirement that only virgin excavated natural material/ excavated natural material can be imported from off-site. All bulk earthworks should be undertaken in accordance with the approved FIP.

The Construction Environmental Management Plan required under this condition and Condition 6.2 shall be updated (where necessary) to reflect any changes arising from modifications to this approval.

Operation Environmental Management Plan

6.4 Prior to the commencement of operation of the project, the Proponent shall prepare and submit for the approval of the Planning Secretary an **Operation Environmental Management Plan** (OEMP) to detail an environmental management framework, practices and procedures to be followed during the operation of the project. The Plan shall be consistent with the Department's *Guideline for the Preparation of Environmental Management Plans* (DIPNR 2004), and shall include, but not necessarily be limited to:

a) a framework consistent with that presented in Chapter 21 of the document referred to under condition 1.1b) of this approval;
b) a description of all activities to be undertaken on the site during operation of the project;
c) statutory and other obligations that the Proponent is required to fulfil during operation, including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;
d) specific consideration of measures to address the reasonable requirements of Strathfield Municipal Council, Canterbury Bankstown Council and the EPA during operation;
e) details of how the environmental performance of operations will be monitored, and what actions will be taken to address identified adverse environmental impacts;
f) a description of the roles and responsibilities for all relevant employees involved in the operation of the project and a program for how these employees will be trained in responsibilities identified in the plan;
g) complaints handling procedures to be applied during operation of the project (conditions 5.2 and condition 5.3 of this approval).
h) the issue-specific management plans listed under condition 6.5 of this approval.

6.5 As part of the Operation Environmental Management Plan for the project, required under condition 6.4 of this approval, the Proponent shall prepare and implement the following Management Plans:

a) an **Operation Noise Management Plan** to outline monitoring, management procedures and measures to minimise operational noise impacts associated with the project, including traffic-related noise. The Plan shall include, but not necessarily be limited to:
   i) identification of all relevant receivers and the applicable criteria at those receivers commensurate with the noise limits specified under this approval;

ii) identification of activities that will be carried out in relation to the project and the associated noise sources;
iii) assessment of project noise impacts at the relevant receivers against the noise limits specified under this approval;
iv) details of management measures, methods and procedures that will be implemented to control individual and overall noise emissions from the site and specific land uses to ensure compliance with condition 2.17;
v) details of the management measures and procedures that will be implemented in Empty Container Storage Areas A and B to ensure that acoustic barriers constructed from empty storage containers are established at the correct time, height, length, and location to ensure compliance with condition 2.17;
vi) details of the management measures that will be undertaken to ensure that activities undertaken in Empty Container Storage Area B in the area to the north of the northern noise wall, including the restriction of container stacking, comply with the requirements of condition 2.17;
vii) development of reactive and pro-active strategies for dealing promptly with any noise complaints;
viii) noise monitoring and reporting procedures; and
ix) regular internal audits of compliance of all plant and equipment with acceptable design noise.

b) an **Operation Traffic Management Plan** to outline measures to minimise and manage any impacts from the operation of the project on the local road network. The Plan shall include, but not necessarily be limited to:
i) a driver education program to ensure that heavy vehicles comply with the requirements of this approval and the commitments made in the documents referred to under condition 1.1, particularly with respect to heavy vehicle routes;
i-a) a Driver's Code of Conduct which details traffic management measures to be implemented during operation to:
- minimise impacts of the project on the local and regional road network,
- minimise conflicts with other road users,
- ensure truck drivers use specific routes and access points, including no left turn access from Cosgrove Road, and
- minimise traffic noise, particularly during night times hours;

ii) movement scheduling where practicable to reduce impacts during sensitive time periods;
iii) specific measures for ensuring that all heavy vehicle operators associated with the project are aware of and implement the Plan;
iv) a system for identifying and ensuring conformance with the Plan, including conformance monitoring, procedures for implementing and monitoring corrective and preventative action, and penalties for breaches of the Plan; and
v) a continuous improvement process for assessing Plan effectiveness and implementing improvements to the Plan.

c) **a Long Term Environmental Management Plan**, where required to manage interactions with the site as remediated. The Plan must be prepared to the satisfaction of the Planning Secretary, and must:
(i) be prepared by a suitably qualified and experienced person whose appointment has been endorsed by the Planning Secretary in consultation with EPA;
(ii) be submitted to EPA for review and be approved by the Planning Secretary within one month of the completion of remediation works, unless otherwise agreed by the Planning Secretary; and

(iii) include, but not be limited to:

- a description of the nature and location of any contamination remaining on site;
- provisions to manage and monitor any remaining contamination, including details of any restrictions placed on the land to prevent development over the containment cell;
- a description of the procedures for managing any leachate generated from the containment cell, including any requirements for testing, pumping, treatment and/or disposal;
- a description of the procedures for monitoring the integrity of the containment cell;
- a surface and groundwater monitoring program;
- mechanisms to report results to relevant agencies;
- triggers that would indicate if further remediation is required; and
- details of any contingency measures that the Applicant is to carry out to address any ongoing contamination.

Upon completion of the remediation works, the Applicant must manage the site in accordance with the LTEMP and any on-going maintenance of remediation notice issued by EPA under *the Contaminated Land Management Act 1997*.

6.6 The Operation Environmental Management Plan required under conditions 6.4 and 6.5 shall be periodically reviewed and maintained, to reflect any phasing of implementation of the project, and any operational changes that may be made from time to time, and updated (where necessary) to reflect any changes arising from modifications to this approval.

7. ENVIRONMENTAL REPORTING

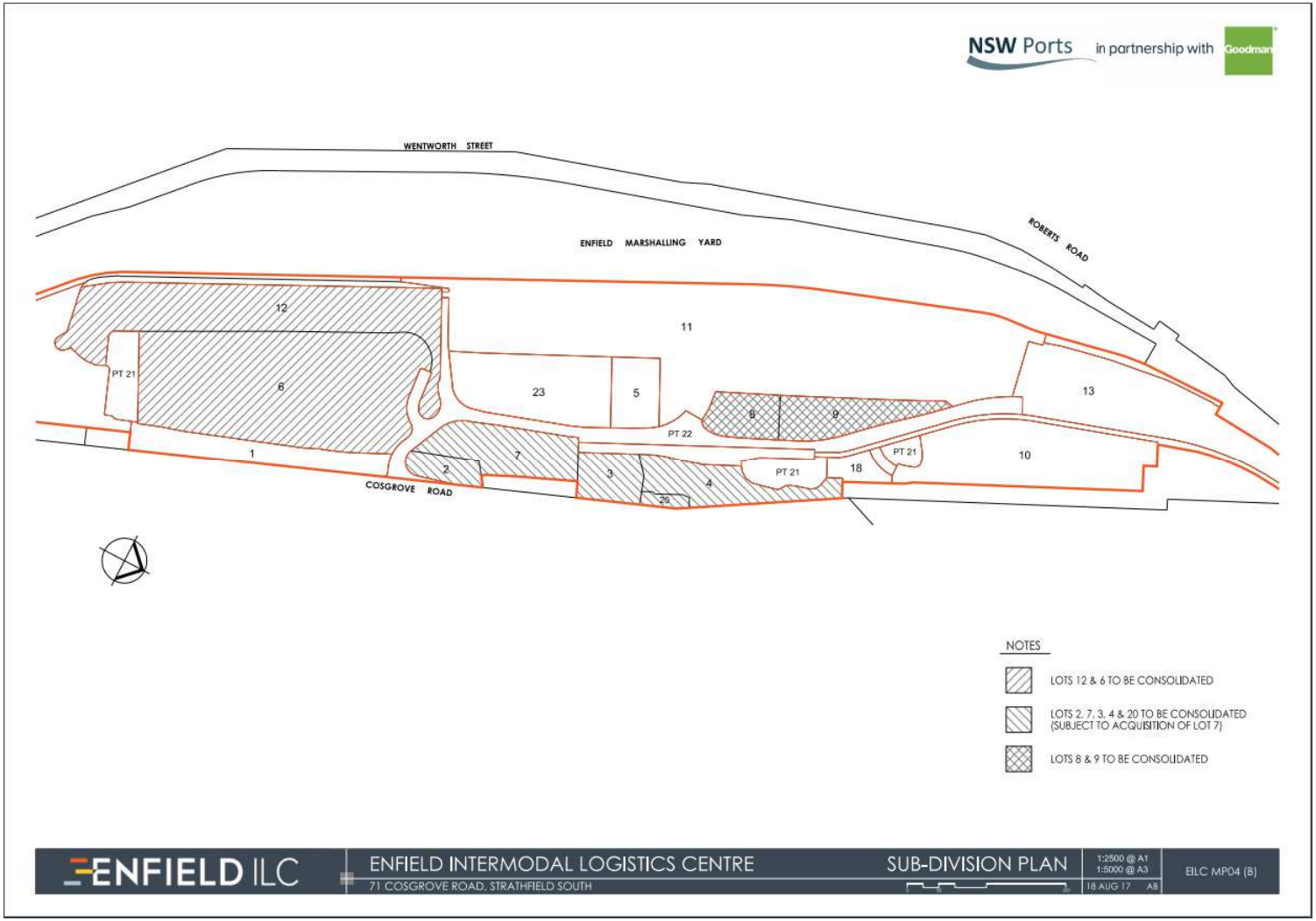
Incident Reporting

7.1 The Proponent shall notify the Planning Secretary of any incident with actual or potential significant off-Site impacts on people or the biophysical environment as soon as practicable after the occurrence of the incident. The Proponent shall provide written details of the incident to the Planning Secretary within seven days of the date on which the incident occurred.

7.2 The Proponent shall maintain a register of accidents, incidents and potential incidents with actual or potential significant off-Site impacts on people or the biophysical environment. The register shall be made available for inspection at any time by the independent qualified person or team conducting the Environmental Audit and/or the Planning Secretary.

7.3 The Proponent shall meet the requirements of the Planning Secretary to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition 7.1 of this consent, within such period as the Planning Secretary may agree.

APPENDIX 1
PLAN OF SUBDIVISION



APPENDIX B

Incident and Hazard Report Form

Qanstruct

INCIDENT REPORT FORM 25

Incident Details	
Date of Incident	
Site & Address where Incident occurred	
Person/s Involved in the Incident (name & company)	

Incident Investigation – Site Manager & OHS Rep will be involved in all site incident investigations. The Construction Manager will also be involved in the incident investigation of HIGH & MODERATE potential risk incidents.	
Investigation Team (names)	
In which part of the workplace did the incident occur	
Job or task being done by the person at the time of the incident	
What happened unexpectedly (e.g. brake failed on a forklift, or slipped on wet floor etc)	
How exactly was the injury or damage sustained (e.g. bruised leg when fell to the floor etc)	
What preventive controls were in place that failed (e.g. guarding, harness etc)	
How did these controls fail (e.g. guard failed, rope became loose etc)	

Immediate Contributory Factors (assess the risks associated with the hazards identified). **Be factual.**
Additional Contributory Factors (assess the risks associated with the hazards identified). **Be factual.**

Details of Risk (refer to tables at end of sheet)	
Actual/ Potential Risk Class & Deadlines (choose whichever is highest)	☐ High (1) - primary cause/s must be resolved IMMEDIATELY. ☐ Medium (2) - primary cause/s must be resolved WITHIN 24 HOURS ☐ Low (3) - primary cause/s must be resolved WITHIN 7 DAYS

Was the incident a result of:
- ☐ Inadequate process/es, follow up required is to AMEND PROCESS/ES (inc. SWMS); or
- ☐ Inadequate compliance with process/es, follow up requires is to TOOLBOX WORKERS

HIERARCHY OF CONTROLS

Most Preferred ← → Least Preferred

Elimination | **Substitution** | **Engineering** | **Administration** | **PPE**

List the Actions that will be Taken to prevent a Reoccurrence (considering the Hierarchy of Controls)	Who	Date Completed
Does the SWMS require changing?	☐ No ☐ Yes, If yes ..... [date] SWMS has been updated to control this hazard.	
Does the PRA require changing?	☐ No ☐ Yes, If yes ..... [date] PRA has been updated to control this hazard	

Subcontractor's Supervisor's/ Manager's Close Out		Name:	
Signature		Date	

Qanstruct OHS Representative's Close Out		Name:	
Signature		Date	

Qanstruct Manager's Close Out		Name:	
Signature		Date	

Level	Description of Consequence
High (1) (High level of harm)	Potential death, permanent disability or major structural failure/damage. Off-site environmental discharge/release not contained and significant long-term environmental harm.
Medium (2) (Medium level of harm)	Potential temporary disability or minor structural failure/damage. On-site environmental discharge/release contained, minor remediation required, short-term environmental harm.
Low (3) (Low level of harm)	Incident that has the potential to cause persons to require first aid. On-site environmental discharge/release immediately contained, minor level clean up with no short-term environmental harm.

Consequence	Likelihood / Probability		
	Likely	Moderate	Unlikely
High (1)	1	1	2
Medium (2)	1	2	3
Low (3)	2	3	3

APPENDIX C

Complaint Form

Qanstruct

Complaint Form

FORM 55

COMPLAINT REPORT FORM

Workplace: _____ **Date:** _____ / _____ / _____ **Time:** _____ am/pm

Supervisor: _____

Nature of complaint: _____

How was complaint lodged? _____

Complaint Details		Summary of Complaint
Print Name	Contact Details	

Comments, Points Raised and any Follow Up Required:

Corrective Action To Be Taken	Action by	Action Complete	
		Sign off	Date

APPENDIX D

Construction Dust Management Protocol

ENFIELD INTERMODAL LOGISTICS CENTRE

Construction Dust Management Protocol

Prepared for:

Goodman Limited
Level 17, 60 Castlereagh St
Sydney NSW 2000

SLR Ref: 630.12792-R03
Version No: -v1.2
January 2020

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 Limited (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
630.12792-R03-v1.2	20 January 2020	Varun Marwaha	Kirsten Lawrence	Varun Marwaha
630.12792-R03-v1.1	17 October 2019	Varun Marwaha	Kirsten Lawrence	Varun Marwaha
630.12792-R03-v1.0	10 October 2019	Varun Marwaha	Kirsten Lawrence	Varun Marwaha

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1 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Goodman Limited (Goodman) to prepare a Construction Dust Management Protocol (CDMP) for the construction of Precinct 'E' (hereafter 'the Project') of the Enfield Intermodal Logistic Centre (ILC) located to the west of Cosgrove Road and to the north of Punchbowl Road in South Strathfield, New South Wales (NSW).

A CDMP is required for the Project under Condition 6.3 (e) of Development Consent MP 05_0147, granted in August 2018 by the Department of Planning, Industry and Environment (DPIE) for the construction and operation of the Enfield ILC.

Specifically, Condition 6.3 (e) requires:

> *"A Construction Dust Management Protocol to detail how dust impacts will be mitigated, monitored and managed during construction of the project. The Plan shall include procedures for the identification of situations in which site preparation or construction works may contribute to an ambient PM_{10} concentration (24-hour) of greater than 50 µg/m^3 at any off-site residential receptor, with details of measures to be implemented (including alteration or cessation of works, as may be relevant) to prevent or minimise exceedance of this criterion, in so far as the exceedance may relate to activities associated with the project."*

This CDMP details the following:

- Identification of potential sources of dust emissions associated with the Project (**Section 3**);
- Review of relevant approval conditions, regulatory requirements and criteria relating to dust emissions (**Section 4**);
- A description of the existing environment, including the potential impacts of local meteorology on the dispersion of any dust emissions generated by the construction works and how background particulate levels have the potential to impact cumulatively with dust emissions from the Project (**Section 5**);
- Dust mitigation measures to be implemented during normal and abnormal operations of the Project (**Section 6**);
- Investigation and response procedures in the event of a complaint about dust emissions from the Project (**Section 7**);
- Dust monitoring requirements (**Section 8**);
- Roles and responsibilities for the implementation and oversight of this CDMP (**Section 9**); and
- Procedures for the review and continuous improvement of this CDMP (**Section 10**).

1.1 Background

SLR completed an Air Quality Impact Assessment (AQIA) for the construction and operation of the Enfield ILC in February 2018 (SLR 2018, hereafter 'Enfield ILC AQIA'). The Enfield ILC AQIA concluded that there is a low risk of construction dust emissions causing nuisance impacts at the identified off-site sensitive receptor locations. Further, it concluded that these impacts will be temporary in nature and generally can be managed through the implementation of appropriate mitigation measures. The implementation of mitigation measures listed in this CDMP will assist in reducing dust emissions and minimise the potential for adverse health or nuisance impacts at sensitive receptors.

1.2 Objectives

The objectives of this CDMP are as follows:

- Maintain acceptable levels of amenity for surrounding residents;
- Ensure compliance with relevant ambient air quality criteria for particulate matter at surrounding sensitive 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 Project Overview

2.1 Site Location and Surrounding Land Uses

The Enfield ILC site is located approximately 15 kilometres (km) from the Sydney Central Business District by road and 18 km from Port Botany by rail. It is located within Strathfield South on land generally bound by Cosgrove Road to the east, Punchbowl Road to the south, the Port Botany Freight Rail Line to the west and Roberts Road to the north (see **Figure 1**). It covers an area of approximately 60 hectares and is approximately 0.5 km in width and over 2 km in length. The Enfield ILC has the legal description Lots 1 - 23 DP 1183316. The main entrance to the Enfield ILC is via Cosgrove Road.

The Enfield ILC is approved to develop warehouse distribution centres within nine precincts as shown in **Figure 2**. The size of Precinct E, the subject of this CDMP, is shown in **Table 1** along with the building areas.

Table 1 Details of Precinct E

Precinct	Lot / DP	Site Area (m^2)	Building Area (m^2)	Building Height (m)
E	Lot 100, DP 1251048	21,900	7,604	13.7

The nearest residential receptors to the Precinct E site boundary are located approximately 425 m east on Dean Street and approximately 325 m southeast on Madeline Street. Madeline Street and Cosgrove Road will be used as the exit/entrance point for trucks and equipment used during the Project. The nearest sensitive receptors to this access point are located approximately 350 m away.

As shown in **Figure 1,** the Enfield ILC is located within the Enfield Industrial Estate. Within the area surrounding the Enfield ILC, the predominant land uses include industrial warehouses and factories. Industrial premises identified within the Enfield industrial estate with the potential to give rise to cumulative dust impacts with the construction of Precinct E are:

- Boral Asphalt Plant;
- Weston Milling Plant; and
- Bulk railyard.

In addition, there is potential for cumulative impacts to occur from construction activities being undertaken during the same period at other precincts within the Enfield ILC.

Figure 1 Regional Setting of the Enfield Intermodal Logistics Centre

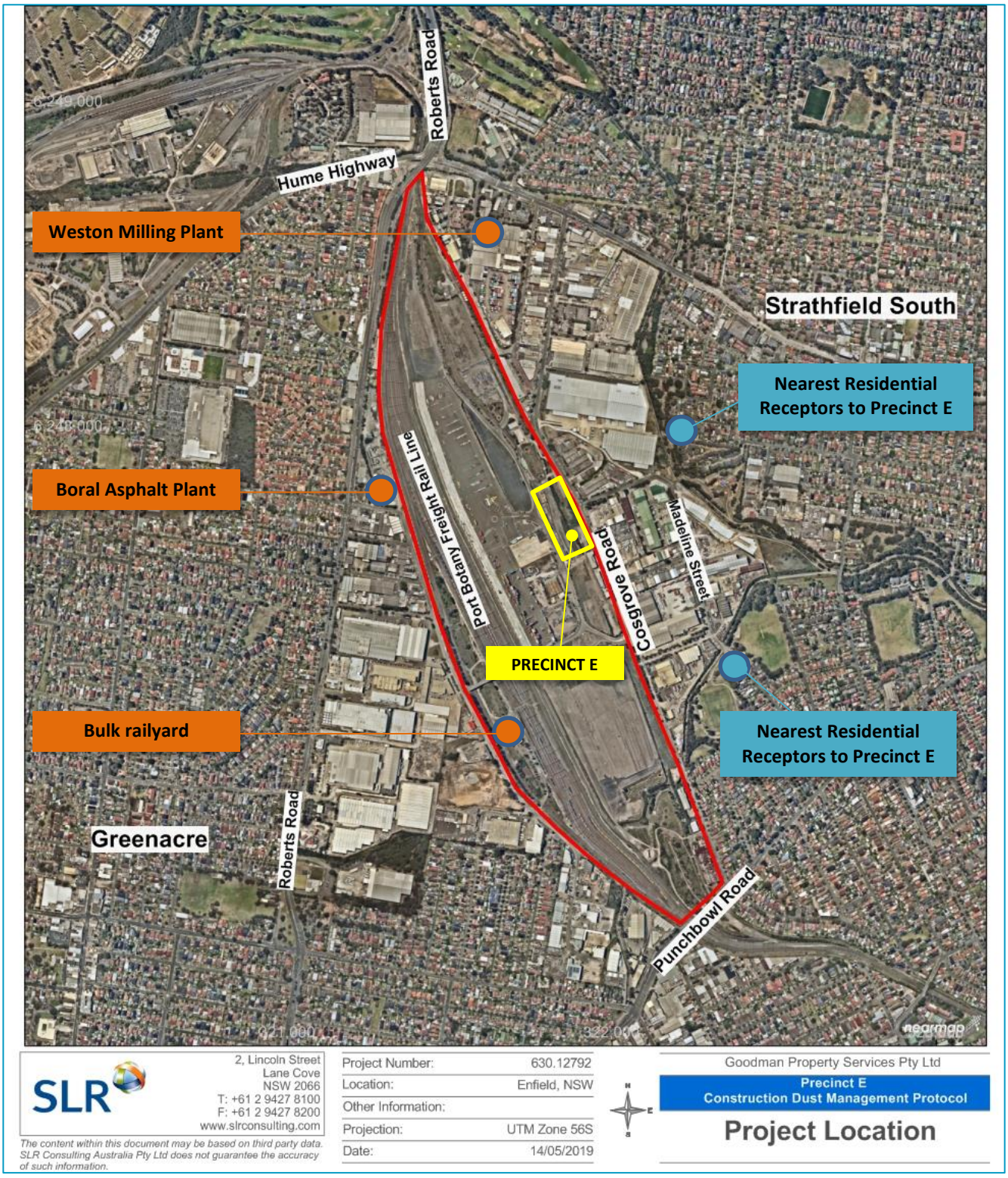
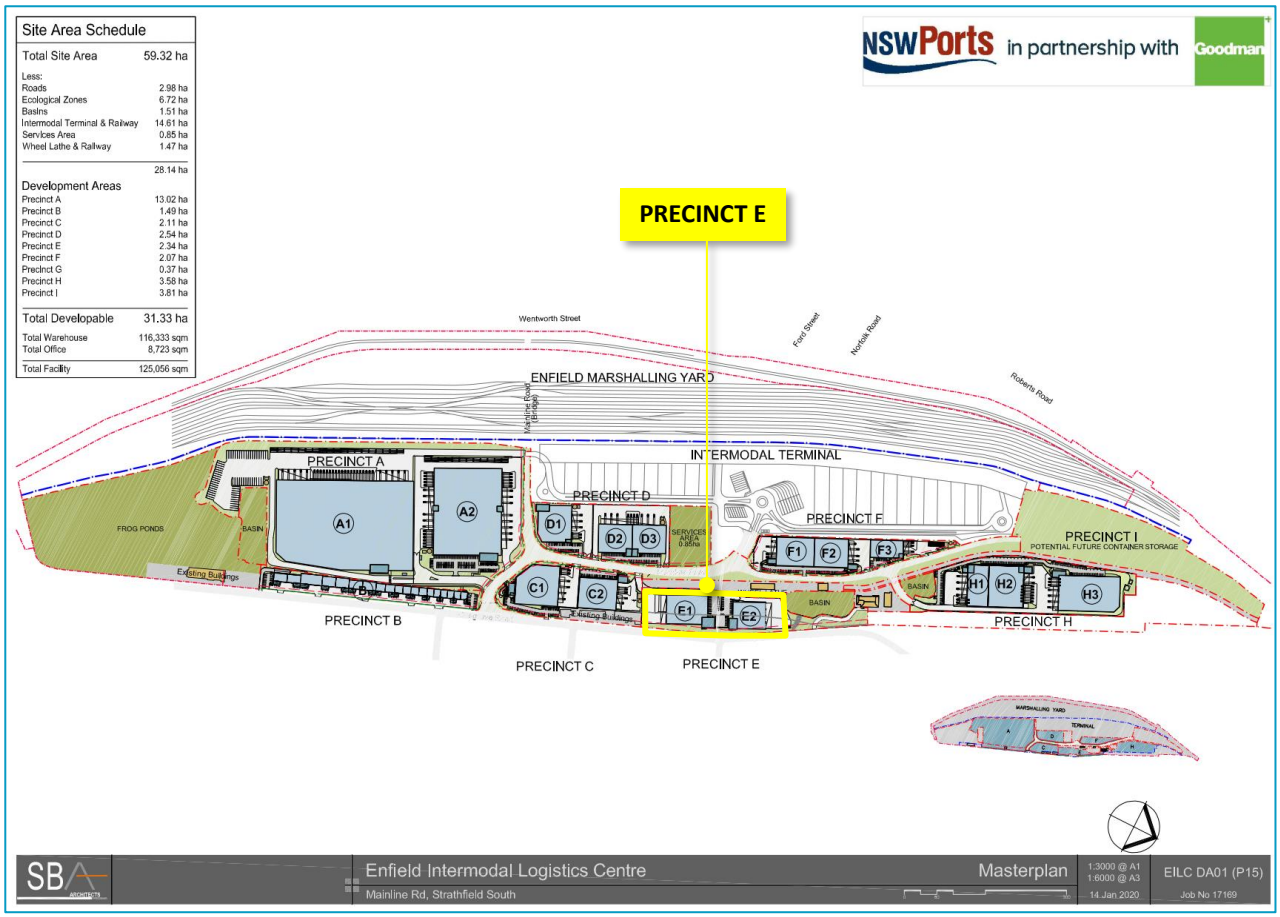


Figure 2 Detailed Site Plan – Enfield Intermodal Logistics Centre



Source: SBA Architects, Enfield Intermodal Logistics Centre – Masterplan; EILC DA01 (P15), 14 January 2020.

2.2 Construction Methodology

A summary of the anticipated construction activities is shown in **Table 2**. The total time estimated for the construction of Precinct E is approximately 10 months.

Table 2 Summary of the Proposed Construction Activities and Timeframes

Activity	Timeframe
Head contract execution	Week 0
Construction certificate and site establishment works	Week 1-2
Bulk and detail earthworks	Week 2-12
Footings, retaining wall and backfill	Week 10-20
Structure	Week 20-26
Roofing, services and cladding	Week 23-33
Warehouse slabs and joint sealing	Week 31-37
Office weatherproofing, base building fit out and finishes	Week 34-42
Early Access	Week 40
External works, Commissioning, Practical Completion	Week 38-44

2.3 Construction Hours

Construction hours for the Project will be in accordance with Conditions 2.15 and 2.16 of Development Consent MP 05_0147, which are reproduced below:

> ***2.15*** *The Proponent shall only undertake site preparation and construction activities associated with the project that would generate an audible noise at any residential premises during the following hours:*
>
> *a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;*
>
> *b) 8:00 am to 1:00 pm on Saturdays; and*
>
> *c) At no time on Sundays or public holidays.*
>
> *This condition does not apply in the event of a direction from police or other relevant authority for safety reasons.*
>
> ***2.16*** *The hours of site preparation and construction activities specified under Condition 2.15 of this approval may be varied with the prior written approval of the Director-General. Any request to alter the hours of construction specified under Condition 2.15 shall be:*
>
> *a) Considered on a case-by-case basis;*
>
> *b) Accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and*
>
> *c) Accompanied by sufficient information for the Director-General to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site.*

3 Potential Sources and Impacts of Dust Emissions

3.1 Potential Sources of Dust Emissions

Potential sources of dust emissions associated with the construction of Precinct E have been identified as follows:

- 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 conditions due to road closures or diversions.

Given the nature of historical uses of the Enfield ILC area, there is also the potential for earthworks activities to excavate into soils containing contaminants of potential concern (i.e. odorous and/or toxic contaminants). These contaminants could be emitted into the air during soil disturbance. A HAZMAT investigation will be carried out prior to any construction activities and if substantial contamination is identified, this CDMP will be updated to address the findings of the HAZMAT investigation.

In addition to the construction activities being carried out at any point in time, a number of other environmental factors will also affect dust emissions from the Project, including:

- Wind direction - determines whether dust and suspended particles are transported in the direction of the sensitive receivers;
- Wind speed - governs the potential suspension and drift resistance of particles;
- 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 and reduces the risk of dust generation.

3.2 Potential Impacts of Dust Emissions

3.2.1 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 term “particulate matter” refers to a category of airborne particles, typically less than 30 microns (µm) in diameter and ranging down to 0.1 µm and is termed total suspended particulate (TSP).

Emissions of particulate matter less than 10 and 2.5 microns (µm) in diameter (referred to as PM_{10} and $PM_{2.5}$ respectively) are considered important pollutants due to their ability to penetrate into the respiratory system. In the case of the $PM_{2.5}$ category, recent health research has shown that this penetration can occur deep into the lungs. Potential adverse health impacts associated with exposure to PM_{10} and $PM_{2.5}$ include increased mortality from cardiovascular and respiratory diseases, chronic obstructive pulmonary disease and heart disease, and reduced lung capacity in asthmatic children.

3.2.2 Deposited Particulate Matter

Section 3.2.1 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.

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.

4 Regulatory Framework

This section details the regulatory framework applicable to the construction of Enfield ILC. The applicability of the monitoring requirements for the construction of Precinct E is assessed separately in **Section 8**.

4.1 Development Consent Conditions Relevant to Air Quality

Condition 2.20 of the Development Consent MP 05_0147 states that:

> *"The Proponent shall install, operate and maintain a meteorological monitoring station to monitor weather conditions representative of those on the site, in accordance with:*
>
> *a) AM-1 Guide to Siting of Sampling Units (AS 2922-1987);*
>
> *b) AM-2 Guide for Horizontal Measurement of Wind for Air Quality Applications (AS 2923- 1987); and*
>
> *c) AM-4 On-Site Meteorological Monitoring Program Guidance for Regulatory Modelling Applications.*
>
> *The Proponent shall install the meteorological monitoring station prior to the commencement of site preparation or construction works and shall use the station to undertake the monitoring required under condition 3.1 of this approval, until all large exposed areas have either been landscaped or sealed.*
>
> *This condition does not preclude the Proponent from reaching agreement with any other relevant party for the installation, operation and maintenance of a shared monitoring station, provided the outcomes of this condition are achieved.*
>
> *During periods of repair or maintenance of the meteorological monitoring station, the Proponent may utilise weather data collected at the Canterbury Racecourse Automatic Weather Station, operated by the Bureau of Meteorology, or other nearby Bureau of Meteorology Stations in the event that the Canterbury station is offline."*

Condition 3.1 of the Development Consent MP 05_0147 states that:

> *"From the commencement of site preparation and construction works associated with the project, the Proponent shall continuously monitor, utilising the meteorological monitoring station referred to under condition 2.20 of this approval, each of the parameters listed in Table 4, utilising the sampling method indicated and applying a 15-minute average period to all results, and recording data in units specified in the Table.*
>
> *During periods of repair or maintenance of the meteorological monitoring station, the Proponent may utilise weather data collected at the Canterbury Racecourse Automatic Weather Station, operated by the Bureau of Meteorology, or other nearby Bureau of Meteorology Stations in the event that the Canterbury station is offline. "*

Parameter	Units of Measure	Sampling Method*	Method
Temperature at two metres	°C	AM-4	USEPA (2000) EPA 454/ R-99-005
Temperature at ten metres	°C	AM-4	USEPA (2000) EPA 454/ R-99-005
Wind speed at ten metres	ms-1	AM-2 and AM-4	AS 2923-1987; USEPA (2000) EPA 454/R-99-005
Wind direction at ten metres	°	AM-2 and AM-4	AS 2923-1987; USEPA (2000) EPA 454/R-99-005
Solar radiation	Wm-2	AM-4	USEPA (2000) EPA 454/ R-99-005

*refer Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA, 2005)

Condition 3.2 of the Development Consent MP 05_0147 states that:

> *"The Proponent shall, from the commencement of soil disturbing works on the site until all large exposed areas have either been landscaped or sealed, continuously monitor ambient dust concentrations (PM_{10}) at two of the most-affected residential receptor(s) to the site (with monitoring undertaken either on the boundary of the site or within the affected residential areas) employing the sampling and analysis methods specified under AM-18 or AS3580.9.8 or as otherwise agreed by the Director-General.*
>
> *Results of dust monitoring shall be recorded in μ/gm^3 and shall be utilised for the purpose of site preparation and construction dust management under condition 6.3(e) of this approval."*

4.2 Approved Methods for the Sampling and Analysis of Air Pollutants in NSW

The *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (DEC 2006) (hereafter the 'Approved Methods for Sampling') lists the methods to be used for sampling and analysis of air pollutants in NSW for statutory purposes.

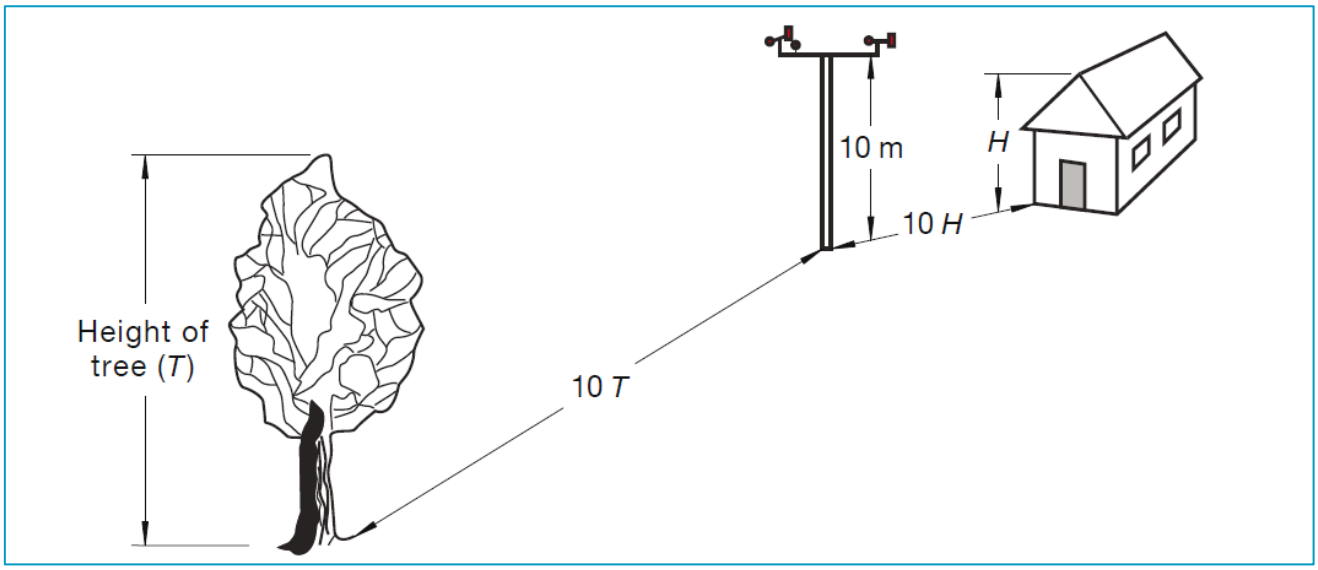
As noted in **Section 4.1**, Condition 2.2 of Development Consent MP 05_0147 references the following methods for meteorological monitoring listed in the Approved Methods for Sampling:

- AM-1 *Guide to Siting of Sampling Units* (AS 2922-1987, superseded by AS 3580.1.1.2016).
- AM-2 *Guide for Horizontal Measurement of Wind for Air Quality Applications* (AS 2923- 1987, superseded by AS 3580.14.2014).
- AM-4 *On-Site Meteorological Monitoring Program Guidance for Regulatory Modelling Applications* (USEPA (2000) EPA 454/R-99-005).

A summary of the siting requirements outlined in AM-1 for wind instruments is shown in **Figure 3**.

A summary of the recommended instrument performance specifications for wind speed, wind direction, temperature and solar radiation systems outlined in AM-2 and AM-4 are shown in **Table 3** and **Table 4**.

Figure 3 Summary of Siting Requirements for Wind Instruments



Source: AS 3580.1.1.2016

Table 3 Recommended Instrument Performance Specifications for Wind Speed and Wind Direction

Parameter	Wind Speed	Wind Direction	Temperature
Range	0.5 to 30 m/s	0 to 360°	-10°C to 50°C
Total Accuracy	3% or ±0.2 m/s	±3°	±0.3°C
Maximum averaging interval	10 min	10 min	NA
Data sampling interval	5 sec	>60 scalar/vector means >360 for sigma theta	NA

Source: AS 3580.14.2014

Table 4 Recommended Instrument Performance Specifications for Solar Radiation

Parameter	Solar Radiation (First Class)
Response time	<30 sec
Directional response	±20 W/m^2
Temperature response	±4%

Source: AS 3580.14.2014

The methods listed for the monitoring of ambient particulate levels in the Approved Methods for Sampling are:

- AM-14 - AS 2724.2-1987 *Determination of suspended matter expressed as equivalent black smoke by filter paper soiling* (since withdrawn by Standards Australia);
- AM-15 - AS 2724.3-1984 *Total suspended particulate matter (TSP) - High volume sampler gravimetric method* (superseded by 3580.9.3-2015);
- AM-16 - AS 2724.4-1987 *Particulate matter – Determination of light-scattering – Integrating nephelometer method* (superseded by 3580.12.1-2015);

- AM-17 - AS 2724.5-1987 *Particulate matter – Determination of impinged matter – Directional dust gauge method* (superseded by 3580.10.2-2013);
- AM-18 - AS 3580.9.6-1990 *Particulate matter – Determination of PM_{10} – High-volume sampler (HVS) with size-selective inlet* (superseded by 3580.9.6-2015);
- AM-19 - AS 3580.10.1-1991 *Particulates – Deposited matter – gravimetric method* (superseded by 3580.10.1-2016); and
- AM-22 - AS 3580.9.8-2001 *Determination of suspended particulate matter – PM_{10} continuous direct mass method using a tapered element oscillating microbalance (TEOM) analyser* (superseded by 3580.10.1-2008).

As reproduced in **Section 4.1**, Condition 3.2 of Development Consent MP 05_0147 references methods AM-18 or AS3580.9.8 (ie AM-22) for the PM_{10} monitoring to be performed during the Project. However it also notes that another method may be used with agreement from the Director-General. A summary of the recommended sampling inlet positioning criteria for PM_{10} monitoring equipment listed in AM-1 is shown in **Table 5**. As the PM_{10} monitoring stations are required by Condition 3.2 of Development Consent MP 05_0147 to be located at the nearest sensitive receptors, the criteria for an off-site neighbourhood station are considered to be the most relevant.

Table 5 Recommended Sampling Inlet Positioning Criteria

Pollutant	Type of Monitoring Station	Height above Ground to Probe	Other Locating Criteria (minimum requirements)	Relevant Australia Standard	Sampling Method
PM_{10}	Neighbourhood and background	1.5 m to 15 m	- Clear sky angle 120° - Unrestricted airflow of 270° around sample inlet - 10 m from any object with a height exceeding 2 m below the height of the sample inlet - No extraneous sources nearby - 50 m from road	AS 3580.9.6 AS 3580.9.8 AS 3580.9.9 * AS 3580.9.11 *	AM-18 (HVS) AM-22 (TEOM) Low Volume Sampler (LVS) Beta attenuation monitor (EBAM)
	Peak	1.5 m to 15 m	- Unrestricted airflow of 180° around sample inlet with no obstruction between the major source and the sample inlet - No extraneous sources nearby - 2 m from road - 10 m from any object with a height exceeding 2 m below the height of the sample inlet - Col-located high volume samplers 2-4 m apart - No trees between sampling inlet and source	AS 3580.9.6 AS 3580.9.8 AS 3580.9.9 * AS 3580.9.11 *	AM-18 (HVS) AM-22 (TEOM) Low Volume Sampler (LVS) Beta attenuation monitor (EBAM)

* Published after the Approved Methods for Sampling was last updated.

In addition to the recommended siting criteria set out in the standards listed above, siting of the meteorological and PM_{10} monitoring equipment will need to consider land access approvals, as well as power and site security requirements. As part of installing the meteorological and PM_{10} monitoring equipment, a full siting review is to be performed to assess compliance with 3580.1.1.2016 (ie AM-1), within the limitations of any site restrictions. A suitability qualified consultant must be commissioned for the installation and maintenance of the meteorological station and air quality monitors.

4.3 Ambient Air Quality Criteria

4.3.1 National Environment Protection Measure for Ambient Air Quality

Since the Development Consent MP 05_0147 was granted on 5 September 2007, the National Clean Air Agreement (NCAA) was endorsed by Commonwealth, state and territory Environment Ministers on 15 December 2015. Ministers agreed to strengthen national ambient air quality reporting standards for airborne fine particles. All jurisdictions have agreed to implement strengthened standards for particles, as well as move to even tighter standards for annual average and 24-hour $PM_{2.5}$ in 2025.

As such, in February 2016, a variation to the National Environment Protection Measure (NEPM) for Ambient Air Quality was made to extend its coverage to $PM_{2.5}$, setting reporting standards for $PM_{2.5}$ with no allowable exceedances (NEPC 2016). In addition, the NEPM (Ambient Air Quality) standard for annual average PM_{10} was revised to be in line with the NCAA.

The ambient air quality standards adopted by current NEPM (Ambient Air Quality) for fine particulate matter are shown in **Table 6**. It is noted that the 24-hour standard for PM_{10} conforms to Condition 6.3 (e) of the Development Consent MP 05_0147.

Table 6 National Environment Protection Measure for Ambient Air Quality – Particulate Standards

Pollutant	Averaging Period	Standard (µg/m^3)
PM_{10}	24 hours	50
	Annual	25
$PM_{2.5}$	24 hours	25
	Annual	8

4.3.2 Approved Methods for the Modelling and Assessment of Air Pollutants in NSW

The Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (Approved Methods for Modelling) published by the NSW EPA (NSW EPA, 2016), lists the statutory methods for modelling and assessing emissions of air pollutants from stationary sources in the state. It includes impact assessment criteria for TSP, PM_{10}, $PM_{2.5}$ and deposited dust. These criteria are listed in **Table 7**.

Table 7 NSW EPA Approved Methods for Modelling & Assessment of Air Pollutants – Assessment Criteria

Pollutant	Averaging Period	Assessment Criteria ($\mu g/m^3$)
PM_{10}	24 hours	50
	Annual	25
$PM_{2.5}$	24 hours	25
	Annual	8
TSP	Annual	90
		Assessment Criteria (g/m^2/month)
Deposited dust	Annual	2 (maximum increase in deposited dust level) 4 (maximum total deposited dust level)

4.4 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.

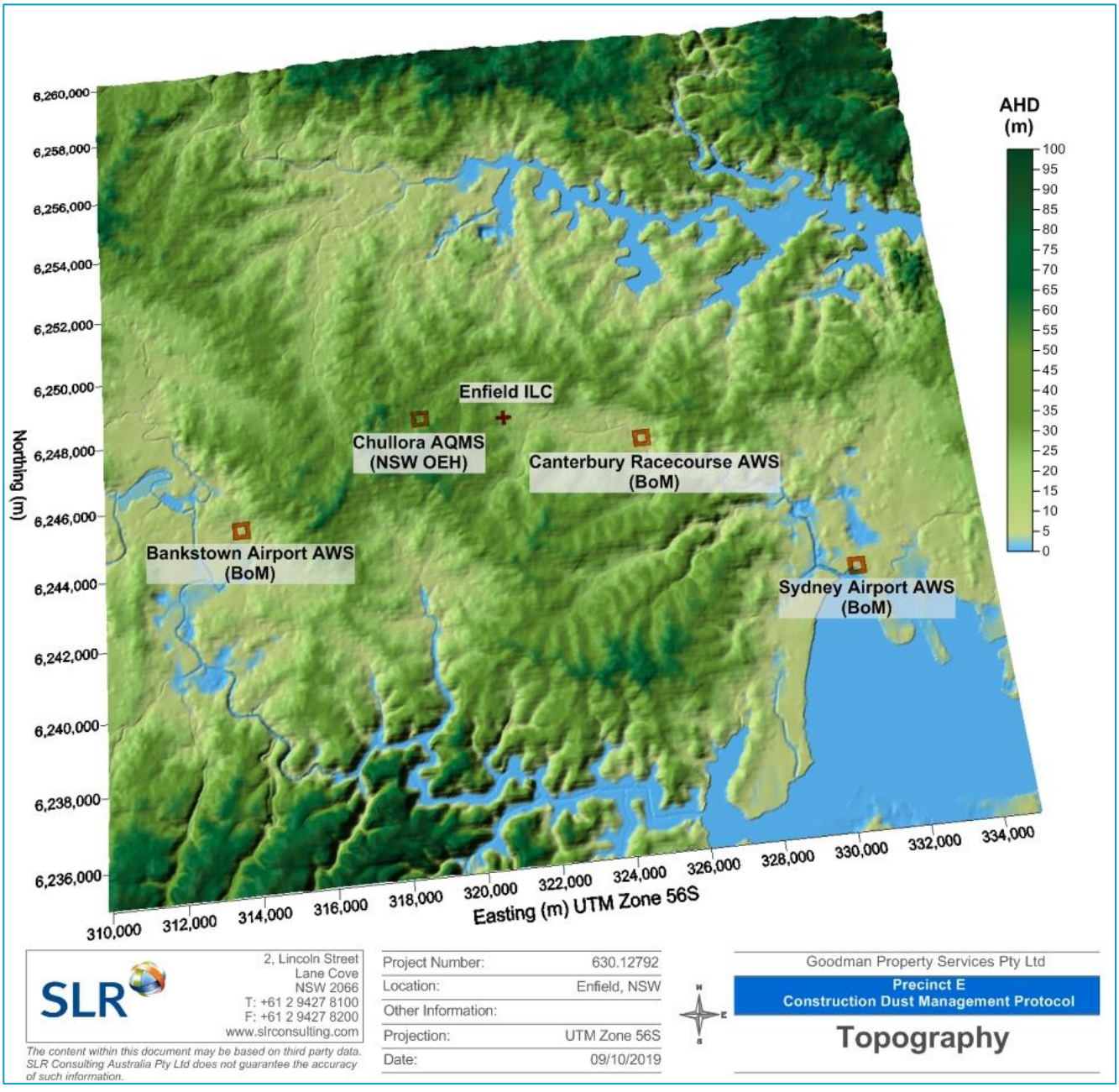
This document lists the common sources of emissions and mitigation and management measures to control airborne dust levels from construction sites, and has been consulted in the development of this CDMP.

5 Existing Environment

5.1 Regional Topography

Figure 4 illustrates the topography of the region surrounding the Enfield ILC. The ground elevation ranges from approximately 5 – 100 m within 500 m of the site.

Figure 4 Topography Surrounding the Enfield ILC



5.2 Local Meteorology

5.2.1 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 Automatic Weather Stations (AWS) and publishes data recorded at those stations across Australia. The closest such weather station is located at the Canterbury Racecourse approximately 3.5 km southeast of Enfield ILC (see **Figure 4**), and records wind speed and wind direction, among other parameters. Considering the relatively flat terrain between the Canterbury Racecourse AWS and Enfield ILC, it may be assumed that the wind conditions recorded at the Canterbury Racecourse AWS are a reasonable representation of the wind conditions experienced at the Enfield ILC.

Annual and seasonal wind roses for the years 2014 to 2018 compiled from data recorded by the Canterbury Racecourse AWS are presented in **Figure 5**. 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 following description of wind speeds references the Beaufort Wind Scale, as outlined in **Table 8**. Use of the Beaufort Wind Scale is consistent with terminology used by the BoM.

Table 8 Beaufort Wind Scale

Beaufort Scale	Description	Wind Speed (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 rose for the years 2014 to 2018 (**Figure 5**) indicate that the predominant wind directions experienced in the area are from the northwest and southeast directions. A very low frequency of winds from the south-southwest and southwest was recorded across all years. The annual frequency of calm wind conditions was recorded to be approximately 7%.

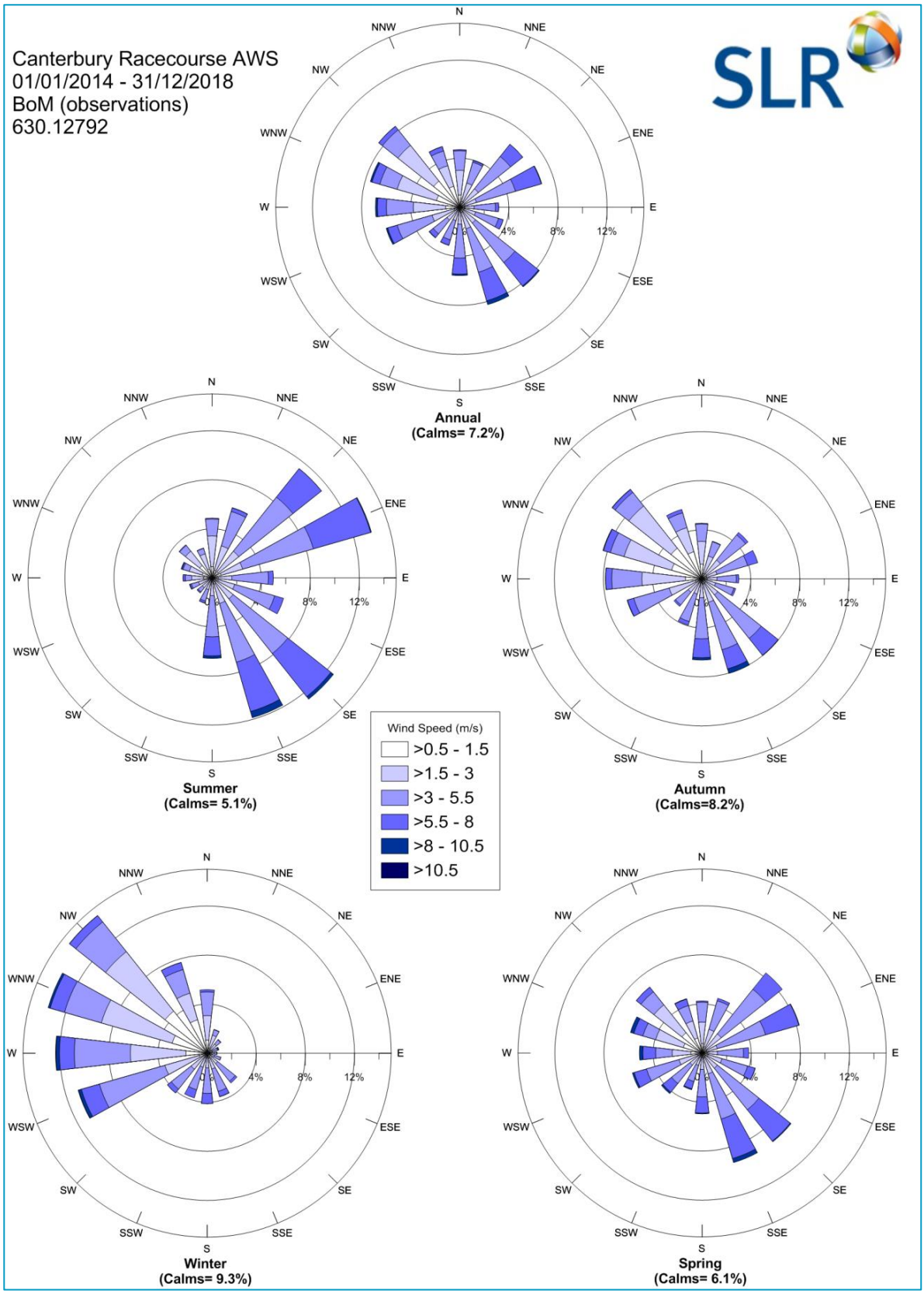
The seasonal wind roses for the years 2014 to 2018 indicate that:

- In summer, winds are predominantly from the northeast and southeast directions, with negligible winds from the western quadrant. Calms were recorded to occur approximately 5% of the time during the summer months.
- In autumn, winds are predominantly from the northwestern direction with few winds from the east and east-southeast. Calms were recorded for approximately 8% of the time during the autumn months.
- In winter, winds are predominantly from between the northwest and west directions with very few winds from between the northeast and east directions. Calms were recorded for approximately 9% of the time during the winter months.
- In spring, there are winds from all directions, with the highest frequency recorded as being from the southeast and south-southeast directions. Calms were recorded for approximately 6% of the time during the spring months.

From the long term wind patterns recorded by the Canterbury Racecourse AWS, and assuming that the same wind conditions will be experienced at the Enfield ILC, it can be concluded that that the Enfield ILC is likely to be subjected to winds from all directions, with the lowest frequency of winds from the east and southwest directions.

The wind patterns suggest that dust emissions from the construction of Precinct E have the greatest potential to impact on receptors located southeast and northwest of the Enfield ILC.

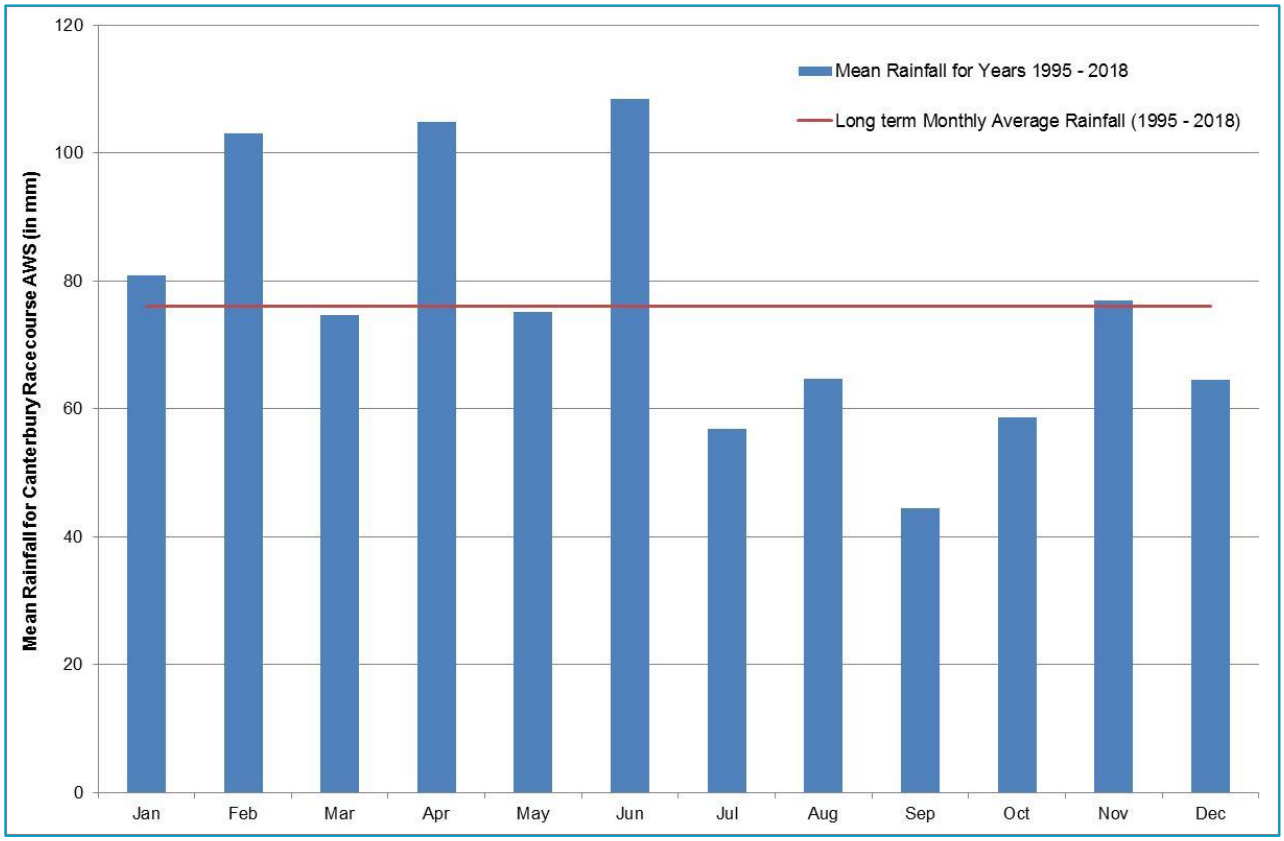
Figure 5 Annual Wind Roses for Canterbury Racecourse AWS (2014 to 2018)



5.2.2 Rainfall

Dry periods (no rainfall) have the greatest potential for fugitive dust emissions during construction. The long term monthly rainfall averages recorded by the Canterbury Racecourse AWS are shown in **Figure 6**, which show that generally rainfall is lower in the second half of the year. This rainfall pattern suggests that dust emissions from the construction of Precinct E have the greatest potential to impact on receptors during the months of July to October.

Figure 6 Long term Mean Rainfall for Canterbury Racecourse AWS – 1995 to 2018



5.3 Existing Air Quality

Air quality monitoring is performed by NSW OEH at a number of monitoring stations across NSW. The closest such station is the Chullora Air Quality Monitoring Station (AQMS), located approximately 2 km west of the Enfield ILC (see **Figure 4**).

The Chullora AQMS is located within a commercial/industrial area. Air quality measured at the Chullora AQMS is expected to provide a reasonable representation of the existing air quality experienced in close proximity to the Enfield ILC.

A summary of the ambient particulate concentrations measured by the Chullora AQMS over the last five years (2014-2018) is presented in **Table 9** and the data are presented graphically in **Figure 7** and **Figure 8**.

Table 9 Summary of Particulate Monitoring Data at Chullora AQMS (2014 – 2018)

Pollutant	PM_{10} (µg/m³)		$PM_{2.5}$ (µg/m³)	
	Maximum 24-Hour Average	Annual Average	Maximum 24-Hour Average	Annual Average
2014	40.0	18.1	23.1	9.0
2015	64.6	17.5	37.2	8.0
2016	63.5	18.1	49.4	8.0
2017	63.0	20.1	44.6	9.5
2018	90.7	21.9	29.1	8.6
Criterion	**50**	**25**	**25**	**8**

Figure 7 Measured 24-Hour Average PM_{10} Concentrations at Chullora AQMS (2014 – 2018)

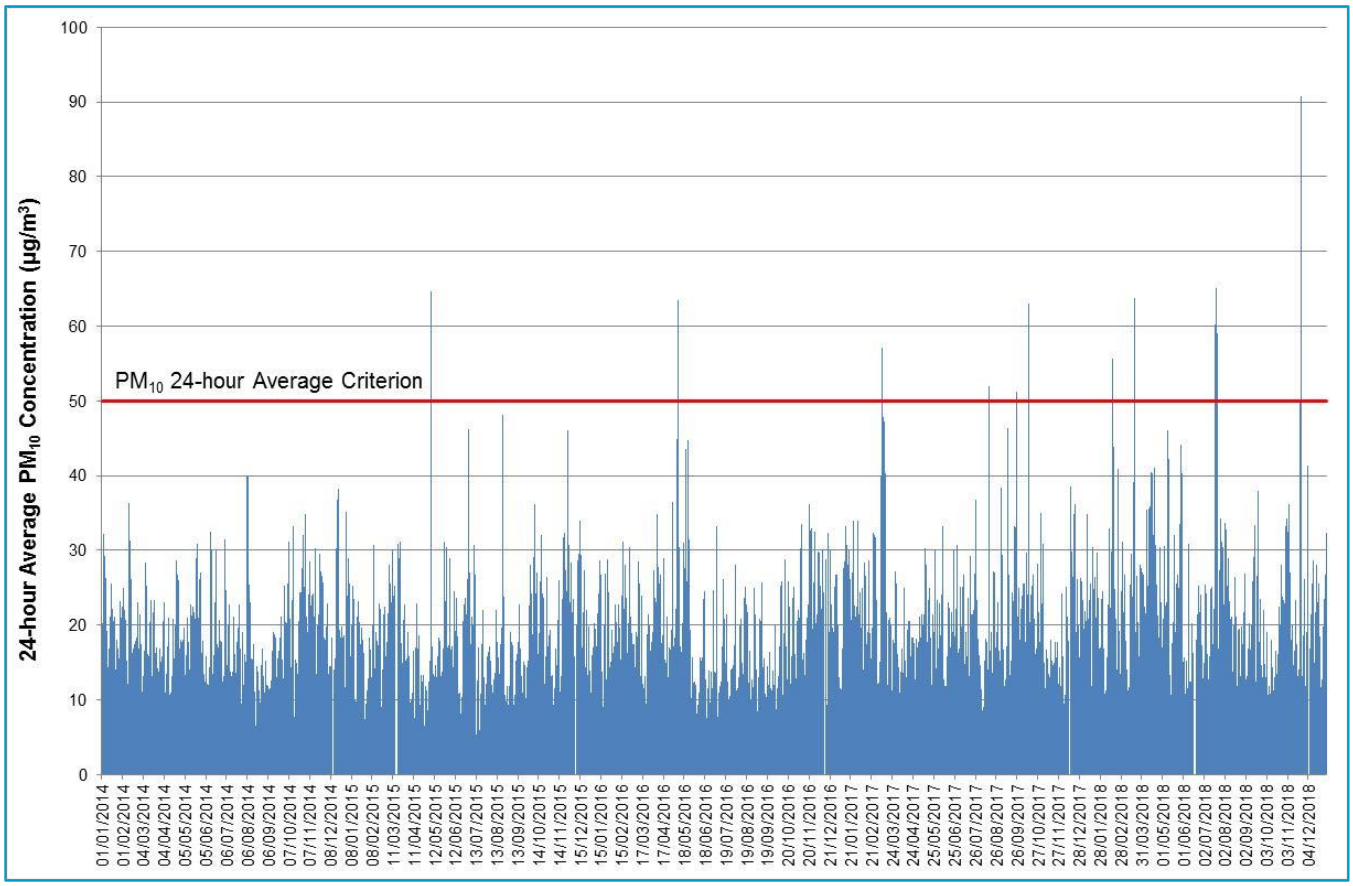
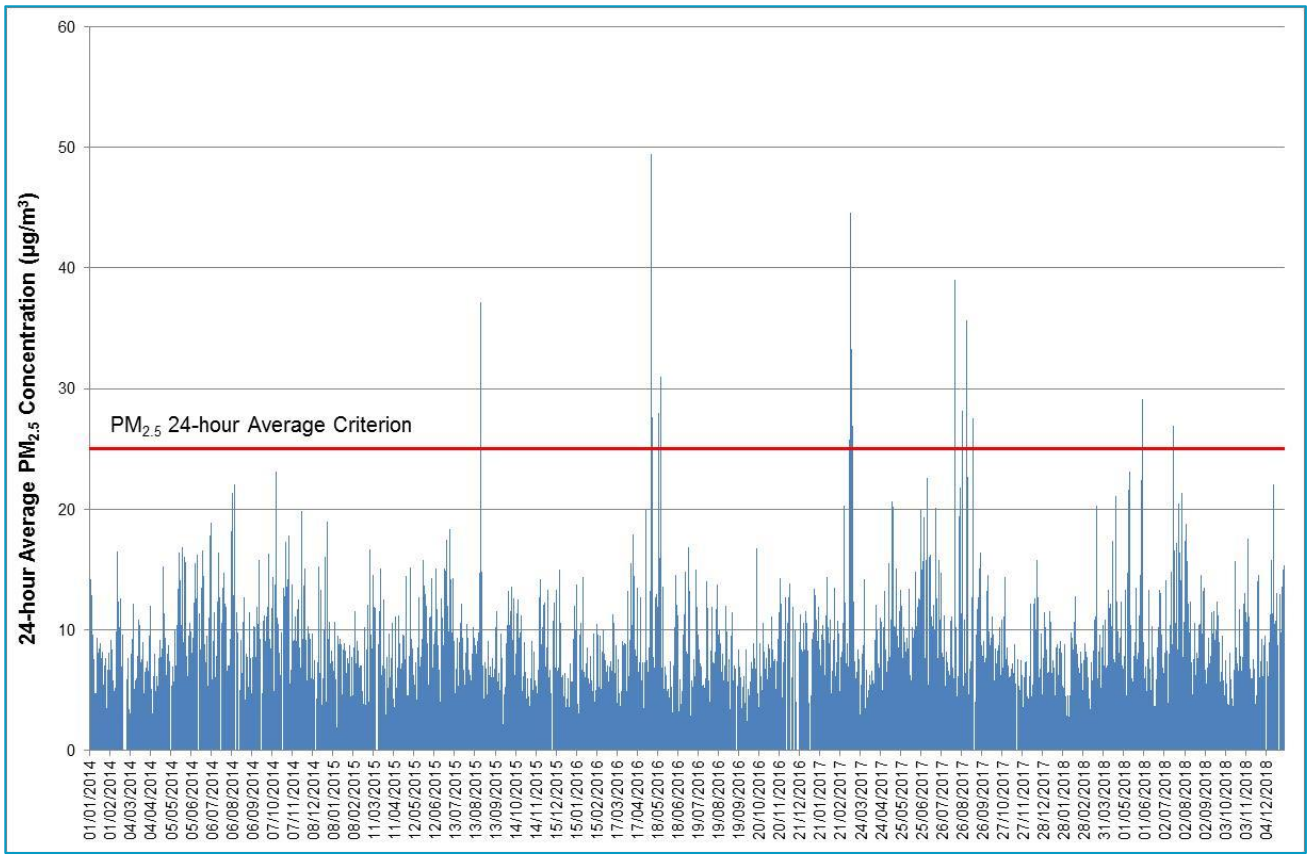


Figure 8 Measured 24-Hour Average $PM_{2.5}$ Concentrations at Chullora AQMS (2014 – 2018)



The particulate monitoring data from Chullora AQMS show that exceedances of the relevant short-term criteria (24-hour average) were recorded during 2015, 2016, 2017 and 2018 for both PM_{10} and $PM_{2.5}$. A summary of these exceedances is shown in **Table 10**.

At the time of writing this report, the annual compliance report for 2018 is not available. For all other years (2014-2017), a review of available information regarding the measured exceedances of the PM_{10} and $PM_{2.5}$ criteria indicate that most exceedances were caused by exceptional regional events such as bushfire emergencies or dust storms.

Particulate monitoring data from the nearest representative AQMS therefore indicates that during the construction of Precinct E, there is potential for elevated background levels of PM_{10} to occur and that focus should be on the minimisation and mitigation of particulate emissions from the Project to minimise the potential for contributing to cumulative impacts. In addition, if exceedances are recorded by PM_{10} monitoring stations installed at the nearest residences, then an investigation into the likely contribution from background sources needs to be performed (eg based on a review of data from regional monitoring stations for the relevant period) to assess whether or not these exceedances were likely to occur even without any contribution from the Project.

Table 10 Summary of Exceedances of the Criteria for Fine Particles (PM_{10} and $PM_{2.5}$)

Date of Exceedance	Value (µg/m^3)	Comments	Source
Maximum 24-hour Average PM_{10}			
06/05/2015	64.6	Result of a state-wide dust storm that originated from the Victorian Mallee and Southern NSW regions and travelled throughout NSW during the 5 & 6 May (NSW Air Quality Statement, 2015).	OEH 2017a
08/05/2016	63.5	Exceptional events*	OEH 2017b
08/03/2017	57.1	2 days above the standard due to non-exceptional events. 2 days above the standard due to exceptional events*.	OEH 2018
14/08/2017	51.9		
24/09/2017	51.3		
12/10/2017	63.0		
Maximum 24-hour Average $PM_{2.5}$			
21/08/2015	37.2	Result of smoke from a number of hazard reduction burns.	OEH 2017a
07/05/2016	31.3	Exceptional events*	OEH 2017b
08/05/2016	49.4		
09/05/2016	27.6		
19/05/2016	28.0		
22/05/2016	31.0		
07/03/2017	25.8	4 days above the standard due to non-exceptional events. 4 days above the standard due to exceptional events".	OEH 2018
08/03/2017	44.6		
09/03/2017	33.3		
12/03/2017	26.9		
14/08/2017	39.0		
27/08/2017	28.2		
02/09/2017	35.7		
12/09/2017	27.5		

Note: *Exceptional events are those related to bushfires, hazard reduction burns and dust storms. These are not counted towards the NEPM goal of 'no days above the particle standards in a year'.

6 Mitigation Measures

The potential for dust emissions during construction works at Precinct E and the predicted impact (as discussed in **Section 1.1**) 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 dust mitigation measures to be implemented during the construction works are detailed in **Table 11**.

Table 11 Proactive Dust Mitigation Measures

#	Mitigation Measure
1	**Communications**
1.1	Develop and implement a stakeholder communications plan that includes community engagement (via the NSW Ports CLC meetings) 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 will be the relevant person/office at NSW Ports.
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.
2.2	Make the complaints log available to the Local Authority when requested.
2.3	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
3	**Monitoring**
3.1	Carry out weekly site inspections to monitor compliance with this CDMP, record inspection results, and make an inspection log available to the Local Authority when requested.
3.2	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.
4	**Preparing and Maintaining the Site**
4.1	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
4.2	Erect solid screens or barriers around dusty activities or the site boundary that they are at least as high as any stockpiles on site.
4.3	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
4.4	Avoid site runoff of water or mud.
4.5	Keep site fencing, barriers and scaffolding clean using wet methods.
4.6	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.
4.7	Cover, seed or fence stockpiles to prevent wind erosion.
5	**Operating Vehicle/Machinery and Sustainable Travel**
5.1	Ensure all on-road vehicles comply with relevant vehicle emission standards, where applicable.
5.2	Stationary trucks will switch off engines if idling time on-site is likely to exceed 2 minutes.

#	Mitigation Measure
5.3	Avoid using the local road network during peak traffic periods, where possible.
5.4	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
5.5	Minimise truck queuing and unnecessary trips through logistical planning.
6	**Operations**
6.1	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
6.2	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate.
6.3	Use enclosed chutes and conveyors and covered skips.
6.4	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.
7	**Waste Management**
7.1	No on-site burning of waste materials.
8	**Excavation**
8.1	Only the minimum area necessary is disturbed at any one time.
8.2	Where applicable, rehabilitation of disturbed areas will be undertaken as soon as practicable.
8.2	If unanticipated strong odours are encountered or significant dust emissions are noted on site, stop related work and seek advice from the Environmental Coordinator or equivalent role.
8.3	Carry out excavation works and vehicle loading/unloading when weather conditions are favourable (i.e. receptors are upwind from the works).
9	**Construction**
9.1	Avoid scabbling (roughening of concrete surfaces) if possible.
9.2	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.
10	**Trackout**
10.1	Use water-assisted dust sweeper(s) on the access and local roads to remove, as necessary, any material tracked out of the site.
10.2	Avoid dry sweeping of large areas.
10.3	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
10.4	Record all inspections of haul routes and any subsequent action in a site log book.
10.5	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site).
11	**Contingency Plan for Prolonged Dust Events**
11.1	Deployment of additional water sprays where practicable
11.2	Relocation or modification of dust-generating sources, where possible
11.3	Temporary halting of activities and resuming when conditions have improved

As outlined in the mitigation measures proposed in **Table 11**, daily site inspections will be carried out during construction works (see **Section 8**). 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.
- Inspection of stockpiles and waste storage areas to ensure no significant wind erosion is observable.

Any environmental inspection reports will include the above observations, with remedial or corrective actions noted (as appropriate). Any remedial or corrective actions must be reported to the Site Manager as soon as is practicable.

7 Complaints Handling and Response Procedure

A complaints log will be maintained and kept on site with the following details noted at minimum for all dust-related complaints:

- The date/time of the complaint;
- The location that the impacts were observed to be occurring;
- The contact details of the complainant (if they agree to provide details);
- Nature of the complaint (ie nuisance, health-related impacts);
- Perceived or assumed source of the conditions giving rise to the complaint, including perceived duration and frequency;
- On-site activities being undertaken at the time of the complaint;
- Weather conditions (ie wind, recent rainfall, temperature) experienced on the day of the complaint;
- Name of staff on duty; and
- Action taken by the premises to investigate/resolve the complaint.

Where a dust complaint is made, an investigation into the possible source(s) of the dust will be made and (where on-site sources are identified) remedial control measures will be implemented to reduce emissions to a level that does not cause a continuation of unacceptable impacts.

All complaints relating to environmental matters (ie air quality) and/or construction activities shall be reported to the Site Manager and Project Manager. The Site Manager will report back to the Project Manager on potential causes of the complaint and any action taken. The Project Manager is also responsible for providing feedback to the complainant within 48 hours on the outcomes of the investigation and any actions taken.

8 Air Quality Monitoring Program

Given the nature, scale and duration (ie approximately 10 months) of the proposed construction works, it is not anticipated that any significant impacts upon human health or amenity values would be experienced. The Enfield ILC AQIA concluded that there is a *low* risk for construction dust emissions to cause nuisance impacts at off-site sensitive receptor locations. Further, it concluded that these impacts will be temporary in nature and generally can be managed through the implementation of appropriate mitigation measures.

Condition 3.2 of the Development Consent MP 05_0147 prescribes the installation of two (2) continuous air quality monitors at "*two of the most-affected residential receptors*". Considering the low risk from the construction dust emissions to cause nuisance impacts at off-site sensitive receptor locations, it is considered that on-site monitoring (ie monitoring at source) would be more relevant for this Project. Therefore, monitoring will be conducted at two appropriate on-site locations to provide real-time data on dust levels close to the works, which will enable site management to assess the effectiveness of the dust controls being implemented and the need for any additional dust mitigation measures.

Further, Condition 3.2 prescribes the use of sampling methods AM-18 and AS3580.9.8 of the Approved Methods for Sampling. The use of these methods is considered unsuitable for this Project, as discussed below:

- AM-18 (high volume air sampler with size selective inlet) provides data on a 1-in-6 days basis and requires a technician to change the filter between each sampling event. As this method does not provide continuous monitoring data that can be used to assess likely sources (eg based on a wind direction analysis), there is significant delay between the sampling event and the receipt of the laboratory results, and given the significant labour requirements involved, the use of this method is not considered suitable for managing dust emissions during the Project.
- AS3580.9.8 (Tapered element oscillating microbalance [TEOM]) provides data on a continuous basis, however a TEOM requires a large secure space (3 m x 3 m); a reliable electricity connection and is very expensive. Given the *low* risk of off-site impacts and the siting requirements, this method is not proposed.

An alternative method for PM_{10} sampling has therefore been adopted, specifically AS/NZS 3580.9.11:2016 - *Determination of suspended particulate matter - PM_{10} beta attenuation monitors (BAM)*. This method offers continuous data, option to be setup on solar powered batteries, requires a much smaller area compared to a TEOM and is considerably less expensive. A comparison of these methods is shown in **Table 12**.

Table 12 Comparison of PM_{10} Monitoring Systems Commonly Used in Australia

Monitor	Advantages	Disadvantages	Indicative Costs
High Volume Air Sampler (HVAS)	Certified Reference Instrument. AS/NZ Standards available for PM_{10}, $PM_{2.5}$. Meets NEPM reporting requirements. Listed in QLD *Air Quality Sampling Manual.*	Requires mains power. Requires a stable concrete pad for siting. Requires a technician to manually change the filter paper between each sample. Increased labour costs. Much less data can be collected (eg 1 day in 6 sampling regime usually adopted) over the same time period compared to a continuous sampling method. Only 24 hour average concentrations are reported, so analysis against wind direction or time of day not able to be performed. Noise from pump can disturb residents.	$9,000 purchase $800/month rental + lab filter costs
TEOM (Tapered Element Oscillating Microbalance)	Certified Equivalent Instrument. AS/NZ Standards available for PM_{10}, $PM_{2.5}$. Meets NEPM reporting requirements. Listed in QLD *Air Quality Sampling Manual.* Continuous sampler so more data can be collected over the same time period compared to a HVAS or LVAS. Analysis of short-term concentrations against wind direction or time of day can be performed, eg to differentiate upwind/downwind measurements. Sample heated to 50°C so volatile mass lost; this can be mitigated by use of FDMS which increases price.	Very expensive Requires a large air-conditioned environmental enclosure to house the instrument. Requires mains power and must be hard-wired in by an electrician. Requires a stable concrete pad for siting. Requires a crane truck or forklift to assist with mounting the environmental enclosure into position. Cannot easily be relocated. Noise from air conditioner can disturb residents.	$67,000 purchase $5,800/month rental
EBAM-PLUS™ (Beta-Attenuation Monitor)	AS/NZ Standards available for PM_{10}, $PM_{2.5}$. Meets NEPM reporting requirements Can be operated from solar power if required (increased reliability if power provided). Portable unit so can easily be relocated to alternate monitoring positions. Continuous sampler so more data can be collected over the same time period compared to a HVAS or LVAS. Analysis of short-term concentrations against wind direction etc can be performed, eg to differentiate upwind/downwind results.	Not listed in QLD *Air Quality Sampling Manual.*	$33,000 purchase $3,070/month rental

Conditions 2.20 and 3.1 of the Development Consent MP 05_0147 prescribe the installation of an on-site meteorological station for the duration of construction works. It has been confirmed by Goodman that the construction contractor (i.e. Qanstruct) will undertake daily reviews of the meteorological data collected by the BoM station at Canterbury Racecourse AWS to manage site operations to minimise downwind dust impacts. Therefore, a requirement for an on-site monitoring station is not included in this CDMP.

Wind erosion of dust from exposed surfaces is usually initiated when actual 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). On this basis, if the wind data at Canterbury Racecourse AWS indicates that wind speeds greater than 5 m/s are being recorded, and visual inspections at the site indicate that dust is becoming airborne, then additional dust suppression (eg watering) is to be applied as appropriate.

Details of the recommended air quality monitoring program to assess compliance with Conditions 3.2 and 6.3 (e) of the Development Consent MP 05_0147 are provided in **Table 13**.

In the event that ongoing complaints from neighbouring residents are received that are shown to be associated with construction activities on the Project site, and have not been readily resolved through the implementation of additional dust controls as outlined in **Section 6**, monitoring of dust deposition levels using static dust gauges may also be conducted, which require replacing once a month. The installation and operation of the dust gauges will be performed by a suitable qualified consultant in accordance with AS 3580.10.1-2016. The location and number of dust gauges will also be reviewed before their installation and this CDMP updated to reflect any associated technical and reporting requirements.

Table 13 Air Quality Monitoring Program

Description	Parameter	Methodology	Duration	Location	Frequency
Qualitative Monitoring					
Daily visual inspections	On-site dust generation, vehicle exhaust emissions and compliance with mitigation measures	Visual inspection of dust-generating activities to: - 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 the CDMP. 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.	During site preparation, earthworks, construction and rehabilitation	On-site within Precinct E	Daily
Quantitative Monitoring					
Suspended particulate monitoring	PM_{10} as a 24-hour average in µg/m^3	AS/NZS 3580.1.1:2016 - Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment AS/NZS 3580.9.11:2016 - Determination of suspended particulate matter - PM_{10} beta attenuation monitors	During site preparation, earthworks, construction and rehabilitation	On-site within the Enfield ILC	Continuous
Meteorological Station	Wind speed (m/s) Wind direction (°)	Meteorological data recorded at Canterbury Racecourse AWS to be monitored and reviewed on a daily basis.	During site preparation, earthworks, construction and rehabilitation	Canterbury Racecourse	Twice daily

9 Roles and Responsibilities

The key responsibilities for dust management are as follows:

9.1 Project Manager

- Ensuring appropriate resources are available for the implementation of this CDMP;
- Responsible for providing assistance and advice to the Site Manager to fulfil the requirements of this Plan, assessing data from inspections and providing project-wide advice to ensure consistent approach and outcomes are achieved;
- Responsible for providing necessary training for project personnel to cover air quality management;
- Responsible for the review and update of this CDMP; and
- Responsible for commissioning a suitably qualified consultant to install and maintain the PM_{10} monitors, and any other dust monitoring systems identified as being required.

9.2 Site Manager

- 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 Canterbury Racecourse AWS) and onsite dust emissions;
- 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 Manager will conduct an investigation in accordance with the complaint handling procedure (see **Section 7**).

9.3 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.

10 Review of CDMP

This CDMP is part of a Construction Environmental Management Plan (CEMP) for the construction of Precinct E. This CDMP is a live document that will be reviewed as necessary to ensure that it remains relevant to construction activities and to determine whether improvements can be implemented. As a matter of course, the plan will be reviewed in the following circumstances:

- Following any significant air quality incident or impact;
- Where there is any change to the scope of the construction activities and/or disturbance footprint;
- Where there is change to the scope of monitoring requirement eg if additional monitoring is required following consistent complaints;
- If a HAZMAT investigation identifies that the construction activities will disturb any areas of substantial soil contamination;
- Where it is identified that the environmental performance of the Project is not meeting the objectives of the CDMP; and/or
- At the request of a relevant regulatory authority.

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APPENDIX E

Construction Noise and Vibration Management Plan

ENFIELD INTERMODAL LOGISTICS CENTRE

Precinct E
Construction Noise and Vibration Management Plan

Prepared for:

Goodman Limited
Level 17
60 Castlereagh Street
Sydney NSW 2000

SLR Ref: 630.12792-R02
Version No: -v1.1
January 2020

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BASIS OF REPORT

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 Goodman Limited (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
630.12792-R02-v1.1	9 January 2020	Joshua Ridgway	Antony Williams	Antony Williams
630.12792-R02-v1.0	16 October 2019	Joshua Ridgway	Antony Williams	Antony Williams

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Appendix A Acoustic Terminology

1 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Goodman Limited (Goodman) to prepare a Construction Noise and Vibration Management Plan (CNVMP) for construction works at the Enfield Intermodal Logistic Centre (ILC) Precinct E (the development), located west of Cosgrove Road and south of Liverpool Road in Strathfield South, NSW.

The CNVMP is designed to address the potential noise and vibration impacts associated with the construction of the development. Construction noise and vibration impacts were previously assessed for Precinct E as part of the *Enfield Intermodal Logistics Centre Noise and Vibration Impact Assessment (MOD14)* prepared by SLR in May 2018 (the NIA).

Specific acoustic terminology is used in this report. An explanation of common acoustic terms is provided in **Appendix A**.

2 Background

NSW Ports (the Proponent) in partnership with Goodman (the Developer), is currently constructing the Enfield ILC located in Strathfield South, NSW. The ILC is bound by Cosgrove Road to the east, Punchbowl Road to the south, Enfield Marshalling Yards to the west and Roberts Road to the north.

NSW Ports obtained Development Consent MP 05_0147 on 5 September 2007 from the Department of Planning and Environment (DPE) for the construction and operation of Enfield ILC with capacity to accept a maximum throughput of 300,000 TEU (one TEU is equivalent to one twenty foot container) per annum.

2.1 Site Overview and Layout

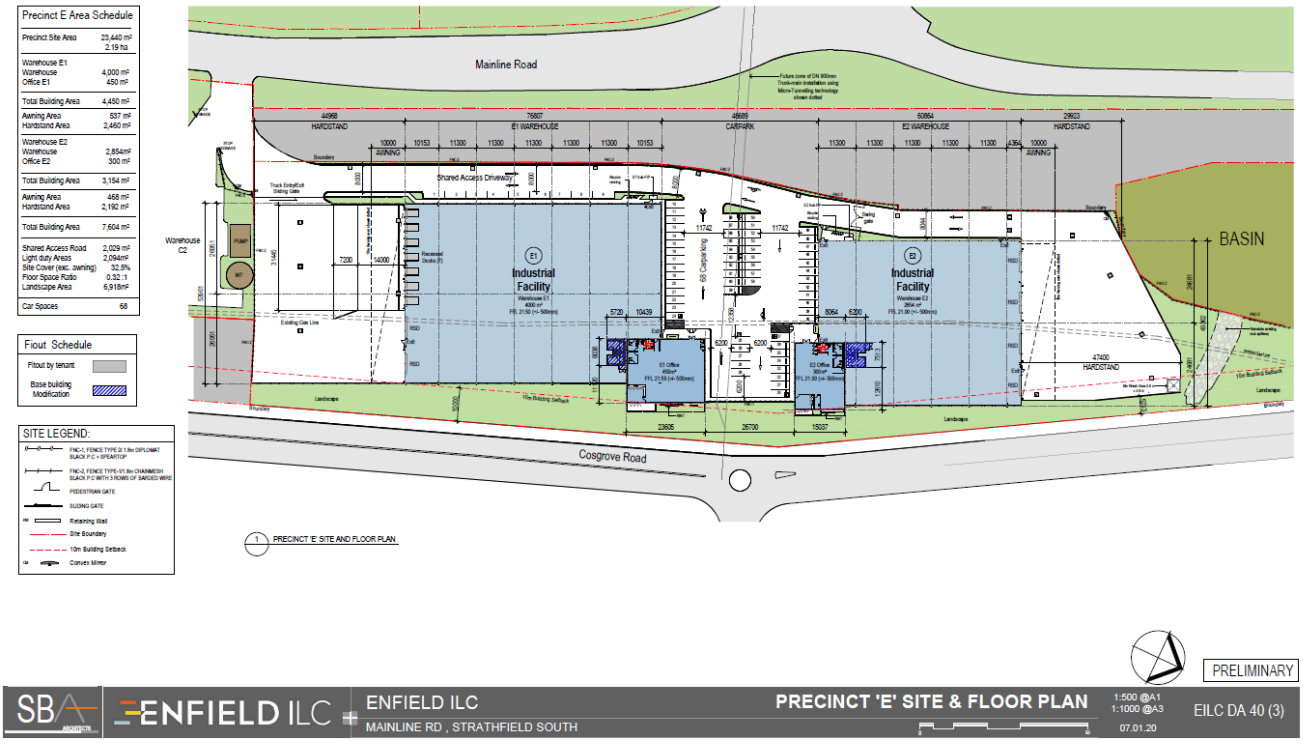
The ILC site is comprised of nine precincts (A to I).

This CNVMP applies to Precinct E which includes two warehouses, encompassing an area of 7,604 m^2. The proposed layout of Precinct E is presented in **Figure 1**.

The representative noise and vibration sensitive receivers identified in the NIA are presented in **Section 4**.

Figure 1 Precinct E Layout

NSWPorts in partnership with Goodman



3 Development Consent

3.1 Consent Conditions

This Construction Noise and Vibration Management Plan (CNVMP) has been prepared to accompany the Construction Environmental Management Plan (CEMP) for Precinct E. The conditions relevant to this CNVMP are outlined below in **Table 1**.

Table 1 Development Consent Conditions

Development Consent	Comments
Noise Impacts	
2.13 The proponent shall minimise noise emissions from plant and equipment operated on the site by installing and maintaining, wherever practicable, efficient silencers, low-noise mufflers (residential standard) and by replacing reversing alarms with alternative silent measures, such as flashing lights (subject to occupational health and safety requirements).	**Section 7 – Table 11**
Construction Noise	
2.15 The Proponent shall only undertake site preparation and construction activities associated with the project that would generate an audible noise at any residential premises during the following hours: a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive; b) 8:00 am to 1:00 pm on Saturdays; and c) at no time on Sundays or public holidays. This condition does not apply in the event of a direction from police or other relevant authority for safety reasons.	**Section 6.2**
2.16 The hours of site preparation and construction activities specified under condition 2.15 of this approval may be varied with the prior written approval of the Planning Secretary. Any request to alter the hours of construction specified under condition 2.15 shall be: a) considered on a case-by-case basis; b) accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and c) accompanied by sufficient information for the Planning Secretary to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site.	**Section 6.2**
Environmental Management	
6.3 As part of the Construction Environmental Management Plan for the project, required under condition 6.2 of this approval, the Proponent shall prepare and implement the following Management Plans: a) A **Construction Noise Management Plan** to outline construction noise mitigation, monitoring and management measures to be implemented to minimise noise impacts during construction of the project. The Plan shall include, but not necessarily be limited to:	**This document**
i) details of construction activities and a schedule for construction works;	**Sections 6.1 and 6.2**

Development Consent	Comments
ii) identification of construction activities that have the potential to generate noise and/or vibration impacts on surrounding land uses, particularly residential areas;	**Section 6.1**
iii) where the relevant construction noise goals contained in the *Noise Management Guideline – Construction Noise* (formerly published as Chapter 171 of the Environmental Noise Control Manual) are predicted to be exceeded at sensitive receivers, provision for the application of all practicable and reasonable noise mitigation measures to seek to achieve the relevant construction noise goals;	**Section 7**[1]
iv) procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity, as well as procedures for dealing with and responding to noise complaints; and	**Sections 7.1 and 8**
v) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, how the results of this monitoring would be recorded; and, if any non-compliance is detected.	**Section 11**

Note 1: The NSW *Interim Construction Noise Guideline* (ICNG), NSW EPA, 2009, has been used to determine appropriate construction noise goals as the ENCM is no longer a current guideline.

4 Noise and Vibration Sensitive Receivers

The noise and vibration assessment locations representative of the nearest sensitive receiver areas surrounding the ILC were identified in the NIA for the project and are shown in **Figure 2**.

The NIA identified sensitive receivers surrounding the entire ILC site, however, Precinct E occupies the central area of the ILC, as shown in **Figure 2**.

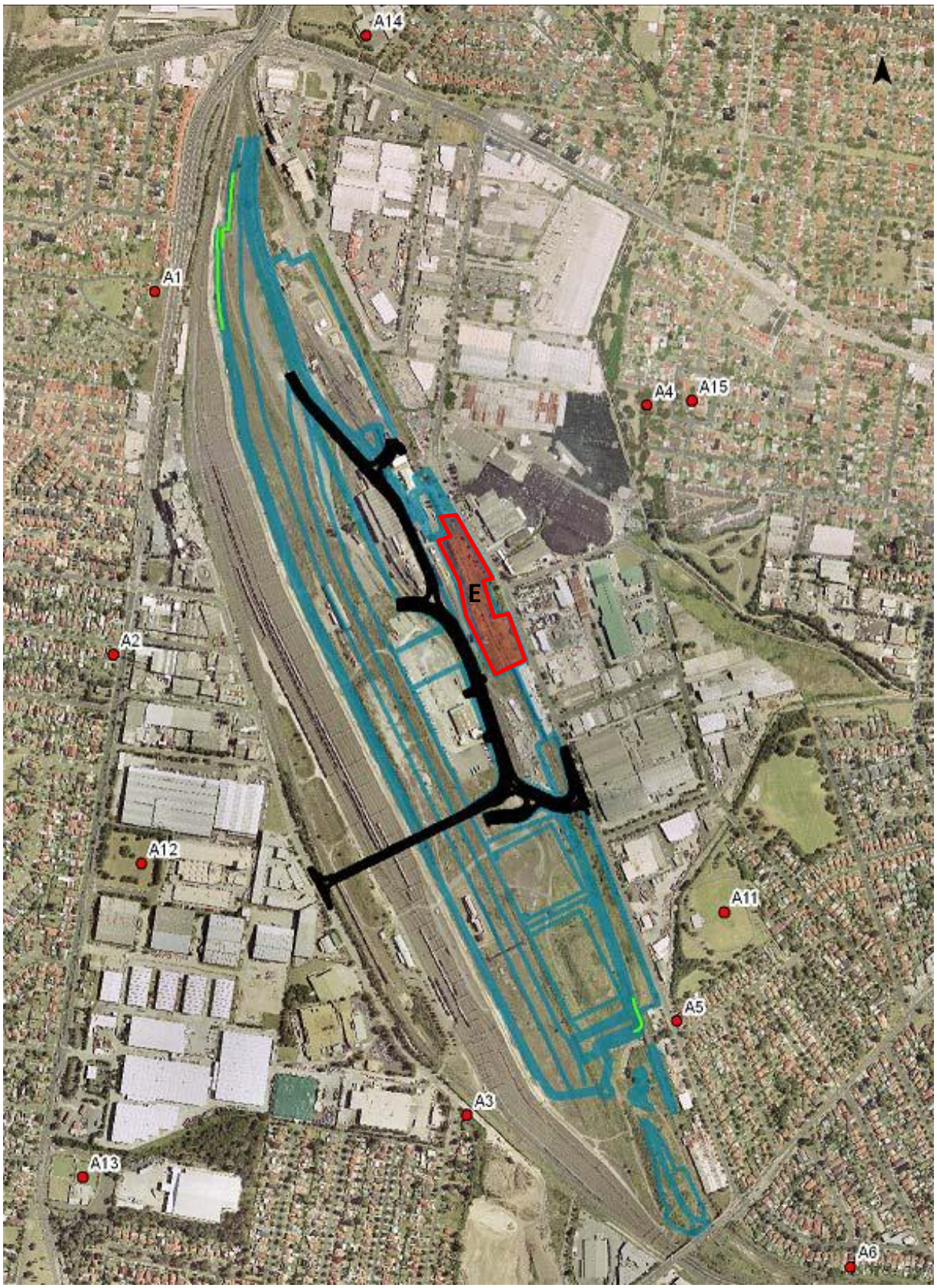
Receivers located to the south of the ILC site, which would be adjacent to construction activities at Precinct A, for example, will be less impacted by the construction activities at Precinct E due to the offset distance of the works to these receivers.

Details of the nearest potentially affected sensitive receivers are provided in **Table 2**.

Table 2 Surrounding Sensitive Receivers

ID	Address	Type	Distance (m)
A1	Eastern end of Jean Street	Residential	750 m northwest of Precinct E
A2	Eastern end of Ivy Street	Residential	710 m west of Precinct E
A3	Wentworth Street (south)	Residential	960 m south of Precinct E
A4	Eastern end of Gregory Street	Residential	370 m northeast of Precinct E
A5	Western end of Blanche Street	Residential	860 m southeast of Precinct E
A6	40 Bazentin Street	Residential	1,400 m southeast of Precinct E
A11	Begnell Park	Active Recreation	730 m southeast of Precinct E
A12	51-55 Roberts Road	Commercial	820 m southwest of Precinct E
A13	Greenacre Bowling Club	Commercial	1,350 m southwest of Precinct E
A14	Strathfield High School	School	1,000 m north of Precinct E
A15	St Anne's School	School	500 m northeast of Precinct E

Figure 2 Enfield ILC Representative Assessment Locations



Note 1: Precinct E is depicted in red.

5 Construction Noise and Vibration Criteria

5.1 Noise Guidelines

5.1.1 Interim Construction Noise Guideline

The NSW *Interim Construction Noise Guideline* (ICNG) (NSW EPA, 2009) sets out ways to assess and manage the impacts of construction noise on residences and other sensitive land uses. It does this by presenting assessment approaches that are tailored to the scale of the construction works.

The ICNG requires project specific Noise Management Levels (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.

5.1.2 Residential Receivers

The ICNG provides an approach for determining NMLs at sensitive receivers based on RBL for the area, as described in **Table 3**.

Table 3 Determination of NMLs for Residential Receivers

Time of Day	NML $L_{Aeq(15minute)}$	How to Apply
Standard 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	• The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq(15minute)}$ 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
		• 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:
		  • 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 hours	RBL + 5 dBA	• 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*.

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 4**.

Table 4 Construction Noise Management Levels at Other Sensitive Land Uses

Land Use	NML $L_{Aeq(15minute)}$
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

5.1.3 Commercial Premises

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 $L_{Aeq(15minute)}$
- Offices, retail outlets: external 70 dBA $L_{Aeq(15minute)}$
- For other businesses that may be very sensitive to noise, appropriate goals should be determined on a case by case basis with reference to AS2107.

5.1.4 NML Summary

The NIA defined the airborne NMLs for the various surrounding receivers. The NMLs for the receivers surrounding Precinct E are outlined in **Table 5**.

Table 5 Project Specific Noise Management Levels (dBA)

Location		Receiver Type	$L_{Aeq(15minute)}$ Construction NMLs	
			Standard Construction Hours[1]	Highly Noise Affected
A1	Eastern end of Jean Street	Residential	59	75
A2	Eastern end of Ivy Street	Residential	58	
A3	2 Wentworth Street (south)	Residential	54	
A4	Eastern end of Gregory Street	Residential	54	
A5	Western end of Blanche Street	Residential	51	
A6	40 Bazentin Street	Residential	51	
Any	Industrial		External 75 when in use	n/a
Any	Commercial		External 70 when in use	
Any	Active Recreation		External 65 when in use	
Any	Passive Recreation		External 60 when in use	
Any	Church, Cemetery		External 55 when in use	
Any	Hospital[2]		External 55 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.

5.2 Vibration Guidelines

5.2.1 Structural Damage Vibration

Structural damage vibration limits are based on Australian Standard *AS 2187: Part 2-2006 Explosives - Storage and Use - Part 2: Use of Explosives* (AS 2187) and British Standard *BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2* (BS 7385).

These standards provide frequency-dependent vibration limits related to cosmetic damage, noting that cosmetic damage is very minor in nature, is readily repairable and does not affect the structural integrity of the building.

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 6**. 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 6 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
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

5.2.2 Assessing Vibration: A Technical Guideline

The EPA's *Assessing Vibration: A Technical Guideline*, 2006, 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 VDVs 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 7**.

Table 7 Acceptable Vibration Dose Values for Intermittent Vibration (m/s$^{1.75}$) (*Assessing Vibration: a technical guideline)*

Location	Daytime[1]		Night-time[1]	
	Preferred Value	Maximum Value	Preferred Value	Maximum Value
Critical areas[2]	0.10	0.20	0.10	0.20
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.

Note 2: Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. These criteria are only indicative, and there may be a need to assess intermittent values against the continuous or impulsive criteria for critical areas.

5.2.3 Safe Working Distances

The recommended safe working distances for vibration intensive construction plant outlined in **Table 8** are referenced from the TfNSW *Construction Noise Strategy*.

Consistent with BS 7385 and the *Assessing Vibration: A Technical Guideline*, the recommendations are for the practical management of potential vibration to minimise the likelihood of cosmetic damage to buildings and disturbance or annoyance in humans.

The human comfort safe working distances are conservative, developed with reference to the more stringent objectives for continuous vibration for typical residential building constructions.

It is noted that the criteria for commercial buildings is higher than that for dwellings, therefore, the safe working distances for commercial buildings would be smaller than those outlined below. However, the below distances can still be used as a screening criteria before considering detailed assessment of vibration levels at commercial buildings.

Table 8 Recommended Safe Working Distances for Vibration Intensive Plant

Plant Item	Rating / Description	Safe Working Distance	
		Cosmetic Damage[1]	Human Response[2]
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 (Typically > 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 to 100 m
Pile Boring	≤ 800 mm	2 m (nominal)	N/A
Jackhammer	Hand held	1 m (nominal)	Avoid contact with structure

Note 1: Referenced from British Standard BS 7385 Part 2-1993.

Note 2: Referenced from *Assessing Vibration: A Technical Guideline*.

It is noted that a rail siding and wheel lathe runs adjacent to the western boundary of Precinct E. While the siding infrastructure is unlikely to be sensitive to vibration from works in Precinct E, the cosmetic damage criteria in **Table 8** should be used as a screening criterion where vibration intensive works are proposed to be undertaken in the vicinity of the siding.

The sensitivity of infrastructure (including the wheel lathe) within the rail siding corridor to vibration should be confirmed with the owner/operator of the siding.

6 Construction Works

6.1 Construction Activities

The NIA for Precinct E included a construction noise impact assessment (refer to SLR Report *610.16722.00500 V1.3*) which included noise predictions from a number of construction scenarios likely to occur on site. The construction scenarios are reproduced below in **Table 9**.

Table 9 Construction Activities

Construction Scenario (assessed in NIA)	Applicable Construction Activities	Approximate Timeframe
Earthworks	Site set up including environmental controls, bulk earthworks and spoil removal	November 2019 to February 2020
Stormwater drainage system	Stormwater services, in ground services	November 2019 to February 2020
Retaining walls / embankments	Retaining walls, footings, foundations and anchors, external works including pavements and landscaping	November 2019 to June 2020
Warehouse construction	Building delivery and installation, internal works including floor slabs and fitouts	February 2020to June 2020

6.2 Hours of Construction

In accordance with Condition 2.15, site preparation and construction activities associated with Precinct E that would generate audible noise at any residential premises shall only be undertaken during the following hours:

- 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;
- 8:00 am to 1:00 pm on Saturdays; and
- at no time on Sundays or Public Holidays.

This condition does not apply in the event of a direction from police or other relevant authority for safety reasons.

In accordance with Condition 2.16, the hours of site preparation and construction activities specified above may be varied with the prior written approval of the Planning Secretary. Any request to alter the hours of construction specified under Condition 2.15 shall be:

- considered on a case-by-case basis;
- accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and
- accompanied by sufficient information for the Planning Secretary to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site.

6.3 Construction Noise Predictions

Detailed information regarding the construction works for Precinct E has been provided and the construction noise predictions included in the NIA have been updated to account for changes in site layout and methodology. The predicted exceedances of the NMLs from the Precinct E works are presented in **Table 10**.

Table 10 Predicted NML Exceedances

Receiver	Description	Noise Level (dBA)					
		Worst-case Predicted (any scenario)	NML	NML Exceedance			
				Earthworks	Stormwater Drainage	Retaining Walls	Warehouse Construction
A1	Eastern end of Jean Street	54	59	-	-	-	-
A2	Eastern end of Ivy Street	51	58	-	-	-	-
A3	Wentworth Street (south)	53	54	-	-	-	-
A4	Eastern end of Gregory Street	63	54	9	5	6	7
A5	Western end of Blanche Street	57	51	6	2	3	4
A6	40 Bazentin Street	48	51	-	-	-	-
A11	Begnell Park	58	External 65 when in use	-	-	-	-
A12	51-55 Roberts Road	55	External 70 when in use	-	-	-	-
A13	Greenacre Bowling Club	49	External 70 when in use	-	-	-	-
A14	Strathfield High School	54	External 55 when in use	-	-	-	-
A15	St Anne's School	59	External 55 when in use	4	-	1	2

Note 1: Colouring indicates the range of predicted worst case NML exceedances without any additional mitigation based on nearest receiver (red >20 dB, orange 11 - 20 dB, yellow 1-10 dB).

Table 10 shows that the worst-case noise levels at the most affected receivers are predicted to be up to 63 dBA during Earthworks.

In general, the construction works are predicted to result in relatively minor exceedances of the daytime NMLs during the worst-case noise impacts. NML exceedances of up to 9 dB are predicted at the most affected receiver to the east of Precinct E and up to 6 dB at receivers located to the west.

The predicted levels do not exceed the Highly Noise Affected criterion of $L_{Aeq(15minute)}$ 75 dBA.

6.4 Construction Vibration

Vibration intensive items of plant proposed for use during the construction works would include plate compactors and vibratory rollers. These items of equipment would likely be used during earthworks.

The nearest residential receivers to the development are located approximately 380 m to the west and 600 m to the east from the nearest point of Precinct E, outside of the safe working distances from vibration intensive equipment shown in **Table 8**. As such, the separation distance between the works and the nearest receivers is considered likely to be sufficient to mitigate potential vibration generated from the works.

Other existing industrial and commercial sites are however located around 40 m from the construction site, which could result in perceptible levels of vibration at these locations.

An existing rail siding is located adjacent to the western boundary of the site, as discussed in **Section 5.2.3**. The cosmetic damage criteria in **Table 8** should be used as a screening criterion where vibration intensive works are proposed to be undertaken in the vicinity of the siding. The sensitivity of infrastructure (including the wheel lathe) within the rail siding corridor to vibration should be confirmed with the owner/operator of the siding.

Where possible, use of alternative less vibration intensive techniques will be adopted.

7 Mitigation and Management Measures

All feasible and reasonable mitigation measures will be implemented by the project. Impacts from the construction works will be minimised and managed in accordance with the procedures detailed below in **Table 11**.

Table 11 Environmental Management Controls for Construction Noise – Source Control

Item	Measure
Project Planning	Where possible, use alternative less noise and vibration intensive construction techniques to rock breaking and concrete sawing.
	Power tools to use mains power rather than using generators.
	Complete works during standard daytime construction hours.
	Truck routes to site should be limited to major roads.
Scheduling	Respite offers should be considered where high noise and vibration generating activities are near receivers. As a guide, work should be carried out in blocks that do not exceed three hours, with a minimum respite period of one hour between each block.
	Consult with the affected community to determine the need for respite periods.
Site Layout	Site entry and exit points to be located as far as possible from sensitive receivers, where possible.
	Compounds and worksites to be designed to promote one-way traffic and minimise the need for vehicle reversing.
	Position work compounds, parking areas, and equipment and material stockpiles away from noise-sensitive locations.
Training	Training to 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.
Plant and Equipment Source Mitigation	In accordance with Condition 2.13, noise emissions from plant and equipment operated on the site shall be minimised by installing and maintaining, wherever practicable, efficient silencers, low noise mufflers (residential standard) and by replacing reversing alarms with alternative non-tonal or silent measures, such as quackers or flashing lights (subject to occupational health and safety requirements).
	Noisy plant or processes should 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 should be avoided if possible.
	Operate plant and equipment in the quietest and most efficient way, including not idling vehicles or equipment unnecessarily.
	Siting noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area; or orienting the equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise.
	Regular and effective maintenance of noise generating equipment, including checking of hatches/enclosures regularly to ensure that seals are in good condition and doors close properly against seals.
	Avoid dropping materials from a height.
	Use dampened ‘city’ rockbreakers / jackhammers where possible.

Item	Measure
	Avoiding noisy plant working simultaneously close together.
	Carrying out loading and unloading away from noise sensitive areas.
	No queuing of trucks outside residential properties. Truck drivers should avoid compression braking as far as practicable.
	Ensure truck movements are kept to a minimum i.e. trucks are fully loaded on each trip.
Screening	Install purpose-built screening or enclosures around long-term fixed plant where possible.
	Site layout should take advantage of existing screening from local topography. Position site huts, maintenance sheds and/or shipping containers between noisy equipment and the affected receivers.
Community Consultation	Notifications should be provided to the affected community where high impacts are anticipated or where out of hours works are required. Notification should be a minimum of five working days.
	Where complaints are received, the work practices are to be reviewed and feasible and reasonable mitigation and management measures implemented to minimise any further impacts.
Monitoring	Noise and/or vibration monitoring may be required in response to any complaints received to verify that levels are not substantially above the predicted levels.
Vibration	Where works are required within the safe working distances, vibration intensive activities must be kept to a minimum.
	Where works are required within the cosmetic damage safe working distances, building condition surveys be completed before and after the works to ensure no cosmetic damage has occurred.

7.1 Monitoring

Construction noise and vibration impacts were previously assessed for Precinct E as part of the NIA. Project specific NMLs have been established, as outlined in **Section 5.1.4**.

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. Noise and/or vibration monitoring may be required in response to any formal complaints received to verify that levels are not substantially above the predicted levels.

Should monitoring be required in the case of receipt of a complaint regarding noise or vibration, monitoring will be conducted by suitably qualified specialists. The location and extent of attended monitoring will be determined in consultation with project staff 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.

All items of acoustic instrumentation utilised will be designed to comply with IEC 61672.1-2004 *Electroacoustics – Sound level meters* (AS IEC 61672) and carry current calibration certificates.

7.2 Community Consultation and Liaison

NSW Ports undertake regular community consultation which includes:

- Quarterly meetings of the Enfield Community Liaison Committee (CLC);
- Regular resident updates i.e. a letterbox drop of information to targeted residents; and
- On-going communication of the project contact details for complaints and enquiries including site signage, website and on hard copy material.

As required by Condition 5.2 of MP 05_0147, a clearly visible sign will be installed at the site access prior to commencing construction. Relevant contact details for Qanstruct and NSW Ports, including a phone number, postal address and email for community enquiries, will be included on site signage.

All community enquiries received by Qanstruct will be forwarded to NSW Ports. Complaints response will be coordinated through NSW Ports.

8 Complaints Register

Complaints will be able to be made via a dedicated contact telephone number which will be included on the site signage. Responses will be provided to the complainant within 24 hours.

Information recorded in the complaints register with respect to each complaint will include:

- Date and time of complaint.
- Name, address and telephone number of complainant.
- Nature of complaint.
- Response actions taken to date.

The complaints register is maintained by NSW Ports and is available for inspection at any time by the Secretary of the DPE.

Preliminary investigations into the complaint will commence within 48 hours of the complaint receipt and adequate measures to identify and manage will be considered. Refer to the CEMP for full details of the environmental complaints handling procedure.

9 Contingency Plan

In the event that a non-compliance with the noise conditions is identified, Qanstruct will implement the following Contingency Plan:

- Qanstruct will report any non-compliance to the relevant regulatory authorities within five working days.
- Qanstruct will identify an appropriate course of action with respect to the identified impact(s), in consultation with specialists and the relevant regulatory authorities, as necessary.
- Qanstruct will notify affected landholders and tenants at the location of the exceedance within five working days and provide them with details of actions taken, including noise or vibration monitoring results (if applicable), until it can be shown that the site is complying with the noise and vibration criteria.
- Qanstruct will, on request, submit the proposed course of action to the relevant regulatory authorities for approval.
- Qanstruct will implement the approved course of action.

10 Internal audits

Periodic internal audits will be conducted to ensure that the development consent conditions and commitments and environmental management controls outlined in this CNVMP are being properly implemented. Audit reports will be used to inform of any corrective actions.

NSW Ports last commissioned an annual Independent Environmental Audit in November. Annual audits will continue and these works will be subject to that audit. Refer to the CEMP for full details of the environmental auditing requirements.

11 Review and Improvement of Noise Management Plan

This CNVMP will be reviewed, and if necessary, updated in the following circumstances:

- Significant changes to the equipment, machinery and plant operated within Precinct E
- Where it is identified via monitoring that the performance of Precinct E is not meeting the objectives of the CNVMP
- At the request of the relevant regulatory authority or other relevant government agency.

All employees and contractors will be informed of any revisions to the CNVMP by Site Management during toolbox talks.

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

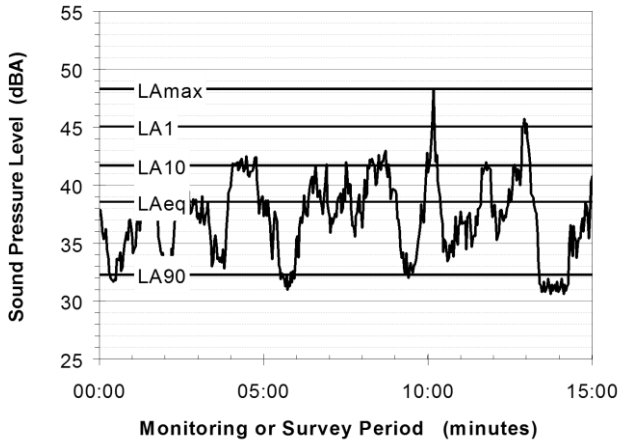
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

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 L_{AN}, where L_{AN} is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the L_{A1} is the noise level exceeded for 1% of the time, L_{A10} 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:

L_{A1} The noise level exceeded for 1% of the 15 minute interval.

L_{A10} The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

L_{A90} 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.

L_{Aeq} 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

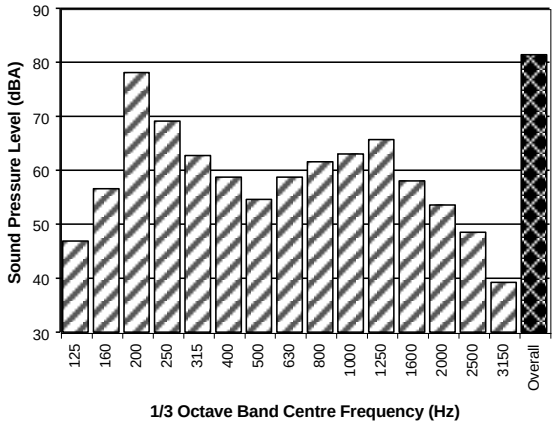
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal.

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/Vo), where Vo 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

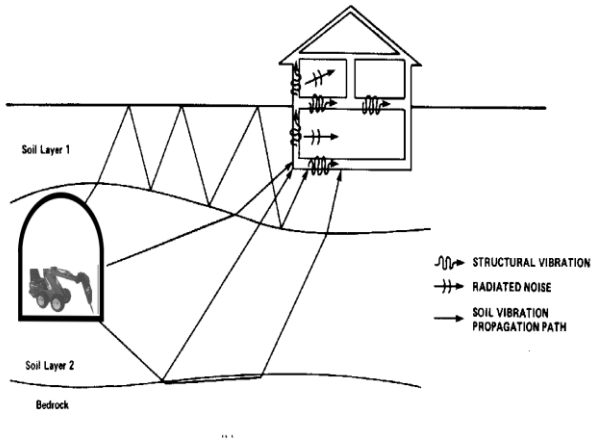
People are able to 'feel' vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual's perception of motion or response to vibration depends very strongly on previous experience 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.

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APPENDIX F

Construction Traffic Management Protocol

Prepared for

GOODMAN PROPERTY SERVICES (AUST) PTY LTD

Construction Traffic Management Plan

Enfield Industrial Logistic Centre (EILC) – Precinct E
Mainline Road, Strathfield South

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15/01/2020

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	14/01/2020	Issue II	M. Tangonan	M. Tangonan

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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 Precinct E (the Site) of the Enfield Intermodal Logistic Centre (ILC). A location plan is provided in Figure 1. The Enfield ILC, and essentially the Site, is located within the Strathfield Municipal Council LGA.

Condition 6.3(b) of the modified Project Approval (MP05_0147) – August 2018 – issued by the Department of Planning and Environment (DPE) requires construction traffic measures including:

- a Construction Traffic Management Protocol to detail how heavy vehicle movements associated with the project will be managed during construction. The Protocol shall specifically address the movement of oversize loads to and from the site, the management of construction traffic, restrictions to the hours of heavy vehicle movements to avoid road use conflicts, and the transport of construction waste materials, and
- a Driver's Code of Conduct which details traffic management measures to be implemented during construction to:
  - minimise impacts of the project on the local and regional road network,
  - minimise conflicts with other road users,
  - ensure truck drivers use specific routes and access points, including no left turn access from Cosgrove Road, and
  - minimise traffic noise, particularly during night times hours.

In addition to the above, the Enfield ILC Overarching Construction Environmental Management Plan (OCEMP) was prepared by NSW Ports in March 2014 and it was approved by the Secretary of Department of Planning and Environment.

Section 3.3.1 of the OCEMP addresses a number of mitigation measures to all of the proposed contractors at ILC to reduce the impact of the construction traffic. Accordingly, it is anticipated that each sub-precinct within ILC shall prepare specific CTMPs to detail the relevant construction works and addresses the requirements of the OCEMP.

Furthermore, it is noteworthy that a Traffic Impact Assessment (TIA) was prepared by Ason Group to support a modification to the Project (MOD 14) which provides an assessment of the relevant traffic,

transport and parking implications of the Enfield ILC under future 'operational' conditions. That TIA also includes a preliminary section with regard to Construction Traffic Management Plan principles.

Accordingly, this CTMP has consideration to the MOD 14 TIA in several sections.

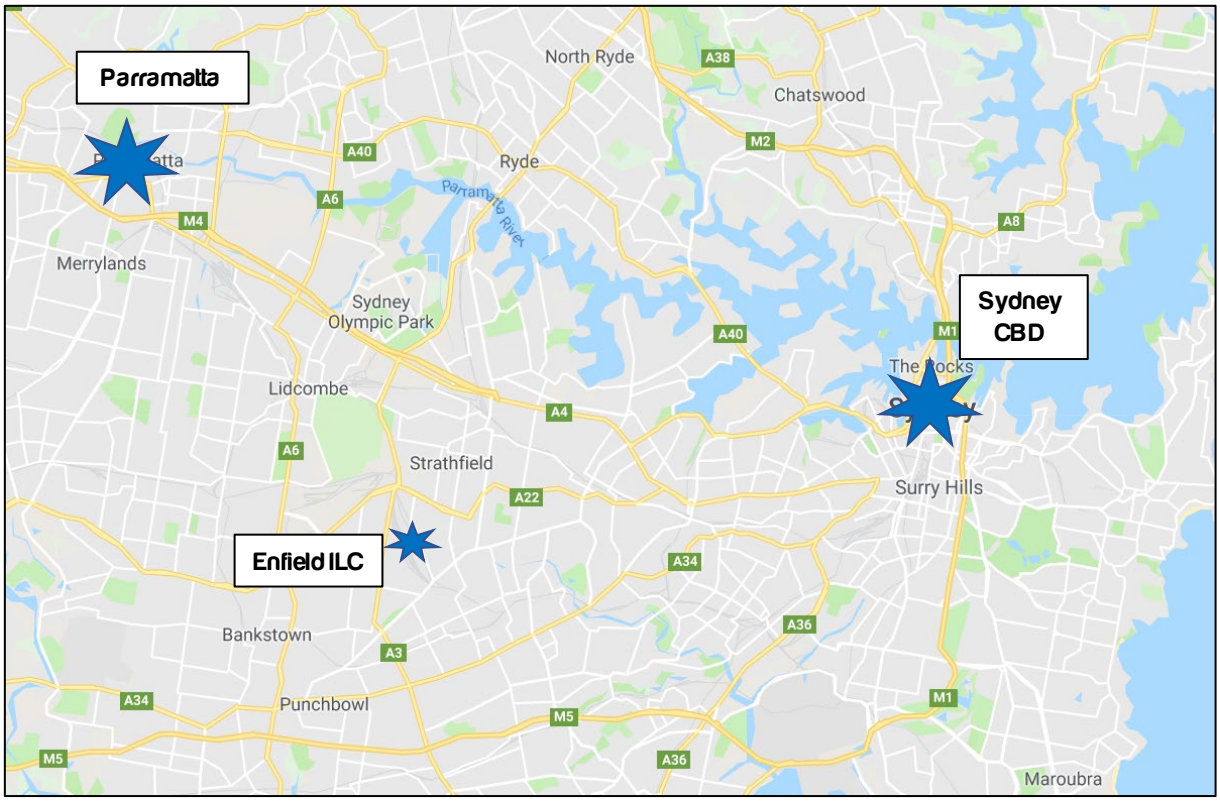

Figure 1: Location Plan

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 operations and efficiency,
- Ensure the safety of workers, pedestrians and other road users,
- Provide information regarding the construction vehicle access routes and any changed road conditions (if applicable), and
- Outline relevant requirements of the NSW Ports Overarching CEMP site-specific measures detailed in Section 3.3.1 of that document.

This plan shall 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 Group is responsible for the preparation of this Plan only and not for its implementation, which is the responsibility of the Contractor.

1.3 Statutory Requirements

1.3.1 Safe Work of Australia

The Safe Work Australia (SWA) provides general Guidelines for different CTMPs (Traffic Management Guide: Construction Work – July 2013) in any construction workplace. Key issues which are to be considered for managing traffic at construction workplaces as indicated by SWA are summarised in **Table 1**. The SWA addresses these issues to the businesses and contractors who oversees the construction works to ensure that workers and others impacted by the construction works are not, as reasonably practicable exposed to any health or safety risks. With respect to the construction works envisaged for Precinct E, Qanstruct (Aust) Pty Ltd has been appointed, therefore, the issues / requirements outlined below SHALL be addressed to them in the first instance.

Table 1: SWA – Issues to Consider for CTMPs

Reference	Issue	Response (in relation to Precinct E)
1	Keeping pedestrians and vehicles apart including on site and when vehicles enter and exit the workplace.	The contractor shall consider implementing the following: ▪ Separate traffic routes for pedestrians and vehicles, where possible, ▪ Provide separate and clearly marked pedestrian paths, ▪ Creating pedestrian exclusion zones where powered mobile plant is operating, ▪ Create vehicle exclusion zones for pedestrian-only areas, e.g. around tearooms, amenities and pedestrian entrance, ▪ Secure areas where vehicles and powered plan operate by installing pedestrian barriers, traffic control barricades, chains or bollards, ▪ Provide designated parking areas for workers and visitors, ▪ Provide clearly signed and lit crossing points where walkway cross roadways, ▪ Using Traffic Controllers, mirrors, stop signs or warning devices at Site exits to make sure drivers can see or are aware of pedestrians, ▪ Avoid clogging walkways, and ▪ Scheduling work so vehicles, powered mobile plant and pedestrians are not in a same area at the same time.
2	Minimising vehicle movements	To limit the number of vehicles at a workplace the proposed contractor shall consider: - Planning storage areas so that delivery vehicles do not need to cross the Site, - Providing separate staff and visitor parking, - Scheduling the workforce to minimise the number of vehicles on Site, - Encouraging the staff to attend the Site outside the road network peak hours, and - Discouraging staff to utilise private motor vehicles.
3	Eliminating reversing vehicles or minimising the related risks	**No reversing SHALL occur to/from Cosgrove Road and Mainline Road.** Furthermore, to limit the reversing movements on Site, the contractor shall: - Organise for mirrors and non-tonal reversing alarms (or other safe and silent reversing systems that meet WH&S requirements) on vehicles, - Ensure a signal person wearing high visibility clothing assists the reversing trucks on Site, in the event that the reversing movement cannot be eliminated, - Ensuring workers are familiar with reversing areas, - Reversing areas / parking areas / loading areas to be clearly marked-up to best communicate with the workers, - Ensure plant operators are aware of workers who may be in the vicinity of swing radius, articulation points and overhead movement for their vehicles.

Reference	Issue	Response (in relation to Precinct E)
4	Ensuring vehicles and pedestrians are visible to each other	Refer item 1 response.
5	Using traffic signs, warning devices and visibility	The contractor must note that: ▪ Appropriate signs shall be used to alert workers from potential hazard, ▪ Traffic routes shall be clearly signed to indicated restricted parking, visitor and staff parking, allowable head rooms, speed limits and other necessary enforcements, ▪ Workers shall be clearly informed (as practicably possible) about any possible hazard such as bad weather, adverse lighting, shadows etc. ▪ Installation and implementation of the following measures can assist: 1- mirrors, 2- visual warning devices such as flashing light, 3- appointing a trained person to control manoeuvres, 4- ensuring high visibility cloths are worn, 5- communication devices such as radio and other calling devices.
6	Developing and implementing a traffic management plan	Relevant traffic management plan shall be proposed (some of which are as follows): ▪ Designated travel plan for vehicles, ▪ Pedestrian and traffic routes, ▪ Designated delivery plans, ▪ Plan to indicate, how often and where vehicles and pedestrians may interact.

1.3.2 NSW Ports Overarching CEMP

NSW Ports, as the primary stakeholder for the overall Enfield ILC, has previously prepared an Overarching CEMP which outlines broader guidelines and strategies to be adopted by subsequent site-specific CTMPs. Section 3.3.1 of the NSW Ports CEMP discusses the relevant elements of a CTMP Protocol as follows:

- **Aim** – to ensure that construction activities do not impact on the operation of the ILC and the surrounding road network.
- **Assessment of Risks** – the scope of the Overarching CEMP is to ensure that:

1) the construction works results in very minor construction traffic numbers with minimal impacts predicted and the majority of works unlikely to require the use of heavy vehicles.

2) where heavy vehicles are required (e.g. the delivery of plant / equipment), the contractor induction process and EWMS will include requirements for heavy vehicles to utilise main roads and avoid residential back streets.

3) any transportation of construction waste materials will be undertaken by suitably qualified waste contractors and all loads will be covered when leaving the site.

4) where required, NSW Ports will notify the Road Transport Coordination Group of the proposed works prior to construction commencing, if consultation is warranted due to the risk profile of the works.

- **Mitigation Measures** – All contractors and NSW Ports staff working on site will implement controls to further reduce the impact of construction traffic, where applicable. NSW Ports OCEMP provides a list of mitigation measures which is technically addressed to the operators of each Precinct and their construction contractors. These measures shall be taken into consideration during the construction stage.

The following **Table 2** summarises the measures and outlines the relevant responses to each measure in relation to Precinct E.

Table 2: NSW Ports – Mitigation Measures

Reference	Mitigation Measure	Response (in relation to Precinct E)
1	On-site parking and lay-down areas will be clearly delineated and communicated to staff and contractors.	Details of parking arrangements, site access locations shall be included within Site Induction process. All necessary works will be undertaken within the Precincts. The on-site parking shall be appropriately marked to better delineate the laydown areas.
2	Signage and appropriate speed limits within the site will be implemented where applicable.	Mainline Road is clearly signposted with a speed limit of 40km/hr. Speeds within the off-street works area shall be adjusted to suit prevailing conditions. A general speed limit on-site shall be 10 km/hr to minimise the risk to workers.
3	If roads need to be closed, relevant approvals will be obtained, and traffic controllers will be utilised where required.	It is anticipated that no works will be undertaken on public roads or carriageways. In the event that lane closures are required, then appropriate Traffic Control Plans shall be prepared (and approved) prior to implementation.
4	All contractors and staff will be required to comply with on-site traffic requirements.	Noted. This Statement shall form a standard requirement of the Site Induction process.

Reference	Mitigation Measure	Response (in relation to Precinct E)
5	No obstruction of public or internal roads by any materials / vehicles without obtaining the necessary approvals.	Noted. It is anticipated that no works will be undertaken on public roads or carriageways. All construction vehicles will be parked within the Precincts at all times.
6	Vehicle movements / deliveries utilising heavy vehicles will be undertaken within approved construction hours noted below and where possible, outside of peak traffic times (i.e. 8am to 9am and 5pm to 6pm): - 7:00am to 6:00pm, Monday to Fridays inclusive - 8:00am to 1:00pm on Saturdays; and - At no times on Sundays or public holidays.	**The contractor to NOTE.**
7	Other project specific controls for traffic management as determined by the Risk Assessment (Appendix F).	**The contractor to NOTE.**

- **Monitoring** – Impacts of the construction works will be monitored by leading contractor and NSW Ports through an ongoing process. In the events that the construction works significantly impact on regional traffic or complaints are reported the NSW Ports will work cooperatively with the project construction contractors to resolve the issues. Furthermore, If the contractor receives a complaint this should be forwarded on to NSW Ports to manage in consultation.

2 Overview of Works

2.1 Hours of Work

Having regard for condition 2.15 of the Project Approval the Proponent shall only undertake site preparation and construction activities associated with the project that would generate audible noise at any residential premises during the following hours:

- 7:00AM – 6:00PM Mondays – Fridays, inclusive;
- 8:00AM – 1:00PM on Saturdays; and
- at no time on Sundays or public holidays.

It is also noteworthy that the condition 2.16 states that the above construction hours can be varied with the prior written approval from the Planning Secretary and any request to alter the construction hours shall be:

- considered on a case-by-case basis,
- accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and
- accompanied by sufficient information for the Planning Secretary to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the Site.

2.2 Works Stages

It is anticipated that the construction works will commence in March 2020. The construction works for Precinct E have been estimated to take up to 44 weeks. The construction activities and timing are as follows:

Table 3: Construction Timeline

Timing	Duration (weeks)	Activity
Week 0	-	Head Contract Execution
Weeks 1 - 2	1	Construction Certificate & Site Establishment
Weeks 2 - 12	10	Bulk & Detail Earthworks

Timing	Duration (weeks)	Activity
Weekss 10 – 20	10	Footings, Retaining Wall, Backfill
Weeks 20 - 26	6	Structure
Weeks 23 - 33	10	Roofing, Services, Cladding
Weeks 31 - 37	6	Warehouse Slabs & Joint Sealing
Weeks 34 - 42	8	Office Weatherproofing, Base Building fit out / finishes
Weeks 40	-	Early Access
Weeks 38 - 44	6	External Works Commissioning Practical Completion

2.3 Site Overview

The Site includes Precinct E which is detailed as follows.

Table 4: Site Detail

Precinct	Legal Address	Site Area (ha)
E	Lots 3 and 4 in DP1183316	2.19

The Site encompasses a total of 7,604 m^2 of total Building area for two (2) new Buildings with the following breakdown of warehouse/office:

- Building E1 4,450m^2 (4,000m^2 warehouse / 450m^2 office), and
- Building E2 3,154m^2 (2,854m^2 warehouse / 300m^2 office).

The Site location in context of the entire ILC is shown in **Figure 2**.

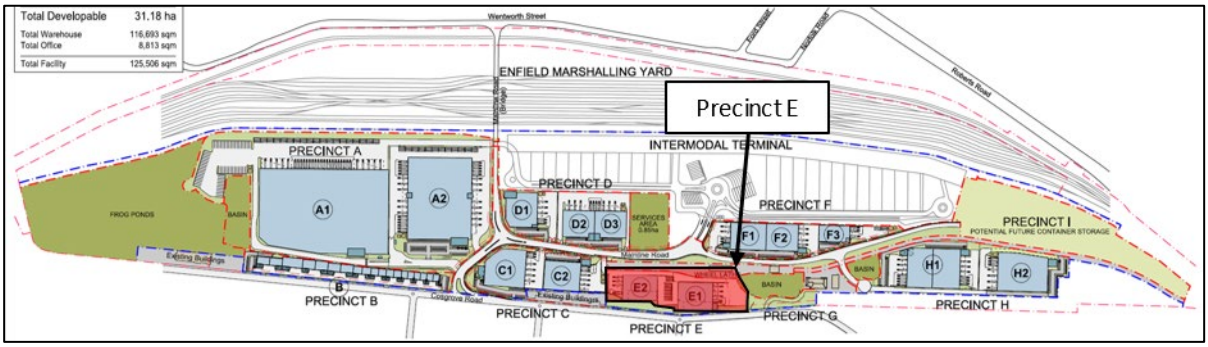

Figure 2: Subject Site Location

2.4 Precinct E Details

2.4.1 Proposed Access Arrangements

It is anticipated that all construction and service vehicles will utilise the permanent access crossover indicated in **Figure 3** for Precinct E.

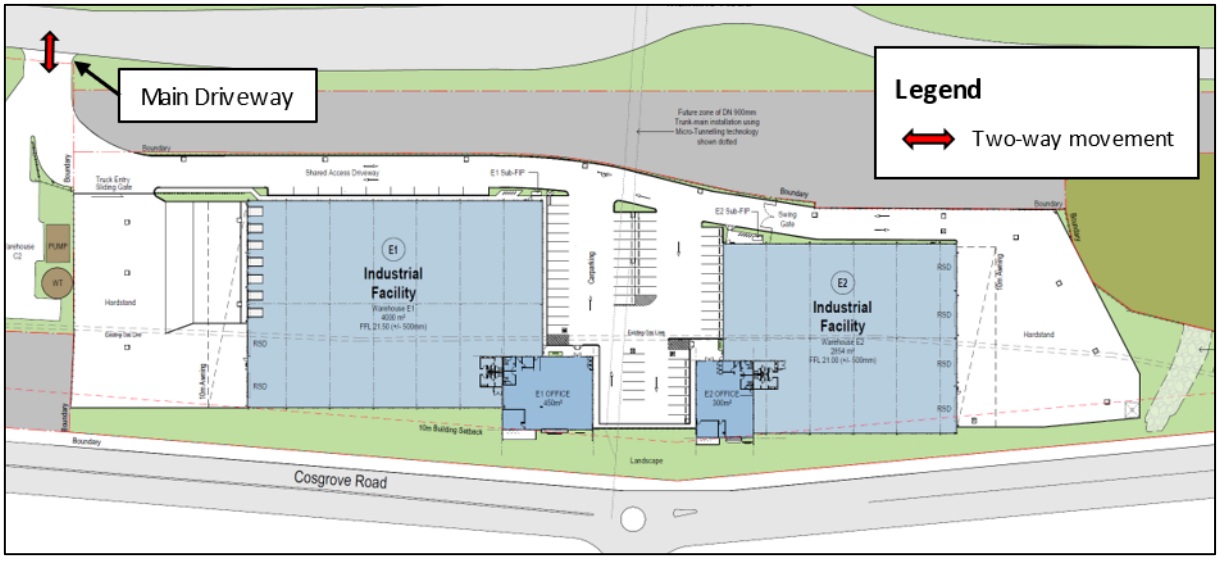

Figure 3: Precinct E Access Plan

The above accessway connects to Mainline Road. Accordingly, site-specific Traffic Control Plans are not anticipated to be be required for this location.

2.4.2 Contractor Parking

Temporary contractor parking arrangements for Precinct E are expected to be located on Site. As a general practice the contractors will provide temporary amenities for the workers onsite. These amenities will normally be as follows:

- A main office;
- Lunch, meeting and induction rooms, and
- Toilets.

2.5 Loading / Unloading Locations

With reference to Item 1 of Table 2, construction vehicles for each Precinct shall utilise future car parking and hardstand areas for their respective buildings.

For Precinct E, the location of the loading / unloading activities for both Warehouse and Office buildings will occur in the respective Warehouses' hardstand areas.

2.6 Construction Workforce

The following number of staff / contractors are expected to be on Site at any one time:

- Average of 35, and
- A maximum of 50.

3 Existing Conditions

3.1 Site Details

3.1.1 Enfield ILC

The Enfield ILC site is located within Strathfield Municipal Council LGA in Strathfield South approximately 4.0 kilometres south of Strathfield and 15 kilometres south-west of Sydney CBD. It has an area of 593,200m^2 with frontages to industrial buildings to the north, Cosgrove Road to the east, Punchbowl Road to the south and Wentworth Street to the west.

The Enfield ILC is located within the Metropolitan Freight Network (MFN), which is a dedicated rail freight line between Port Botany past the ILC and towards Sefton Junction (for southbound services) as shown below in **Figure 4**. This rail line has the ability to operate 24 hours a day without interruption from passenger rail services, which generally take priority for shared passenger/freight rail lines.

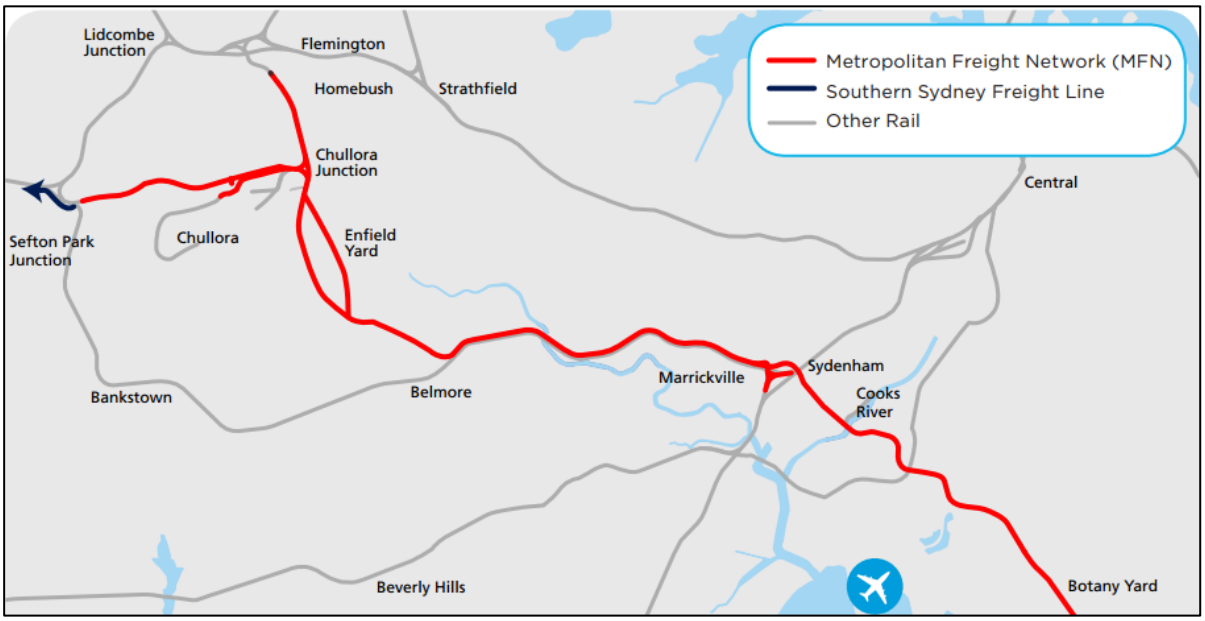

Figure 4: Sydney Metropolitan Freight Network

3.1.2 Enfield ILC Access Routes

A Site Plan is presented in **Figure 5** which provides an appreciation to the existing conditions. The existing ILC site can be accessed via the following routes:

- Mainline Road from Wentworth Street which provides full turning movements

- Turnout Drive from Cosgrove Road which permits full turning movements in, however restricts left turn movements in and right turn movements out for trucks.

Figure 5: ILC Site and Road Hierarchy

3.2 Road Hierarchy

The key roads providing in the vicinity of the site are summarised below:

- Hume Highway / Liverpool Road – A classified RMS Highway (HW2) that generally runs in an east-west direction to the north of the ILC site and carries approximately 53,000 vehicles per day (bidirectional). It generally carries 3 lanes of traffic in each direction and is subject to a speed limit of 60km/hr.
- Roberts Road –A classified state main road (MR200) that traverses in the north-south direction to the west of the ILC site. It generally carries 3 lanes of traffic in each direction and 44,000 vehicles per day (based on survey data). A speed limit of 70km/hr applies to Roberts Road. It forms one of the primary access routes to the Site via a signalised intersection with Norfolk Road.
- Punchbowl Road – A classified state main road (MR549) that traverses in the east-west direction to the south of the Site carries approximately and carries 26,900 vehicles per day. It generally carries 2 lanes of traffic in each direction. A speed limit of 60km/hr applies to this road.
- Cosgrove Road – An unclassified RMS regional road (RR7062) that traverses the north-south direction and forms the eastern ILC site frontage between Liverpool Road to the north and Punchbowl Road to the south and carries an estimated 11,820 vehicles per day (from peak hour survey data). It generally carries a single lane of traffic in each direction in addition to kerbside parking. A speed limit of 60km/hr applies to this road.
- Norfolk Road – a local road that generally runs in the east-west direction to the west of the ILC. It acts as the connecting street between Wentworth Street and Roberts Road and carries a single lane of traffic in both directions and 3,160 vehicles per day (from peak hour survey data). A speed limit of 50km/hr applies. Turning restriction at the intersection of Roberts Road / Norfolk Road are intended to prevent east-west movements from the industrial areas around Wentworth Street and the residential areas west of Roberts Road.
- Wentworth Street – a local road that generally runs in the north-south direction. It carries a single lane of traffic in both directions in addition to kerbside parking and applies a speed limit of 50km/hr
- Mainline Road – a local private road, generally within the ILC site, that provides a connection between the ILC and Wentworth Street. It provides a bridge crossing over the rail line, which was constructed as part of the Project under the original consent. Mainline Road provides primary access to Precincts E and operates under a speed limit of 40km/hr. No stopping signs are provided along both sides of Mainline Road.
- Turnout Drive – a local private road within the Site which provides a connection between Mainline Road and Cosgrove Road. All vehicles exiting Turnout Drive to the east must travel north on Cosgrove Road having regard for the slip lane and splitter island at that intersection.

- Delec Lane – is an existing lane which connects Mainline Road to the Precinct E. Delec Lane forms a T-intersection with Mainline Road.

The existing geometry at key intersections in this vicinity is presented in **Figure 6**.

Figure 6: Key Local Access Intersections

3.3 Public and Active Transport

3.3.1 Mode Share

The relevant mode share for persons employed within the locality are summarised in **Figure 7**.

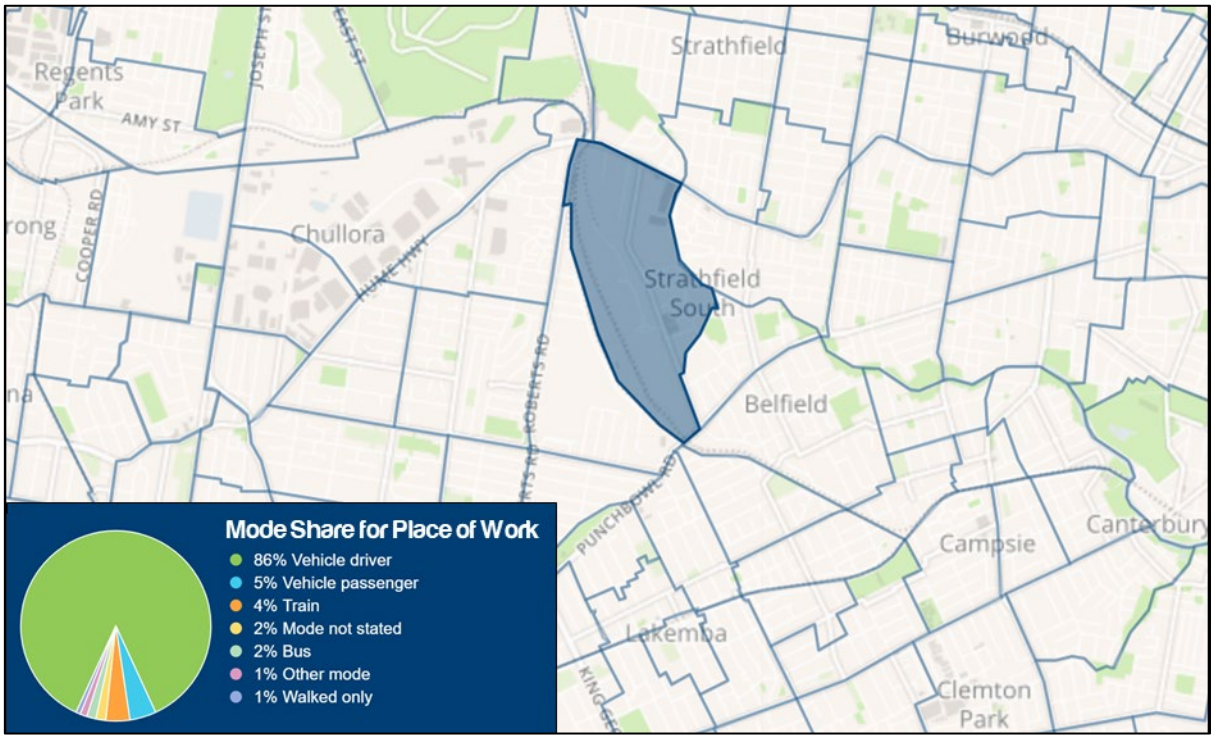

Figure 7: Current Journey-to-Work Mode Share

It is evident that only a small proportion of employees within the locality cycle or use public transport for travel to/from the precinct. Furthermore, it is noted that this data includes sites located much closer to rail and bus services than the subject site. Accordingly, staff associated with the subject site could be expected to rely more heavily on 'vehicle driver' and 'vehicle passenger' travel modes.

The key rail and bus services local to the Site are presented **Figure 8** and summarised below.

3.3.2 Railway Services

The *Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area* (Transport for NSW, December 2013) state that rail services influence the travel mode choices of areas within 800 metres walk (approximately 10 minutes) of a railway station. The closest stations are approximately 2.3 km from the site and include Lakemba and Belmore Railway Station on the T3 Bankstown line.

3.3.3 Bus Services

Having regard to the standard bus travel, the *Integrated Public Transport Service Planning Guidelines* state that bus services influence the travel mode choices of sites within 400 metres (approximately 5 minutes) of a bus stop. Nearby bus stops are 700 metres or more away and provide connections to Liverpool, Bankstown, Burwood, Hurstville, Strathfield and Greenacre. However, as is evidenced by

the travel mode data summarised in Section 3.3.1, these services are unlikely to be used by employees due to their distance from the site.

In summary, the Site has poor access to public transport services with greater than 400 metres walking distance to bus stops on the surrounding roads. Furthermore, there are no cycle routes in close proximity to the Site. As such, existing (and future) employees predominantly drive to the Site.

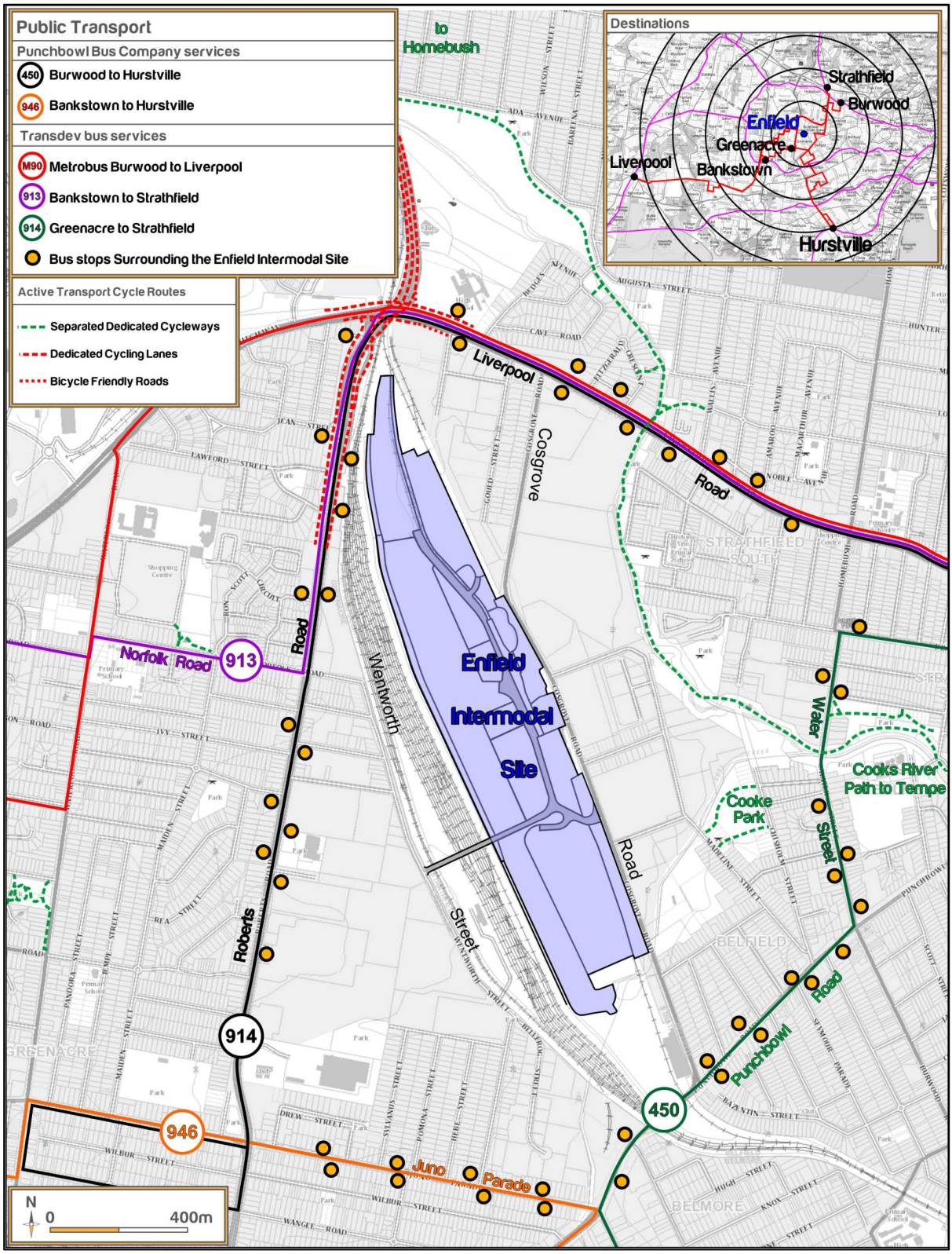

Figure 8: Public Transport Network

4 Management Plan

4.1 Traffic Movement Restrictions

4.1.1 Background

The MOD 14 TIA (Ason Group Ref: 0440r03v5), outlined the following traffic figures with regard for future operational traffic volumes associated with Precinct E. Details regarding the overall generation of the Enfield ILC are also presented below for context.

Table 5: MOD 14 Traffic Generation

Precinct	AM Peak Hour Generation (vph)	PM Peak Hour Generation (vph)	Daily Generation (vpd)
E	12	12	159
TOTAL Enfield ILC	**379**	**341**	**3,424**

4.1.2 Construction Traffic Volume Threshold

The contractor shall ensure that the construction traffic volumes will not – at highest construction traffic demand – exceed the 3,424 veh/day so that the construction traffic will not have additional traffic impact on the external road network and intersections. In this regard, the contractor shall monitor traffic movements during the construction process so that the cumulative traffic movements (both construction and operational from other precincts at the time of construction) do not exceed the relevant threshold.

Notwithstanding, the head contractor shall:

- Actively encourage carpooling by staff, wherever practicable.
- Monitor overall contractor staff movements. Should these figures exceed those volumes during peak construction works, then the Contractor shall provide a shuttle bus in accordance with the condition 2.1 to provide access between the Site and existing public transport facilities, including Strathfield train station.

4.1.3 Driver Code of Conduct

All drivers shall adhere to the Driver Code of Conduct, outlined in Section 5.

4.1.4 Loading & Materials Handling

All deliveries and materials handling are to occur on-site at all times.

4.1.5 Work Zone Requirements

NO on-street Work Zones are permitted on public roads / carriageways / verges.

4.1.6 Pedestrian Management

Wire mesh 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 TCPs, as outlined below.

4.1.7 Traffic Control Plans

All Traffic Control Plans (TCPs) shall be prepared by an accredited person, in accordance with the RMS *Traffic Control at Worksites Manual* and AS1742.3.

Site-specific TCPs shall be required for any works directly affecting existing roads, “public” footpaths or verge areas.

Approval for relevant TCPs shall be obtained from the relevant Authorities, where applicable:

- NSW Ports Private roads (within the broader Enfield ILC area)
- Council Surrounding public roads
- RMS Classified roads, or where seeking implementation of speed zone controls.

(NOTE: this shall require submission of a Road Occupancy License (ROL) application)

4.2 Construction Management Mission

4.2.1 Critical Details Summary

It is anticipated that the access crossovers will be constructed prior to the other construction works. Accordingly, the critical information is outlined in **Table 6**.

Table 6: Stage Summary

Criteria	Response
Description of Key Activities	Construction of Precinct E
Max. Vehicle Size	Semitrailers
Truck Movement Frequency	<3,424 veh/day (total ILC including operational and construction traffic)
Truck Access Requirements	See below. Primarily via Mainline Road and Cosgrove Road.
Vehicle access / egress in a forward direction (Y / N)	Y
Contractor Parking	Refer Section 2.
Pedestrian Control	Wire mesh site boundary fencing
Public Transport Services Affected	Nil
Road Occupancy Requirements (if yes, provide further details)	Anticipated to be N. Roads within the Enfield ILC are considered as private roads.
Lane or Footpath Closures (if yes, provide further details)	N
Impacts on Public Roads / Verges / Footpaths	N
Impacts on existing public transport	N
Traffic Control Plan	To be provided as and when required for specific works

4.2.2 Truck Movements

On regional Roads – Outside Enfield ILC

Construction trucks accessing the Precinct E should have regard for the Overarching Operational Traffic Management Plan (OTMP) prepared by NSW Ports (refer to **Figure 9**).

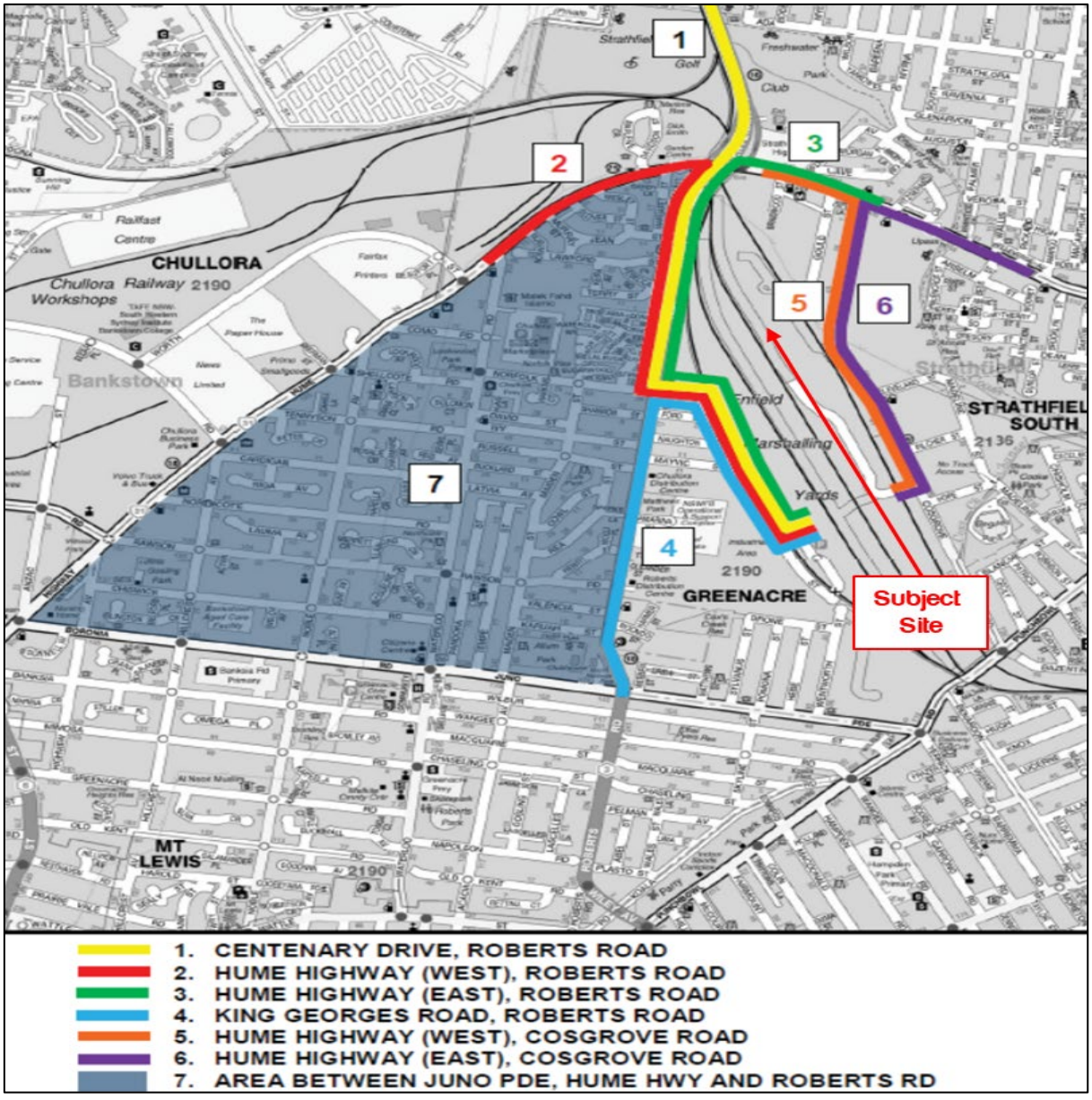

Figure 9: Off-Peak Truck Route Plan - Prepared for Enfield ILC[1]

[1] Extracted from Overarching OTMP prepared by NSW Ports (February 2018)

Furthermore, having regard for rule number 6 of the site-specific conditions proposed by the Overarching OTMP the Articulated Vehicles entering and exiting the Enfield ILC via Cosgrove Road during the morning and afternoon peak hour periods should be discouraged by the Contractors.

Accordingly, the localised access during the morning and afternoon peak hour periods should be as follows and as indicated in **Figure 10**:

- ENTRY from Wentworth Street then via Mainline Road Bridge and through Mainline Road.
- EXIT to Mainline Road and then Mainline Road Bridge and further to Wentworth Street.

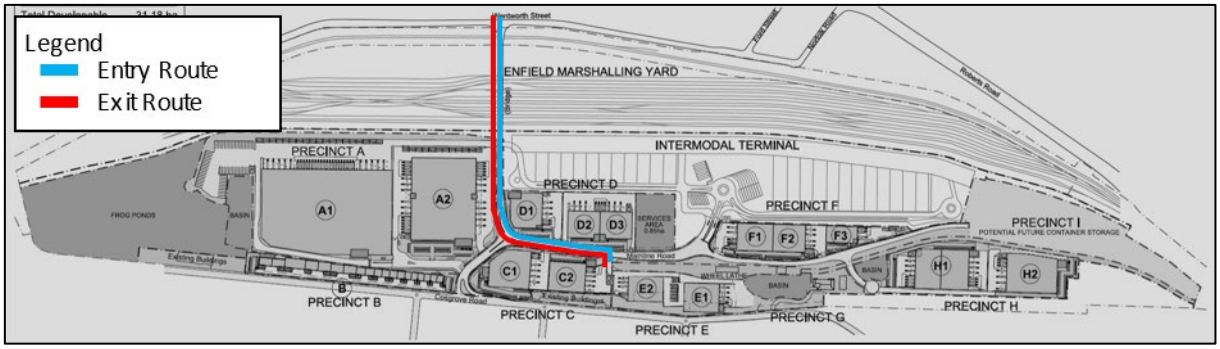

Figure 10: Articulated Vehicle Routes During AM and PM – Precinct E

Within the Enfield Site

All construction vehicle access and egress to/from the Site MUST be in forward direction at all times across the property boundary.

Within the Enfield site, ALL construction trucks must access the precincts, through the specified Gates discussed in Section 2.4.

5 Drivers Code of Conduct

5.1 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 specified routes

5.2 Code of Conduct

The code of conduct requires that while driving any vehicle for work-related purposes, drivers must comply with all of the following:

- Demonstrate safe driving and road safety activities,
- Abide by traffic and road legislation,
- Follow Site signage and instructions, and
- Drivers must only enter and exit the site via the allocated entry and exit points.

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, and
- Exceeding the speed limit in place on any permanent or temporary roads.

5.3 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 work.
- Ensure they have a current driver licence for the class of vehicle they are driving, and this licence is to be carried.
- 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.
- Regularly check the 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 HV routes. All drivers must obey weight, length and height restrictions imposed by the National Vehicle Regulator, and other Government agencies. HVs shall adhere to the routes outlined in Section 4.
- Be aware that at no time may a tracked vehicle 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.
- 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 any near-hits, crashes and scrapes to their manager, including those that do not result in injury.
- Report infringements to a manager at the earliest opportunity.
- Report vehicle defects to a manager prior to the next vehicle use.
- Follow the authorised site access and egress route
- Follow speed limits as imposed within the estate.

5.4 The Site Team Responsibilities

The Lead 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.
- Daily prestart inspections for all plant and equipment currently on-site.
- All construction plant must be fitted with a flashing light, fire extinguisher and non-tonal reversing alarms (or other safe and silent reversing systems that meet WH&S requirements).
- 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.
- Identify driver training needs and arranging appropriate training or re-training. This may include providing the below:
- Operator 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.

5.5 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.

5.6 Environmental Procedures.

To ensure that no dirt or debris from the construction vehicles is tracked on to the public road network, the following shall be required for all construction vehicles, prior to exiting site:

- Drive over cattle grids – located at the site's access – to vibrate off any loose material attached to construction vehicles.
- If required, a worker may hose off any excess loose material attached to construction vehicles with a high-pressure water system.

Furthermore, all drivers are to ensure that all loads are safely covered and / or restrained whilst driving on the public road network.

6 Transport Impact Assessment

6.1 Capped Construction Traffic Generation

As discussed in Section 4.1.2, the construction works – contemplated by this Plan - shall not exceed the estimated daily traffic generation of the MOD 14.

6.2 Impacts on Surrounding Network

It is also noteworthy that the existing Enfield ILC currently operates with an active intermodal and an existing warehouse (located at Precinct G) with the following estimated daily traffic figures:

- Intermodal 1,122 veh/day; and
- Precinct G Warehouse 146 veh/day.

Accordingly, the existing total daily traffic estimated from the Enfield ILC (without the construction vehicles for Precinct E) is 1,268 veh/day.

As discussed previously, construction traffic will NOT exceed the MOD 14 traffic and therefore the construction traffic will not have material impact on the surrounding road network.

7 Plan Administration

7.1 Monitoring Program

The development of a program to monitor the effectiveness of this CTMP shall be established by the lead contractor. It is not anticipated that the monitoring the processes will have any material cost implications. The following items to consider when developing the processes and tasks involved within monitoring the CTMP.

This CTMP shall be subject to ongoing review and will be updated accordingly. Regular reviews will be undertaken by the NSW Ports in cooperation with the contractors. 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.
- 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 leaving site covered as outlined within this CTMP.

7.2 Communications Strategy

A communications strategy shall be established by the lead contractor. The communications strategy will outline 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. It shall include:

- Erection of signs providing advanced notice of works and any traffic control measures to be implemented.
- Written notices to surrounding landowners (and tenants) likely to be directly affected by the works, prior to commencement.

Ongoing communication is also required so that all stakeholders are kept up to date of works and potential impacts.

Nearby property owners that may be affected by the construction works have been identified in the table below, and therefore shall be included within the communications strategy.

Table 7: Stakeholder Communication List

Relevant Stakeholders	
Government Agencies	▪ Roads and Maritime Services (RMS) ▪ Transport Management Centre (TMC) ▪ Department of Planning and Environment (DPE) ▪ Transport for NSW (TfNSW)
Primary Stakeholder	▪ NSW Ports
Local Government Representatives	▪ Strathfield Municipal Council ▪ Canterbury Bankstown Council
Emergency Services	▪ Police ▪ Fire and Rescue ▪ Ambulance
Other Surrounding Landowners	▪ Goodman Property Services (internal stakeholders)

APPENDIX G

Waste and Recycling Management Plan

global environmental solutions

W&RMP Enfield ILC (inclusive of MOD 14)

Waste & Recycling Management Plan

Report Number 610.17806-R01

12 February 2018

Goodman Property Services (Aust) Pty Ltd

GPO Box 4703

Sydney NSW 2001

Version: v0.5

W&RMP Enfield ILC (inclusive of MOD 14)

Waste & Recycling Management Plan

PREPARED BY:

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APPENDIX

Appendix A MOD 14 SEARs Key Issues (Waste)

1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) was engaged by Goodman Property Services (Client) to prepare a Waste and Recycling Management Plan (W&RMP) in support of a Modification to Approval (MOD 14) to the NSW Department of Planning concerning modifications to the built form and operational aspects of the Enfield Intermodal Logistics Centre (ILC). The major project approval MP05_0147 (the Approval) was issued on 5 September 2007 under Part 3A of the *Environmental Planning & Assessment Act 1979* (the Act) and granted initial development approval to the ILC.

It is understood the Enfield ILC masterplan involves the development of nine Precincts (seven of which are intended for warehouse development) and a modification to operational aspects by extending the warehouse operating hours to 24 hours per day and seven days per week for two of the seven proposed warehouse precincts (Precincts C and E). Furthermore, it is understood the Enfield ILC masterplan involves the demolition of former railway buildings / structures, specifically the demolition of the existing building situated on the proposed Precinct D2 / D3. Further details of the Enfield ILC, MOD 14 and the masterplan are provided in **Section 4**.

This W&RMP applies to waste generated from site preparation works (demolition and excavation), construction and operations of the warehouses located within the proposed Precincts A, B, C, D, E, F and H at Enfield ILC.

This W&RMP has been prepared using architectural drawings provided by the Client. A demolition quantity survey has not been provided for preparation of this W&RMP. SLR has therefore made a number of assumptions regarding the quantities and waste types provided herein associated with demolition works.

Waste management for the site preparation and construction stages is described in **Section 5**. Waste management for the operational stage is described in **Section 6**.

1.1 Site Identification

The Enfield ILC is located within Strathfield South NSW, is within the local government area of Strathfield Council (Council) and comprises real property titles Lots 1 - 23 on DP 1183316. The Enfield ILC is bound by Cosgrove Road to the east, Punchbowl Road to the south, the Port Botany Freight Rail Line to the west and Roberts Road to the north (**Figure 1**).

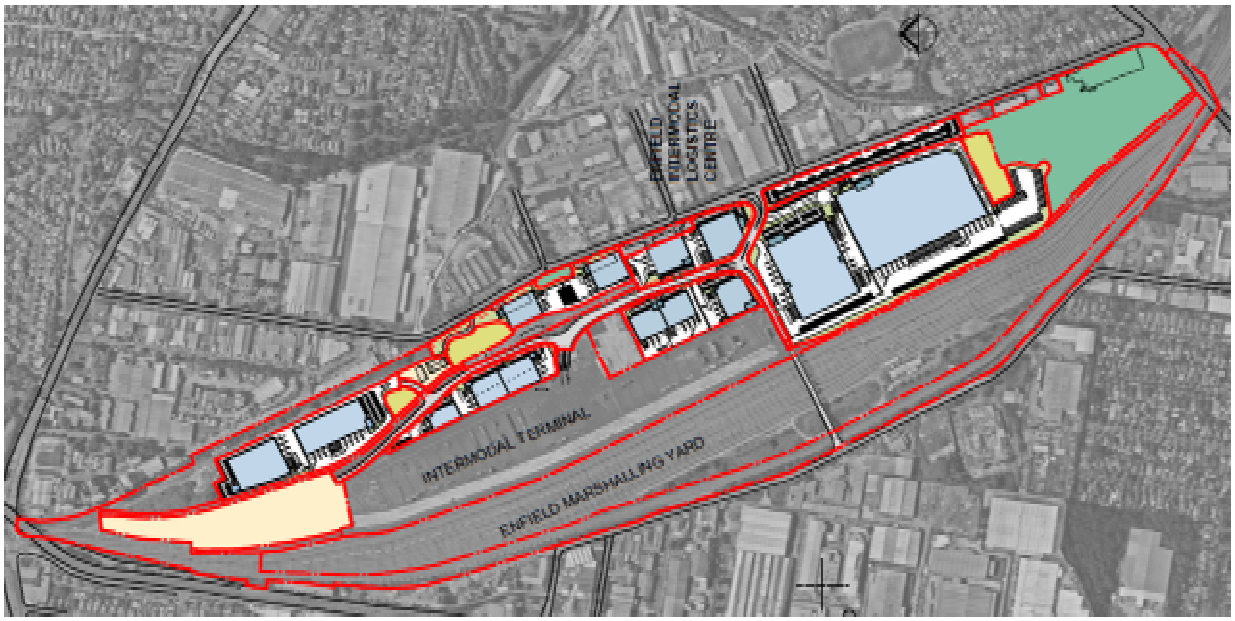


Figure 1 ILC Location & Subdivision Plan[1]

[1] Request for Secretary's Environmental Assessment Requirements MP05_0417 Enfield Intermodal Logistics Centre (MOD 14), URBIS 2017

1.2 Objectives

The Client requires a waste and recycling management plan for Enfield ILC that satisfies the SEARs and is suitable for inclusion into the Modification Report. As such, the objectives of this W&RMP are:

- To address the SEARs Key Issues pertaining to waste for Enfield ILC (refer to **Appendix A**), which are:
  - Assess predicted waste generated from the project during construction and operation, including:
    - Classification of the waste in accordance with the current guidelines;
    - Estimates / details of the quantity of each classification of waste to be generated during the construction of the project, including bulk earthworks and spoil balance;
    - Handling of waste including measures to facilitate segregation and prevent cross contamination;
    - Management of waste including estimated location and volume of stockpiles;
    - Waste minimisation and reuse;
    - Lawful recycling or disposal locations for each type of waste; and
    - Contingencies for the above, including managing unexpected waste volumes.
  - Assess potential environmental impacts from the excavation, handling, storage on site and transport of waste particularly with relation to contamination sediment / leachate control, noise and dust;
- To provide advice on how the classified wastes should be handled, processed and disposed of (or re-used / recycled) in accordance with the above SEARs, Council requirements and better practice waste minimisation principles;
- To assist the Enfield ILC with achieving Federal and State Government waste minimisation targets;
- To facilitate safe and practical collection options of the Enfield ILC for Council collection staff and / or private contractors.

2 BETTER PRACTICE FOR WASTE MANAGEMENT AND RECYCLING

2.1 Waste Management Hierarchy

This W&RMP has been prepared in line with the waste management hierarchy (**Figure 2**), which summarises the objectives of the *Waste Avoidance and Resource Recovery Act 2001*.

The waste management hierarchy comprises the following principles, from most to least preferable (with respect to waste minimisation):

1. Waste **avoidance**, through prevention or reduction of waste generation. Waste avoidance is best achieved through better design and purchasing choices;
2. Waste **reuse**, without substantially changing the form of the waste;
3. Waste **recycling**, through the treatment of waste that is no longer usable in its current form to produce new products;
4. Energy **recovery**, through processing of residual waste materials;
5. Waste **treatment**; and
6. Waste **disposal**, in a manner that causes the least harm to the natural environment.

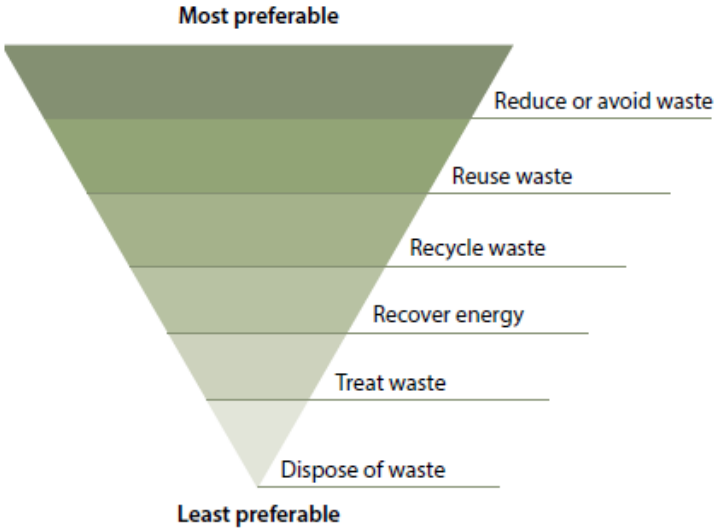


Image from NSW EPA (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*.

Figure 2 Waste management hierarchy

2.2 Benefits of Adopting Better Practice

Adopting better practice principles in waste minimisation offers significant benefits for organisations, stakeholders and the wider community. Benefits from better practice waste minimisation include:

- Enhances social and environmental reputation of an organisation;
- Reduces consumption of non-renewable resources;
- Reduces pollution generated from materials manufacturing and waste treatment;
- Reduces financial burden associated with waste disposal; and
- Provides opportunities for additional revenue streams through beneficial reuse.

2.3 Waste Avoidance, Re-use and Recycling

2.3.1 Waste Avoidance

Waste avoidance measures may include:

- 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 arising;
- Review of packaging design to reduce waste but maintain 'fit for purpose';
- Providing ceramic cups, mugs, crockery and cutlery rather than disposable items;
- Presenting all waste reduction initiatives to staff as part of their induction program; and
- Investigating leased office equipment and machinery rather than purchase and disposal.

2.3.2 Re-use

Establish systems with in-house and supply chain stakeholders to transport products in re-useable packaging where possible.

2.3.3 Recycling

Recycling opportunities include:

- Plastic film (usually in the form of shrink pallet wrap) is light weight and compactable. If kept clean and separated from other plastics it is potentially recyclable and can be used to make items such as outdoor furniture;
- Flatten or bale cardboard to minimise storage space requirements;
- Paper recycling trays provided in office areas for scrap paper collection and recycling;
- Printer toners / ink cartridges are collected in allocated bins for appropriate contractor disposal;
- Development of 'buy recycled' purchasing policy; and
- Providing recycling collections within each of the offices (e.g plastics, cans and glass).

3 WASTE LEGISLATION AND GUIDANCE

Legislation and guidance documents outlined in **Table 1** should be referred to during all stages of the development.

Table 1 Waste legislation and guidance

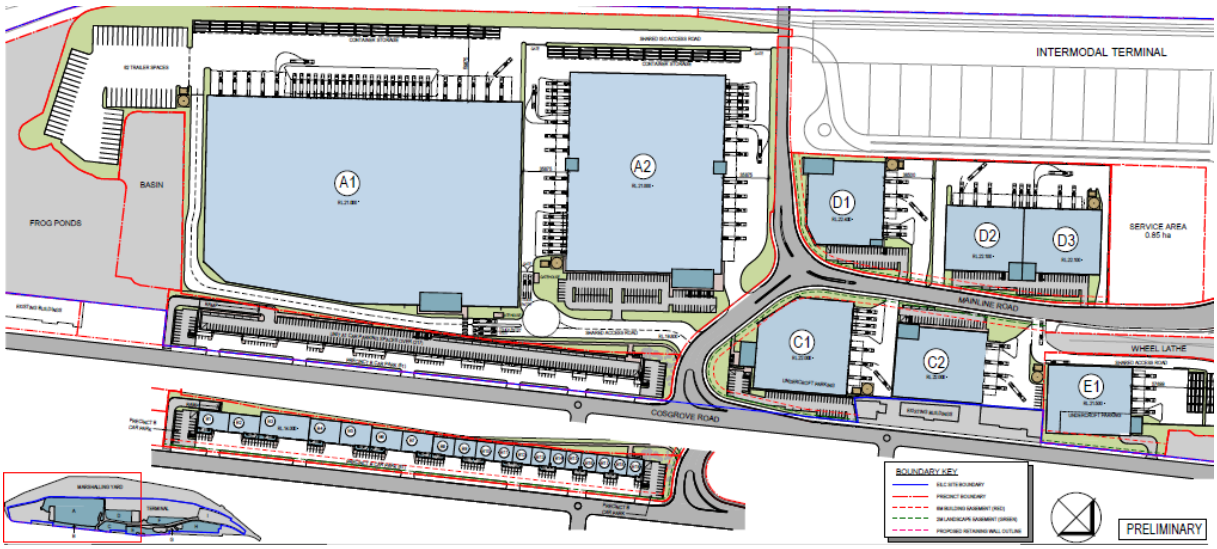
Legislation / Guidance	Objectives
MP 05_0147 MOD 14, Secretary's Environmental Assessment Requirements (SEARs), Planning & Environment 2017	Section 75W of the Environmental Planning and Assessment Act 1979, SEARs pertaining to the Proposed Enfield Intermodal Logistics Centre (MOD) 14 (issued 9 November 2017) pertaining to the site specific planning requirements. This W&RMP specifically addresses the Key Issues pertaining to Waste.
Strathfield Council's Consolidated Development Control Plan (SCDCP) 2005	The Strathfield Council's Consolidated Development Control Plan (SCDCP) 2005 commenced on 3 May 2006 and supports the provisions of the SLEP planning controls by providing detailed planning and design guidelines. Council's SCDCP has been prepared in accordance with section 74C of the Environmental Planning and Assessment Act 1979 and the Environmental Planning and Assessment Regulation 2000. This W&RMP specifically addresses the General Introduction, Part D, H and I of the DCP and sets out the waste management and servicing requirements for industrial buildings proposed to be developed within Council's Local Government Area. The waste management requirements focus on four key features: • **Part 1**: Introduction to the waste legislative and policy context for waste minimisation and management; • **Part 2**: General introduction to a Waste Management Plan (WMP) and its requirements for different types of development (e.g Development Applications, Complying Development Certificates and in some instances, Construction and Occupation Certificate Applications); • **Part 3**: Specific advice for particular uses and scale of development such as multi dwelling housing, residential flat buildings and mixed-use development, commercial and industrial uses; and • **Part 4**: Series of appendices which provide detailed guidance on meeting the relevant development controls for certain types of development. These provide information on calculating waste generation rates, storage and collection area design requirements, Council services and standard notices for display.
Strathfield Local Environmental Plan (SLEP) 2012	The Strathfield Local Environmental Plan (SLEP) 2012 commenced on 29 March 2013, provisions within the SLEP 2012 relate to the conservation of Strathfield's heritage, preservation of trees and vegetation, development within the Strathfield Town Centre and within the Parramatta Road Corridor, and protection of environmentally sensitive areas.
Strathfield Community Strategic Plan 2025	Details Councils and the community's shared long-term vision, priorities and strategies to 2025, ensuring a well maintained local area by: • Clean and attractive town centres and neighbourhoods; • Reduced litter and dumping and taking action on pollution e.g air, noise, water etc; • Well maintained public areas, open spaces and parks; and • Little tolerance for offenders. And a focus on Local environment by: • High quality and well-designed developments; • Sustainable developments; and • Protecting natural environment including air and water quality.
National Waste Policy: Less Waste, More Resources 2009	The National Waste Policy is the current document that provides a guidance framework to all jurisdictions for managing waste through to 2020 and has the following aims; • Avoid the generation of waste, reduce the amount of waste (including hazardous waste) for disposal; • Manage waste as a resource; • Ensure that waste treatment, disposal, recovery and re-use is undertaken in a safe, scientific and environmentally sound manner; and • Contribute to the reduction in greenhouse gas emissions, energy conservation and production, water efficiency and the productivity of the land. The National Waste Policy establishes 6 key areas and identifies 16 strategies across these areas for all government jurisdictions to work towards waste minimisation and resource recovery.

Legislation / Guidance	Objectives
Waste Avoidance and Resource Recovery Act 2001	To promote extended producer responsibility in place of industry waste reduction plans. Specific objectives include: • 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; • Ensuring industry and the community share responsibility in reducing / dealing with waste; and • Efficient funding of waste / resource management planning, programs and service delivery.
Protection of the Environment Operations Act (POEO) 1997 & Amendment Act 2011	Administered by the Environmental Protection Authority (EPA) to enable the Government to establish instruments for setting environmental standards, goals, protocols and guidelines. The owner of a premise, 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. A list of each relevant authority is provided in the POEO Amendment Act and will be noted in the Site's incident register.
POEO (Waste) Regulation 2014 (previously POEO (Waste) Regulation 2005)	Contains provisions relating to the waste levy, waste tracking and management requirements for certain waste types, payment schemes for local councils, consumer packaging recycling and other miscellaneous provisions.
NSW EPA's Waste Classification Guidelines (Part 1) 2014	To assist waste generators to effectively 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 is associated regulations.
Council of Australian Governments National Construction Code 2016	The National Construction Code 2016 sets the minimum requirements for the design, construction and performance of buildings throughout Australia.
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.
NSW EPA (2014) NSW Waste Avoidance and Resource Recovery 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 *Waste Less, Recycle More* funding initiative providing long-term targets for six key result areas including reduced illegal dumping.

4 PROJECT DESCRIPTION

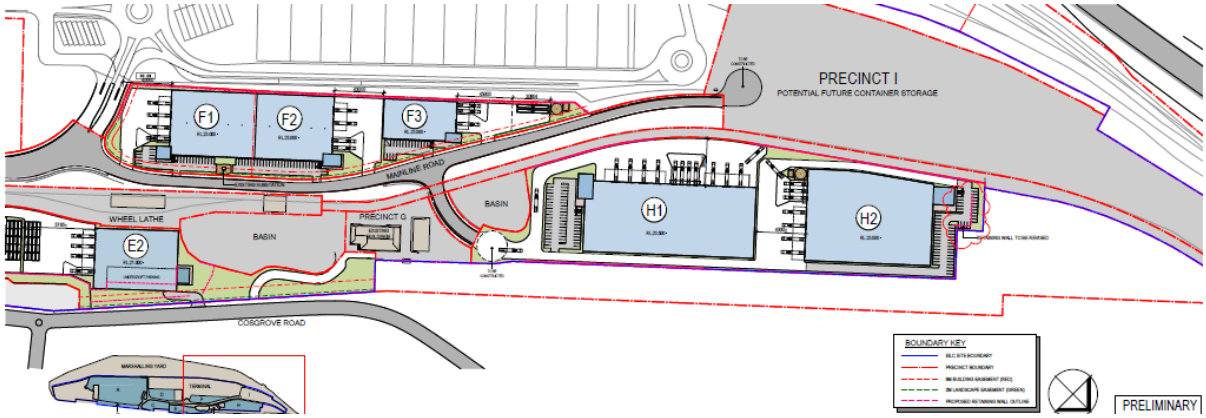
The site is currently occupied by an existing warehouse / office building (which predates the Approval) situated on the proposed Precinct D2 and D3. The proposed work for the Enfield ILC comprises:

- Site preparation (including demolition of an existing warehouse building / structure);
- Bulk earthworks (excavation);
- Construction across Precinct A, B, C, D, E, F and H (as demonstrated in **Figure 3** and **Figure 4**);
- Extension of Precincts C and E operational hours to 24 hours, 7 days a week.



Adapted from Drawing EILC MP03 (P17) dated 22nd December 2017.

Figure 3 Enfield Intermodal Logistics Centre, Precinct A, B, C, D and E.



Adapted from Drawing EILC MP04 (P14) dated 22nd December 2017.

Figure 4 Enfield Intermodal Logistics Centre, Precinct E, F, G, H & I.

5 DEMOLITION AND CONSTRUCTION WASTE AND RECYCLING MANAGEMENT

5.1 Targets for Recycling

The performance of each development should contribute to the following target in accordance with Council's DCP and the NSW EPA (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*:

- 80% of total construction and demolition waste diverted for reuse and recycled (with receipts sufficient in demonstrating the achieved target).

It is anticipated that the waste minimisation measures in the following sections will assist the development to meet this target. Waste reporting and audits are required to determine the actual percentage of wastes that are being / have been recycled during the site preparation and construction stages of the development.

5.2 Key Activities

Key demolition and construction activities at the Site are expected to comprise:

- Demolition of the warehouse within the proposed Precinct D2 and D3;
- Construction of warehouse / office buildings;
- Construction of two gatehouses;
- Construction of an empty container storage area;
- Construction of 807 car parking areas[2] (469 on-ground, 121 undercroft and 217 level one parking atop the B Units);
- Construction of 62 trailer parking areas and
- Construction of 19 awnings and 13 hardstand areas.

5.3 Waste Streams and Classifications

The demolition and construction activities are anticipated to generate the following broad waste streams:

- Site clearance and excavation wastes, including excavated fill, soil and / or rock[3];
- Demolition wastes, including hazardous waste;
- Construction waste;
- Plant maintenance waste;
- Packaging waste;
- Work compound (on-site employees) waste; and
- Wastewater (from dewatering of excavations, plant maintenance and construction activities).

A summary of likely waste types arising from site preparation and construction activities, along with their waste classifications and proposed management methods, is provided in **Table 2.**

[2] Light duty area denotes car parking areas.
[3] SLR has been advised that excavated materials are intended to remain onsite and be used for site leveling and will not be a removed waste.

For further information on how to determine a waste's classification refer to the NSW EPA (2014) *Waste Classification Guidelines*[4]. Further information on managing industrial wastes is also available from the NSW EPA website[5].

Table 2 Potential waste types, classifications and management methods

Waste Types	NSW EPA Waste Classification	Proposed Reuse / Recycling / Disposal Method
Site Preparation		
Fill material	Solid waste (non-putrescible) requiring classification	Reuse on site if possible, off-site recycling or, if required, disposal to landfill
Excavated natural material (ENM)	General solid waste (non-putrescible)	Reuse on site if possible or off-site beneficial re-use
Virgin excavated natural material (VENM)	General solid waste (non-putrescible)	Reuse on site if possible or off-site beneficial re-use
Healthy Trees	General solid waste (non-putrescible) (garden waste)	On / off-site recycling (relocated either on-site or off-site)
Demolition and Construction		
Sediment fencing, geotextile materials (if applicable)	General solid waste (non-putrescible)	Reuse at other sites where possible or disposal to landfill
Concrete	General solid waste (non-putrescible)	Off-site recycling (for filling, levelling or road base)
Bricks and pavers	General solid waste (non-putrescible)	Off-site recycling (cleaned for reuse, rendered over or crushed for landscaping / driveway use)
Gyprock / plasterboard	General solid waste (non-putrescible)	Off-site recycling or returned to supplier
Sand / soil	General solid waste (non-putrescible)	Off-site recycling
Metals (fittings, appliances etc) and bulk electrical cabling	General solid waste (non-putrescible)	Off-site recycling
Timber	General solid waste (non-putrescible)	Off-site recycling (*Treated*: reused for formwork, bridging, blocking, propping or second hand supplier. *Untreated*: reused for floorboards, fencing, furniture, mulched second hand supplier)
Doors, Windows, Fittings	General solid waste (non-putrescible)	Off-site recycling (second hand supplier)
Insulation material	General solid waste (non-putrescible)	Off-site disposal
Glass	General solid waste (non-putrescible)	Off-site recycling (glazing or aggregate for concrete production)
Asbestos	Hazardous waste	Off-site disposal
Fluorescent light fittings / bulbs	Hazardous waste	Off-site recycling or disposal (contact *FluoroCycle* for more information[6])
Lead paint	Hazardous waste	Off-site disposal
Synthetic Rubber (carpet underlay)	General solid waste (non-putrescible)	Off-site recycling (reprocessed and used in safety devices and speed humps)
Carpet	General solid waste (non-putrescible)	Off-site recycling or disposal (reused for landscaping or equestrian uses)
Plant Maintenance		

[4] Available online from http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm
[5] http://www.epa.nsw.gov.au/your-environment/waste/industrial-waste
[6] http://www.fluorocycle.org.au/ or http://www.environment.gov.au/settlements/waste/lamp-mercury.html

Waste Types	NSW EPA Waste Classification	Proposed Reuse / Recycling / Disposal Method
Empty oil and other drums / tins (e.g fuel, chemicals, paints, spill clean ups)	Hazardous waste: Containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid waste (non-putrescible): 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 filters and rags	General solid waste (non-putrescible)	Disposal at landfill
Oil filters	Hazardous waste	Off-site recycling
Batteries	Hazardous waste	Off-site recycling Contact the *Australian Battery Recycling Initiative* for more information[7]
Packaging		
Packaging materials, including wood, plastic (including stretch wrap or LLPE), cardboard and metals	General solid waste (non-putrescible)	Off-site recycling
Wooden or plastic crates / pallets	General solid waste (non-putrescible)	Reused for similar projects, returned to suppliers, or off-site recycling. Contact *Business Recycling* for more information[8]
Work Compound and Associated Offices		
Food Waste	General solid (putrescible) waste	Donate (if suitable)[9] or compost on site. Alternatively dispose to landfill with general garbage
Recyclable beverage containers (glass and plastic bottles, aluminium cans), tin cans	General solid waste (non-putrescible)	Co-mingled recycling at off-site licensed facility or at a local NSW container deposit scheme "Return and Earn" off-site licensed facility[10]
Clean paper and cardboard	General solid waste (non-putrescible)	Paper and cardboard recycling at off-site licensed facility
General domestic waste generated by workers (soiled paper and cardboard, food stuffs, polystyrene)	General solid waste (non-putrescible) mixed with putrescible waste	Disposal at landfill
Wastewater, pump-out waste and septage (sewage)	Liquid (trade) waste	Off-site disposal at licensed facility or disposal direct to sewer where arranged with Council

5.4 Site Preparation Waste Types and Quantities

Site preparation waste would be primarily excavated fill, soil and / or rock. In the absence of Council published sources, the estimated quantities of site preparation waste (**Table 3**) are based on:

- Area estimation obtained from the Masterplan architectural drawing EILC MP01 (P12); and
- An assumed, average excavation depth of 500 mm across the extent of the entire site.

In accordance with Council's DCP, care should be taken to minimise site disturbance and limit unnecessary excavation.

Given the site has a history of industrial land-use, there is the potential for excavation works to encounter contaminated materials and / or unexpected finds. The contractor is directed to refer to their relevant Site Management plan(s), including **Sections 5.10** and **5.13** of this Waste Management Plan, for management of contaminated materials and / or unexpected finds.

[7] http://www.batteryrecycling.org.au/home
[8] http://businessrecycling.com.au/search/
[9] http://www.ozharvest.org/, https://www.foodbank.org.au/, https://www.secondbite.org/ or https://www.exodusfoundation.org.au/
[10] http://returnandearn.org.au/

All excavated spoil is to be classified by an appropriately experienced environmental consultant and separated into contaminated materials (if any), uncontaminated fill, ENM or VENM (refer to **Section 5.13** for management of stockpiles). Uncontaminated fill, ENM and VENM should be retained on site and managed appropriately for beneficial re-use. Contaminated material, if any, should be treated on-site if feasible. Disposal of contaminated fill to off-site landfills is to be considered as a last resort.

Table 3 Estimated quantities of site preparation waste

Spoil Type	Area (m^2)	Depth (m)	Density (tonnes / m^3)	Quantity (tonnes)[1]
Fill, ENM or VENM	593,200	0.5	1.9[2]	563,600

1. Tonnage estimates rounded to the nearest 100 tonnes.
2. Low range bulk density of 1.9 tonnes / m^3 for "medium-dense sands and gravels" (Table 6-1-1 from Tomlinson (1986)[11]).

5.5 Demolition Waste Types and Quantities

The absence of detailed floor plans for the existing building on the Site precludes the provision of information on the types and quantities of demolition waste beyond the general information presented below.

Aerial imaging suggests the demolition of the existing building located within the proposed Precinct D2 and D3 is anticipated to generate demolition waste comprising predominantly of the materials listed in **Table 4**.

Table 4 Anticipated types and estimated quantities of demolition waste

		Estimated Waste Material (tonnes)[1]				
	Floor Area (m^2)	Concrete	Bricks	Timber / Gyprock	Steel	Other
"Office" demolition rates[2]	1000	448	205	4	23	18
Building within D2 / D3	**2,350**[3]	**1,100**	**500**	**10**	**60**	**50**

1. Waste estimates have been rounded up to the nearest 100 tonnes or up to the nearest 10 tonnes if less than 100.
2. Tonnes per 1,000 m^2 from Appendix A of *The Hills DCP 2012*, using the "Factory" demolition rates.
3. Floor areas for demolition were estimated by SLR from SixMaps https://maps.six.nsw.gov.au/.

Although the existing Building across the proposed Precinct D2 / D3 appears to be of brick and steel construction, there is a potential for asbestos[12] and / or asbestos containing materials to be present among the waste generated from demolition of the building. As such, it is recommended that a pre-demolition hazardous materials survey be conducted by a qualified professional on the existing building across the proposed Precinct D2 / D3 to identify potential hazardous wastes likely to arise from demolition of these buildings.

SLR also recommends that a demolition quantities survey be conducted by a qualified professional of the building across the proposed Precinct D2 / D3 to provide further information on types and quantities of demolition waste.

5.6 Construction Waste Types and Quantities

In the absence of readily available construction waste generation rates from Council, SLR have adopted the "Office" and "Factory" waste generation rates (**Table 5**) from Appendix A of *The Hills Development Control Plan (DCP) 2012* for estimating the type and quantities of waste generated from construction of the Enfield ILC (**Table 6**).

"Office" rates have been applied to the construction of offices, warehouse offices and gatehouses. "Factory" rates have been applied to the construction of warehouses, awnings and container storages.

[11] Tomlinson M.J. (1986) *Foundation design and construction.* John Wiley & Sons.
[12] Please also refer to the EPA NSW asbestos information below http://www.epa.nsw.gov.au/your-environment/household-building-and-renovation/dealing-with-household-asbestos, http://www.epa.nsw.gov.au/your-environment/waste/tracking-transporting-hazardous-waste/transporting-asbestos-waste-tyres/tracking-asbestos-waste-locate and http://www.epa.nsw.gov.au/your-environment/waste/industrial-waste/asbestos-waste.

In the absence of readily available published information for "Carpark" construction waste generation rates, SLR have developed "Carpark" construction rates based on the "Office" rates (**Table 5**) by:

- Removing timber, bricks and gyprock (as these materials are unlikely to be present in significant quantities in a modern carpark structure); and
- Increasing the rates for concrete, sand / soil, metal and "other", in proportion, to maintain the total assumed tonnage per 1000 m^2 of construction.

"Carpark" rates have been applied to the construction of car parking spaces (i.e. light duty areas), hardstand areas and trailer parking areas.

Table 5 Construction waste generation rates

		Waste Material (tonnes)						
	Floor Area (m^2)	**Timber**	**Concrete**	**Bricks**	**Gyprock**	**Sand / Soil**	**Metal**	**Other**
Office	1,000	5.1	18.8	8.5	8.6	8.8	2.75	5
Factory	1,000	0.25	2.1	1.65	0.45	4.8	0.6	0.5
Carpark	1,000	--	30.6	--	--	14.3	4.5	8.1

Rates for "Factory" and "Office" are from Appendix A of *The Hills DCP 2012*. Rates for "Carpark" have been derived by SLR (see text for derivation description).

Table 6 Anticipated types and estimated quantities of construction waste

		Waste Material (tonnes)						
Precinct - Unit	**Floor Area (m^2)**	**Timber**	**Concrete**	**Bricks**	**Gyprock**	**Sand / Soil**	**Metal**	**Other**
A1	73,725	45	975	110	60	650	185	280
A2	40,675	40	575	70	45	380	125	180
B1 / 2	996	15	15	15	15	15	15	15
B3	916	15	15	15	15	15	15	15
B4 / 5	1,146	15	15	15	15	15	15	15
B6 / 7	1,046	15	15	15	15	15	15	15
B8 / 9	706	15	15	15	15	15	15	15
B10 / 11 / 12 / 13	1,164	15	15	15	15	15	15	15
B14 / 15 / 16 / 17 / 18 / 19	1,410	15	15	15	15	20	15	15
C1	10,959	30	175	35	30	120	55	70
C2	7,673	20	115	25	20	80	35	50
D1	9,110	25	170	30	25	105	45	65
D2 / 3	14,885	35	260	45	35	175	70	95
E1	7,835	20	140	25	20	90	45	50
E2	7,865	20	150	25	20	95	45	55
F1 / 2	13,776	40	230	50	40	155	70	95
F3	4,591	25	85	25	25	60	40	40
H1	16,807	25	270	35	25	170	65	90
H2	13,771	25	205	35	25	140	50	75
Total	**228,824**	**455**	**3,455**	**615**	**475**	**2,330**	**935**	**1,250**

Floor areas from architectural drawings *17169_GM Enfield_EILC A DA10_P8, 17169_GM Enfield_EILC C DA10_P7, 17169_GM Enfield_EILC D DA10_P5, 17169_GM Enfield_EILC E DA11_P7, 17169_GM Enfield_EILC F DA11_P8 and 17169_GM Enfield_EILC H DA11_P5.* Waste estimates have been rounded up to the nearest 5 tonnes.

5.7 Waste Avoidance

The **Building Designer** is to consider:

- Using prefabricated components and recycled materials (e.g recycled steel);
- Reducing the use of PVC;
- Preferentially using paints, floor coverings and adhesives with low VOC (volatile organic compound) content;
- Using low formaldehyde wood products, post-consumer reused timber and / or Forest Stewardship Council (FSC) certified timber;
- Using fittings and furnishings that have been recycled, are made from or incorporate recycled materials and have been certified as sustainable or environmentally friendly by a recognised third party certification scheme; and
- Preferentially using building materials, fittings and furnishings (including structural framing, roofing and façade cladding) that have longer life and better re-use and / or recycling potential.

The **Site Manager** is to consider:

- Arrange delivery of materials “as needed” to mitigate material degradation by weathering or moisture damage;
- Sort and segregate site preparation and construction wastes to ensure efficient recycling of wastes (see also **Section 5.9.1**);
- Store wastes on site appropriately to prevent cross-contamination and / or mixing of different waste types (see also **Sections 5.9.1** and **5.9.2**);
- Reduce packaging waste 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.

The **Building Contractor / Construction Environmental Manager** (or equivalent) is to consider:

- Apply practical building designs and construction techniques;
- Estimate required volumes of materials to reduce over-purchasing (and excess materials);
- Exercise a preference for long lifespan and / or high potential for re-use in selecting construction materials;
- Re-use formwork where appropriate; and
- Ensure subcontractors are informed of and implement site waste management procedures.

5.8 Re-use, Recycling and Disposal

The building contractor is to (where feasible) implement the following with respect to re-use, recycling and disposal of site preparation and construction waste:

- Provide separate waste bins for recyclable and non-recyclable general wastes;
- Assess excavation spoil for contamination status and beneficial re-use;
- Recycle / dispose of waste oil in an appropriate manner;
- Retain roofing material cut-offs for re-use;

- Retain used crates for storage purposes unless damaged;
- Recycle cardboard, glass and metal wastes;
- Return packaging to suppliers where possible / practicable;
- Recycle / dispose of solid waste timber, brick, concrete, tiles, asphalt and rock (where such waste cannot be re-used on site) to an appropriately licenced construction and demolition (C&D) waste recycling facility or an appropriately licenced landfill;
- Dispose of all asbestos, hazardous and / or intractable wastes in accordance with WorkCover NSW and NSW EPA requirements; and
- Deliver batteries to drop off-site recycling facility / centre.

5.9 Waste Segregation, Storage and Servicing

5.9.1 Waste Segregation and Storage

Waste materials produced from site preparation and construction activities are to be segregated and stored separately on site. Waste and recycling storage areas should be selected having considered its slope, drainage and location relative to waterways / stormwater outlets / vegetation.

It is anticipated that the site will provide allowances for separate storage (e.g separate skip bins and / or appropriately managed stockpiles) of the following waste types:

- Bricks, roof tiles, concrete and scrap metal;
- Metal / steel (if any, in a condition suitable for recycling at metal recycling facilities);
- Timber;
- Glass;
- Hardstand rubble;
- Excavation spoil (uncontaminated, if present);
- Contaminated excavation spoil (if present);
- Hazardous waste (if present);
- Paper / cardboard;
- Recyclable general waste; and
- Non-recyclable general waste.

If there is insufficient space onsite for full segregation of waste types, the building contractor should consult with waste / recycling collection facilities to confirm which waste types may be co-mingled prior to removal from the site.

5.9.2 Waste Storage Areas

Areas designated for waste storage should:

- Allow unimpeded access by site personnel and waste disposal contractors;
- Employ adequate environmental management controls to prevent off-site migration of waste materials and / or contamination from the waste; and
- Not present hazards to human health or the environment.

5.9.3 Waste Servicing and Transport Off-site

The building contractor is to:

- Arrange for suitable waste collection contractors to remove site preparation and construction waste from site;
- Ensure waste bins are not filled beyond recommended filling levels;
- Ensure that all bins and loads of waste materials leaving site are covered;
- Maintain waste disposal documentation detailing, at a minimum:
    - Descriptions and estimated amounts of all waste materials removed from site;
    - Details of the waste / recycling collection contractor(s) and facilities receiving the waste / recyclables;
    - Records of waste / recycling collection vehicle movements (e.g date and time of loads removed, licence plate of collection vehicles, tip dockets from receiving facility); and
    - Waste classification documentation for materials disposed to off-site recycling or landfill facilities.
- Ensure lawful waste disposal records are readily accessible for inspection by regulatory authorities such as Council, WorkCover NSW or NSW EPA;
- Remove waste during hours approved by Council.

5.10 Contaminated / Hazardous Waste

Contaminated fill material and / or soils should be assessed by an appropriately qualified and experienced environmental consultant for remediation and / or management options. Preference is to be given to on-site remediation options to render the material suitable for beneficial re-use. Where on-site remediation is unfeasible, options for on-site management (including encapsulation) are to be assessed.

Off-site disposal of contaminated fill materials and / or soils is to be considered as a last resort and may only be carried out if it is demonstrated that all other on-site remediation and management options are unfeasible.

Where unexpected materials are encountered which are, or are suspected of being, contaminated or hazardous, the following shall be undertaken as a minimum:

- Work in the vicinity of the suspect material is to stop immediately and access to the area restricted;
- Site manager is to contact a qualified hazardous materials assessor and / or environmental consultant (as necessary) to arrange an assessment of the suspect material and advise on subsequent management procedures; and
- The building contractor's unexpected finds protocol, if available, shall be implemented.

It is anticipated that management of contaminated / hazardous waste will also be subject to relevant requirements as set out in the Construction Environmental Management Plan (to be prepared by the building contractor). It is anticipated that management of contaminated / hazardous waste (including asbestos special waste) will also be subject to relevant requirements as set out in the relevant Site Management Plan(s) (to be prepared by the building contractor).

5.11 Liquid Waste Management

Wastewater or liquid waste generated from site preparation or construction activities is not permitted to enter the stormwater system or migrate off-site.

Areas, if any, designated on site for wash-down of equipment plant or machinery are to be appropriately bunded and isolated from the local stormwater system and groundwater.

Liquid waste / wastewater are to be removed by a suitably qualified liquid waste contractor and transported to an appropriately licenced facility for treatment and / or disposal in accordance with NSW EPA regulations. Alternatively, liquid waste may be discharged to sewer under a Trade Waste Agreement with Sydney Water Corporation

Refer also to the building contractor's Soil and Erosion Management Plan and the Construction Environmental Management Plan for further site-specific details on wastewater and liquid waste management, treatment and / or disposal.

5.12 Spills Management

Spillages are to be contained immediately (if safe to do so) and the site manager notified as soon as possible.

Spill containment kits and spill control equipment are to be provided and maintained in sufficient numbers and at appropriate locations to allow ready and rapid access by site personnel. Safety Data Sheets (SDSs) should also be available to provide advice on spill clean-up and disposal.

Refer also to the building contractor's Construction Environmental Management Plan for further site-specific details on spills management.

5.13 Additional Environmental Controls

Site preparation for, and construction of, Enfield ILC infrastructures will likely require excavation into existing ground which may contain contaminated fill materials. In addition to the environmental controls mentioned in this W&RMP, the following control measures should be implemented by the construction contractor during site establishment, site preparation and construction works:

- Work area(s) to be securely fenced using temporary fencing and access restricted to authorised persons;
- Appropriate work site signage to be erected. Signage is to conform with Australian Standard AS13191994 Safety Signs for the Occupational Environment;
- Silt fencing, drain protection, hay bales, diversion drains and other runoff controls installed as appropriate to prevent uncontrolled off-site discharge of surface water and / or runoff;
- Dust suppression equipment (e.g water cart) is to be available at all times and used when appropriate to minimise dust emissions;
- Transport vehicles and cars are to remain on designated haul roads while on site and keep within the site speed limit;
- A wheel wash is to be installed at each site exit. All vehicles must travel through a wheel wash immediately prior to leaving site;
- Any excess excavation spoil intended for disposal off-site must be waste classified in accordance with the NSW DECCW (2009) *Waste Classification Guidelines* prior to disposal;
- All loads in vehicles leaving the site are to be adequately and securely covered prior to leaving site;
- Should visible debris of asbestos containing materials (or materials suspected of containing asbestos) be encountered, work should cease immediately and the procedure for Contaminated / Hazardous Waste followed (see above);
- Should suspect material be encountered, the Unexpected Finds Protocol should be followed (see below);
- Should on-site stockpiling of excavated soils or fill material be required (as a contingency):
    - Stockpiles are to be placed within a securely fenced area;
    - Stockpiles should be located on hardstand where possible. If hardstand areas are not available for stockpiling, stockpiles should be placed on heavy duty plastic sheeting;

- Stockpiles of fill material must be separated from stockpiles of natural soil / bedrock;
- Contaminated material must be stockpiled separately from uncontaminated material;
- Stockpiles are to be compacted and battered;
- The height of individual stockpiles is not to exceed 4 m;
- Sediment controls must be placed around each area containing stockpiles of a certain type (e.g stockpiles of contaminated material, stockpiles of uncontaminated material) such that:
    - No runoff from any other part of the site reaches the stockpiled material;
    - No uncontrolled runoff from stockpiles reaches any other part of the site; and
    - No uncontrolled runoff from any stockpile area reaches another stockpile area.
- Except when being worked on, stockpiles are to be adequately and appropriately covered to minimise the potential for wind erosion, infiltration of rainwater and generation of runoff.

5.13.1 Unexpected Finds Protocol

Should unexpected finds be encountered during excavation or other earthworks, work should stop in all appropriate areas and the site supervisor / foreman notified.

Work should not resume within the affected area until the unexpected finds have been appropriately assessed and any risks presented by the finds have been appropriately mitigated.

Typical unexpected finds include (but are not limited to):

- Fill or soils with visible contamination (e.g oily stains, unnatural discolouration) and / or are strongly malodorous;
- Uncontained liquids;
- Storage drums (e.g liquid storage drums);
- Buried services and infrastructure (e.g underground fuel storage tanks);
- Items of potential or actual Indigenous Heritage or archaeological significance.

Refer also to **Section 5.10**.

5.13.2 Construction Environmental Management Plan

In addition to this W&RMP, it is expected that the construction contractor shall prepare a Construction Environmental Management Plan (CEMP) detailing control measures and procedures to be followed during site preparation and construction work to mitigate the environmental impact of these works. The CEMP and this W&RMP are anticipated to be implemented in tandem during site preparation and construction works.

5.14 Signage

Standard signage is to be posted in all waste storage / collection areas to inform and educate users of waste storage / collection areas while promoting waste minimisation and resource recovery.

Signage must be located to ensure visibility and well-lit at all times. All waste containers / areas are required to be labelled correctly and clearly to identify stored materials. Bin lid stickers must be affixed to each bin, advising of the bin waste type.

Signs approved by the NSW EPA for labelling of waste materials are available online (http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm) and should be used where applicable. A selection of signs prepared by NSW EPA is provided in **Figure 5**.

Figure 5 Examples of NSW EPA labels for waste skips / bins

Signage design should also be consistent with Council's requirements, inclusive of multi-lingual provision. To confirm correct signage, contact Council directly (as required).

5.15 Site Inductions

Waste management measures and procedures are to be included in the site induction for all personnel working at the site. With respect to waste management, the site induction is to include, at a minimum:

- An outline of this W&RMP and all Site Management Plans relating to management of contaminated (and potentially contaminated) materials;
- Legal obligations;
- Emergency response procedures on site;
- Waste storage locations and separation of waste;
- Litter management in transit and on site;
- Implications of poor waste management practices;
- Correct use of spill kits; and
- Responsibility and reporting (including identification of personnel responsible for onsite waste management and individual responsibilities).

5.16 Monitoring and Reporting

Records of volumes or tonnages of waste re-used, recycled or disposed to landfill are to be maintained by the building contractor. Additionally, dockets / receipts verifying recycling and / or disposal in accordance with the W&RMP must be retained and presented to the regulatory authorities such as Council, WorkCover NSW or NSW EPA if requested.

Daily visual inspections of waste storage areas will be undertaken by site personnel to identify and rectify any issues concerning waste management at the site, as well as identifying opportunities to improve waste management at the site. A written record of these inspections, which will include observations made and the results of any remedial actions taken, is to be undertaken and retained by the building contractor as part of the construction environmental management documentation.

Refer also to the building contractor's Construction Environmental Management Plan for further site-specific details on waste monitoring and reporting requirements.

5.17 Roles and Responsibilities

Suggested roles and responsibilities for waste management at the site are provided in **Table 7**. Where possible, a construction environmental manager should be appointed for the site preparation and construction work.

Table 7 Suggested roles and responsibilities for site preparation and construction waste management

Role	Responsibilities
Site Manager for Principal Contractor	• Ensuring plant and equipment are well maintained; • Ordering only the required amount of materials; • Developing or identifying, and using, local commercial opportunities for re-use of materials where re-use on-site is impractical; • Keeping materials segregated to maximise reuse and recycling; • Ensuring that waste sorting and storage areas are sign posted correctly, maintained in a tidy and functional state and do no present hazards to human health or the environment; • Facilitate waste collection / manage waste collection and waste disposal contractors; • Ensure hazardous / contaminated materials are appropriately managed and disposed; • Ensure site records and documentation is kept and is complete; • Ensuring staff and contractors are aware of site requirements for waste management; • Maintain site environmental controls; • Ensure the CEMP and this W&RMP are implemented; • Liaise with the Principal as required; • Approval of off-site waste disposal locations and checking licensing requirements; • Arranging for the assessment of potentially hazardous and / or contaminated materials and liquid wastes; • Monitor site environmental controls; and • Other required monitoring, inspection and reporting requirements.

6 OPERATIONAL WASTE AND RECYCLING MANAGEMENT

6.1 Targets for Resource Recovery

The waste management performance of each development should contribute to the overall NSW State target for recycling, which is expected to increase from 52% (2010 to 2011) for municipal solid waste and 57% for commercial / industrial waste to 70% (by 2021 to 2022) of the total waste generation per capita (NSW EPA (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*).

6.2 Waste Streams and Classifications

Operations of the Enfield ILC are anticipated to generate the following broad waste streams:

- General waste and commingled recycling;
- Bulk packaging wastes, including polystyrene and cardboard boxes;
- Bulky waste items, such as furniture and e-waste; and
- Stores, plant and general maintenance wastes.

Potential waste types, their associated waste classifications, and management methods are provided in **Table 8**.

Table 8 Potential waste types, classifications and management methods – operational waste

Waste Types	NSW EPA Classification	Proposed Reuse / Recycling / Disposal Method
General		
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	NSW container deposit scheme "Return and Earn"; comingled recycling at off-site licensed facility
Food waste	General solid (putrescible) waste	Donate (if suitable)[13] or compost on site. Alternatively dispose to landfill with general garbage
Cardboard / bulky cardboard boxes	General solid (non-putrescible) waste	Cardboard recycling at off-site licensed facility
Bulky polystyrene	General solid (non-putrescible) waste	Disposal at landfill
Furniture	General solid (non-putrescible) waste	Off-site reuse or disposal to landfill
E-waste, printer toners and ink cartridges	Hazardous waste	Off-site recycling (free disposal box / bags and pickup service exists for printer toners and ink cartridges)
Batteries	Hazardous waste	Off-site recycling (Contact the *Australian Battery Recycling Initiative* for more information[14])
Mobile Phones	Hazardous waste	Off-site recycling (Contact *MobileMuster* for more information)[15]
Maintenance		
Spent smoke detectors[16]	General solid (non-putrescible) waste OR Hazardous waste (some commercial varieties)	Disposal to landfill, or off-site disposal at licensed facility

[13] http://www.ozharvest.org/, https://www.foodbank.org.au/, https://www.secondbite.org/ or https://www.exodusfoundation.org.au/
[14] http://www.batteryrecycling.org.au/home
[15] https://www.mobilemuster.com.au/

Waste Types	NSW EPA Classification	Proposed Reuse / Recycling / Disposal Method
Glass (other than containers)	General solid (non-putrescible) waste	Off-site recycling
Light bulbs / fluorescent tubes	Hazardous waste	Off-site recycling or disposal (contact *FluoroCycle* for more information[17])
Cleaning chemicals, 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. Discharge to sewer likely to be subject to Trade Waste Agreement with Sydney Water.

Source: http://www.epa.nsw.gov.au/wasteregulation/classify-waste.htm

For further information on how to determine a waste's classification, refer to the NSW EPA (2014) *Waste Classification Guidelines.*[18]

6.3 Waste Management Overview

Operational waste management is proposed to comprise:

- General waste is to be initially collected within each tenancy and placed (daily) in 4.5 m^3 (i.e 4,500 L) capacity mobile garbage bins (MGBs) located within on-site waste storage areas;
- The 4.5 m^3 bins storing waste or recyclable materials will be located within an area of hardstand adjacent to a loading dock / drive through (**Figures 6** and **7**) for collection by a private waste contractor; and
- Recyclable materials are recommended to be initially collected and bailed within each tenancy. Bales of recyclable material will be temporarily stored indoors until collection by a private recycling contractor. Immediately prior to collection, the bales are to be transported to the 4.5 m^3 MGB waste collection area (if stored separately), ready for collection.

6.3.1 Precinct A, Unit A1

Part H, Section 2.6.6 of the *Strathfield Consolidated Development Control Plan 2005, Waste Minimisation and Management Plan (2015)*, delineates that Council does not generally support compaction due to the potential bin / equipment damage and overloading of bins / trucks.

Due to the anticipated volume of operational waste and recyclable materials generated from the proposed Precinct A, Unit A1 (**Table 10**), it is recommended that for Unit A1:

- Waste be compacted with at least a 2:1 ratio; or
- Waste and recycling be collected more frequently than once per week.

As the use of compaction facilities is at the discretion of Council, early engagement with Council is recommended to clarify the prospect of compaction utility.

6.3.2 Precinct B, Units B1 to B19

For servicing convenience and safety, it is suggested that Precinct B utilise a single, centralised waste storage area positioned between B6 and B7 (**Figure 6**).

[16] 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

[17] http://www.fluorocycle.org.au/ or http://www.environment.gov.au/settlements/waste/lamp-mercury.html

[18] Available online from http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm

6.3.3 Precinct D

Due to the proximity of Units D2 and D3, a single waste storage and servicing area is recommended for servicing convenience.

6.4 Estimated Quantities of Operational Waste

For the purposes of this assessment, SLR has adopted the general waste and recycling needs per *Offices* (for offices, warehouse offices and gatehouses) and *Showroom* (for warehouses) as presented in Appendix H of Council's *Waste Minimisation and Management Plan* (**Table 9**) to estimate the quantities of operational waste and recycling to be generated from the Enfield ILC (**Table 10**).

Table 9 Operational waste and recycling generation rates

Suite Type	Waste	Recycling
Offices	10L / 100m^2 floor area / day	10L / 100m^2 floor area / day
Showroom	40L / 100m^2 floor area / day	10L / 100m^2 floor area / day

The estimated quantities of operational waste and recycling generated by the Enfield ILC (**Table 10**) are based on:

- The number and type of Precinct Units as presented on the architectural drawings;
- The waste and recyclable material generation rates presented in **Table 9**;
- The use of 4.5 m^3 MGBs for weekly waste storage in the respective unit's waste areas;
- MGB dimensions as per Appendix H of Council's *Waste Minimisation and Management Plan*;
- Once-a-week frequency of garbage and recycling collection; and
- Bales of recycling material typically have a volume of 1 m^3 per bale.

Table 10 Estimated quantity of operational waste and recycling generated weekly

Precinct & Unit	Waste (L)	Recycling (L)	Number of Recycling Bales
A1	81,400	20,900	21
A2	40,400	10,700	11
Precinct A Total	**121,800**	**31,600**	**32**
B1	900	300	< 1
B2	900	300	< 1
B3	1700	500	< 1
B4	1100	400	< 1
B5	1100	400	< 1
B6	1000	400	< 1
B7	1000	400	< 1
B8	600	200	< 1
B9	600	200	< 1
B10	500	200	< 1
B11	500	200	< 1
B12	500	200	< 1
B13	500	200	< 1
B14	500	200	< 1
B15	500	200	< 1
B16	500	200	< 1

Precinct & Unit	Waste (L)	Recycling (L)	Number of Recycling Bales
B17	500	200	< 1
B18	500	200	< 1
B19	500	200	< 1
Precinct B Total	**13,900**	**5,100**	**6**
C1	16,100	4,400	5
C2	11,600	3,200	4
Precinct C Total	**27,700**	**7,600**	**9**
D1	8,200	2,500	3
D2	6,600	1,800	2
D3	6,600	1,800	2
Precinct D Total	**21,400**	**6,100**	**7**
E1	10,400	2,800	3
E2	9,600	2,600	3
Precinct E Total	**20,000**	**5,400**	**6**
F1	7,150	1,950	2
F2	7,150	1,950	2
F3	3,900	1,100	2
Precinct F Total	**18,200**	**5,000**	**6**
H1	16,400	4,400	5
H2	15,400	4,200	5
Precinct H Total	**31,800**	**8,600**	**10**
Total (Precincts A / B / C / D / E / F / H)	**254,800**	**69,400**	**76**

Waste estimates have been rounded up to the nearest 100 tonnes.

6.5 Waste Storage Areas

6.5.1 Waste Storage Size

In accordance with Council's *Waste Minimisation and Management Plan* the waste and recycling area must encompass the capacity to store the volume of operational waste and recycling between collections. The waste storage area must enable provision of sufficient bin storage area so that all waste bins can be collected in a single trip and emptied bins can be adequately manoeuvred.

Per Appendix H of Council's *Waste Minimisation and Management Plan,* 2-wheel, 4-wheel and bulk Mobile Garbage Bins (MGBs) are available for waste and recycling storage. After considerations to the estimated quantities of operational waste and recycling to be generated from each unit within the Enfield ILC (**Table 10**), it is recommended that the 4.5 m^3 bulk MBG be used for efficiency of waste storage and that recycling is baled accordingly.

To allow for ready movement of bins into and out of the bin room(s), a bin / garbage room should provide a floor area of at least 150 % of the total minimum bin GFA. This also allows for provisional contingency in the event of a surplus of waste occurrence.

Bales of recycling material typically result in an area of 1 m^2 per bale but the Storage gross floor area (GFA) would be dependent on how the bales are stored (i.e. vertical verse horizontal) and as such have not been included in the recommended storage GFA.

The dimensions and GFA of a 4.5 m^3 L MGB are:

- Height: 1,570 mm;

- Depth: 1,605 mm;
- Width: 1,805 mm;
- GFA of 2.89 m^2 (rounded to 3 m^2 for the purpose of the calculations listed in **Table 11** and **12**).

6.5.1.1 Precinct A

Without compaction, the proposed Precinct A, Unit A1 would require at least 19 of the 4.5 m^3 capacity bulk bins for adequate storage of their operational wastes (**Table 11**). For efficiency of storage and operations, it is recommended that a waste compactor be utilised within Unit A1 with compaction of at least 2:1, decreasing the number of waste MGBs from 19 to 10 (**Table 12**).

Table 11 Minimum number 4.5 m^3 MGBs required for weekly operational waste storage (if recycling baled) and associated minimum GFA for MGBs (without waste compaction)

Precinct & Unit	Total Number of 4.5 m^3 L MGBs	Min. MGBs GFA (m^2)	Recommended Waste Storage GFA (m^2)
A1	19	57	86
A2	9	27	41
Precinct A Total	**28**	**84**	**127**

Table 12 Minimum number 4.5 m^3 MGBs required for weekly operational waste storage (if recycling baled) and associated minimum GFA for MGBs (with 2:1 waste compaction)

Precinct & Unit	Total Number of 4.5 m^3 L MGBs	Min. MGBs GFA (m^2)	Recommended Waste Storage GFA (m^2)
A1	10	30	45
A2	5	15	23
Precinct A Total	**15**	**45**	**68**

In addition to storage space for MGBs, sufficient allowance is to be provided for storage of recycling bales (see **Table 10** for estimated numbers of bales).

6.5.1.2 Precinct B, Units B1 to B19

With combined waste storage / servicing for Units B1 to B19, the combined waste is anticipated to require a minimum of **three 4.5 m^3 L MGBs for waste** and an additional **one 4.5 m^3 L MGB for non-baled recycling**. Four 4.5 m^3 L MGBs have a minimum GFA of 12 m^2 and a recommended storage GFA of 18 m^2.

Alternatively, if each unit within Precinct B is to store their operational waste and recycling individually, the recommended MGB sizes would range between a combination of 360 L, 600 L and 1,100 L MGBs (**Table 14**). The dimensions and GFA of a 360 L, 600 L and 1,100 L MGB are detailed in **Table 13**.

Table 13 Dimensions and GFA of a 360 L, 600 L and 1,100 L MGB

MGB Size (L)	Height (mm)	Depth (mm)	Width (mm)	GFA (m^2)	Rounded GFA (m^2)
360	1,100	885	600	0.53	1
660	1,250	850	1,370	1.17	1.5
1,100	1,470	1,245	1,370	1.71	2

Rounded GFA used for calculations listed in **Table 13**.

Table 14 Minimum number of MGBs required for weekly operational waste and recycling storage with associated minimum GFA for MGBs

Precinct & Unit	Size of MGBs (L)		Total Number of MGBs		Min. MGBs GFA (m^2)	Recommended Storage GFA (m^2)
	Waste	Recycling	Waste	Recycling		
Combined Precinct B Units Waste & Recycling Storage						
Units B1 to B 19	4,500	4,500	4	2	13	23
Individual Precinct B Units Waste & Recycling Storage						
B1	1,100	360	1	1	3	4.5
B2	1,100	360	1	1	3	4.5
B3	1,100	360	2	1	3	4.5
B4	1,100	360	1	1	3	4.5
B5	1,100	360	1	1	3	4.5
B6	1,100	360	1	1	3	4.5
B7	1,100	360	1	1	3	4.5
B8	660	360	1	1	2.5	3.75
B9	660	360	1	1	2.5	3.75
B10	660	360	1	1	2.5	3.75
B11	660	360	1	1	2.5	3.75
B12	660	360	1	1	2.5	3.75
B13	660	360	1	1	2.5	3.75
B14	660	360	1	1	2.5	3.75
B15	660	360	1	1	2.5	3.75
B16	660	360	1	1	2.5	3.75
B17	660	360	1	1	2.5	3.75
B18	660	360	1	1	2.5	3.75
B19	660	360	1	1	2.5	3.75

6.5.1.3 Precinct C to H

Table 15 indicates the estimated minimum number of 4.5 m^3 MGBs required without waste compaction.

Table 15 Minimum number 4.5 m^3 MGBs required for weekly operational waste storage (if recycling baled) and associated minimum GFA for MGBs (without waste compaction)

Precinct & Unit	Total Number of 4.5 m^3 L MGBs	Min. MGBs GFA (m^2)	Recommended Waste Storage GFA (m^2)
C1	4	12	18
C2	3	9	14
Precinct C Total	**7**	**21**	**32**
D1	2	6	9
D2 / 3	3	9	14
Precinct D Total	**5**	**15**	**23**
E1	3	9	14
E2	3	9	14
Precinct E Total	**6**	**18**	**28**

Precinct & Unit	Total Number of 4.5 m^3 L MGBs	Min. MGBs GFA (m^2)	Recommended Waste Storage GFA (m^2)
F1	2	6	9
F2	2	6	9
F3	5	15	23
Precinct F Total	**9**	**27**	**41**
H1	5	15	23
H2	4	12	18
Precinct H Total	**9**	**27**	**41**
Total (Precincts A / B / C / D / E / F / H)	**36**	**108**	**165**

SLR has assumed a week as comprising seven days for Units in Precinct C and E and a five day week for all other Precincts.

In addition to storage space for MGBs, sufficient allowance is to be provided for storage of recycling bales (see Table 10 for estimated numbers of bales).

6.5.2 Waste Storage Locations

As all waste and recycling collection for the Enfield ILC is anticipated to be at-grade (i.e. not underground), in compliance with Council's DCP, the waste collection points are to be positioned behind the front line and along-side the driveway into the site. Appendix E: *Onsite Waste Collection Guidelines / Checklist* denote that Collection vehicles are to reverse into the driveway, exiting in a forward direction. It is recommended that Council is engaged to clarify if reversing into the driveway is applicable to the Enfield ILC.

Waste storage areas are to be integrated into the overall design of the development and should be situated so that:

- The area minimises adverse impacts with respect dwelling proximity, visibility and emanating odours;
- The area minimises adverse impacts of noise, specifically those arising from waste storage areas equipment, bin movement and collection vehicles;
- The waste collection point is not more than 15 m from the property boundary at the street;
- The area is safe and functional to users and servicing collection staff;
- Servicing can be efficiently conducted, limiting (or preferably avoiding) the need for reversing;
- The refuse storage and collection area and is level and without gradients / steps;
- The path for wheeling bins between storage and collection is step free and not exceeding a gradient of 1:5 (20%);
- Servicing vehicles exit the site in a forward direction; and
- Litter and contamination of the stormwater drainage system is avoided.

Waste storage locations have not been included in this report as they are intended to be determined prior to operations.

6.5.3 Waste Storage Design Considerations

In accordance with Council's DCP, driveway and access routes must be at least 3.6 m wide and vehicle standing areas must be at least 10 m long and 3.6 m wide. Waste and recycling storage areas must be constructed in accordance with the National Construction Code requirements (formally the Building Code of Australia, BCA) and should have the following features:

- Allow sufficient on-site space to store and manoeuvre MGBs;

- Graded in accordance with WorkCover NSW Work Health and Safety requirements allowing ease of MGB movement for emptying / servicing;
- Smooth / durable even surfaced finished floors constructed of concrete at least 75 mm thick or other approved material graded and drained to a Sydney Water Corporation approved drainage fitting. The drainage fitting is to be located within the storage area and have a fine grade drain cover sufficient to prevent coarse pollutants from entering the sewer;
- Hot and cold tap-based water supply with centralised missing values and at least one hose cock;
- Finished / impervious ceilings with rigid smooth faced, non-absorbent, easy to clean material;
- Finished walls, impervious floors and ceilings with light colour;
- Be designed to minimise negative impacts on amenity of buildings in the Development and neighbouring properties, with respect to noise and odours;
- Constructed to prevent vermin;
- Well ventilated by permanent, unobstructed natural direct ventilation (not less than 5% of the floor area) or a mechanical exhaust at a rate of at least 5 L / s per every square metre floor area;
- Furnished with lighting and switches inside and outside of the room;
- Close fitting, self-closing door (openable from within the room);
- Smoke detectors be installed in accordance with Australian Standards and connected to the fire prevention system of the building; and
- The bin storage area is to have adequate signage as appropriate.

If the Enfield ILC intends to affix locking shutters or roller doors for either site or waste collection points, a Council-approved master key is to be made available to Council.

Consideration should also be given to the structural capacity of all driveways so as to accommodate Council's contractor or a private contractor when at capacity. Council vehicles at capacity have a mass of approximately 16 tonnes.

Sufficient space for servicing vehicle access and turning is required and the Australian Standard *AS 2890.2 Parking Facilities: Off-street Commercial Vehicle Facilities for a medium rigid vehicle (MRV)* should be consulted for compliance. At a minimum, Council recommends a:

- 18 m kerb to kerb turning circle (plus additional for vehicle overhang if walls / columns occur);
- 3.6 m height clearance (for entire length of travel);
- 10 m length for vehicle standing area;
- 3.6 m width for vehicle standing area; and
- Maximum ramp gradient of 20% (1V:5H).

SLR recommends a private waste contractor be consulted to ascertain the optimum requirements for waste servicing vehicles for the site.

6.5.4 Recycling Bale Storage Design Considerations

Bales of recyclable material are susceptible to degradation by exposure to the elements and vermin. As such, it is recommended that recycling bales be stored indoors until immediately before they are due for collection by the private contractor. The indoor bale storage areas should:

- Be clean and well-maintained;
- Be of sufficient size to store the required number of bales (see **Table 10**);
- Be sufficiently lighted;
- Have appropriate security measures to prevent theft of bales;
- Be equipped with vermin control measures; and

- Be equipped with a high volume sprinkler system to retard the spread of fire.

The bales themselves should be stored with the following considerations:

- Bales should not be placed directly on the floor or ground. Instead, bales should be placed on storage pallets;
- Bales should be stacked and secured in accordance with relevant Safe Work Australia Codes of Practice, as well as with any other relevant legislation or guidance in preventing bales from presenting a risk of harm to workers;
- Bales should not be stacked too close to sprinkler systems to avoid compromising the effectiveness of the fire suppression system;
- The storage time for bales should be kept to the practical minimum, to minimise degradation of the material in the bales; and
- Bales stored outdoors should be covered with plastic sheeting, or similar, to protect bales from exposure to the elements.

6.5.5 Additional Storage

Considerations should be made for the provision of an additional bulky goods storage area, separately delineated and signposted from operational waste and recycling storage areas. This additional storage area can be utilised for:

- Recyclable electronic goods (e.g batteries, computers, televisions, fluorescent tubes and smoke detectors);
- Reusable, bulky items (e.g crates and pallets) to avoid public placing; and
- Liquid wastes (oils etc). Liquid waste storage areas are to be bunded and drained to a grease trap, in accordance with the requirements of Sydney Water.

Separated storage could be provided by installing heavy-duty, lockable steel storage cages / enclosures within a basement level.

Alternatively, the building manager may consider organising a skip bin to remove separated e-waste as required, or engage a contractor to collect and transport these items for recycling at a NSW EPA licensed facility.

6.6 Waste Separation and Storage

Operational waste from the Development should be separated into at least three streams, comprising:

- Paper and cardboard;
- Other recyclables; and
- General waste.

Separate, dedicated MGBs should be provided in the waste service rooms for collection of recyclables. MGBs should be appropriately colour-coded and labelled to enable users to easily identify which waste is to be placed into which bins.

The Standards Australia *AS 4123.7-2006 (R2017) Mobile waste containers Part 7: Colours, markings, and designation requirements* provides recommendations for designated colours for waste bins depending on the type of waste the bins are to receive. The colours anticipated to apply to operational waste generated by the Development are:

- Blue: Paper and cardboard;
- Yellow: Recyclables (other than paper and cardboard); and
- Red: General Waste.

Each MGB should also be labelled according to the waste they are to receive. Labels approved by the NSW EPA for labelling of waste materials are available online[19] and should be used where applicable. A selection of labels prepared by NSW EPA and anticipated to be applicable to operational waste generated by the Development is provided in **Figure 9**.

Figure 6 Example of labels for MGBs for operational waste

6.7 Communication Strategies

Waste management initiatives and management measures should be clearly communicated to building managers, 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 by the building managers:

- Use consistent signage and colour coding throughout the development;
- Ensure all tenants are informed of correct waste separation and management procedures;
- Provide directional signage to show locations / routes to waste storage areas;
- Clearly label general / comingled waste bins to ensure no cross contamination and to identify the types of waste that may be disposed of in each bin; and
- Educate all employees / contractors conducting work on the property ensuring they adhere to this W&RMP.

[19] http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

Signs approved by the NSW EPA for labelling of bins and waste storage areas are available online (http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm).

6.8 Monitoring and Reporting

Auditing and visual monitoring of bins and bin rooms should be undertaken by the building manager at the following frequencies:

- Weekly, within the first two months of operation to ensure the waste management system is sufficient for the operation; and
- Every six months, to ensure waste is being managed appropriately.

Any deficiencies identified in the waste management system, including (but not limited to) unexpected waste volumes, should is to be rectified by the building manager as soon as practicable.

6.9 Roles and Responsibilities

It is the responsibility of the building manager to implement this W&RMP and a responsibility of all tenants and staff to follow the waste management procedures set out by the W&RMP. A summary of recommended roles and responsibilities is provided in **Table 16**.

Table 16 Suggested roles and responsibilities

Responsible Person	General Tasks
Building Manager	Ensure the W&RMP is implemented throughout the life of the operation.
	Update the W&RMP as needed to ensure the plan remains applicable.
	Undertake liaison with and management of waste and recycling collections by Council and / or contractors.
	Conduct inspections of bins and waste storage / service rooms on a regular basis for condition and cleanliness.
	Organise cleaning and maintenance requirements for all bins and waste storage / service rooms as required.
	Manage any complaints and non-compliances reported through waste audits etc.
	Ensure effective signage, communication and education is provided to alert new tenants, building management staff and visitors about the provisions of this W&RMP.
	Monitor and maintain signage to ensure it remains clean, clear and applicable.
	Ultimately responsible for the management of all waste management equipment, cleaning requirements, waste transfer and collection arrangements.
	Manage unexpected waste volumes to mitigate waste overflow in storage areas.
	Ensure all waste compactors (if applicable) are maintained and operational.
Cleaners / Caretaker	Monitor bins to ensure no overfilling occurs.
	Ensure bins and waste storage / service rooms are kept tidy.
	Transfer waste from units to waste storage / service rooms as required.
	Transfer recycling from units into baler storage / service rooms as required
	Cleaning of bins and waste storage / service rooms per Building Manager direction.
	Maintain / operate compactors, ensuring no overfilling occurs.
Tenants / Employees	Adhere to all waste management directions as given by the Building Manager

Appendix A

MOD 14 SEARS KEY ISSUES (WASTE)

Table 17 lists the relevant sections within the W&RMP that specifically address each of the Waste Key Issues as specified by the NSW Planning & Environment's Secretary's Environmental Assessment Requirements (SEARs) for the Application Number MP05_0147 MOD 14.

Table 17 MOD 14 SEARs key issues pertaining to waste

Key Issue		Section Addressing Key Issue
Assess predicted waste generated from the project during construction and operation, including:		*Please refer to individual sections listed below*
a	Classification of the waste in accordance with the current guidelines.	Sections 5.3 and 6.2
b	Estimates / details of the quantity of each classification of waste to be generated during the construction of the project, including bulk earthworks and spoil balance.	Sections 5.4, 5.5 and 5.6
c	Handling of waste including measures to facilitate segregation and prevent cross contamination.	Sections 5.9, 5.10 and 6.5
d	Management of waste including estimated location and volume of stockpiles.	Sections 5.3, 5.5, 5.6, 5.7 and 6.5
e	Waste minimisation and reuse	Section 2
f	Lawful recycling or disposal locations for each type of waste.	Tables 2 and 8
g	Contingencies for the above, including managing unexpected waste volumes.	Sections 5.3, 6.5.1, 6.8 and 6.9
Assess potential environmental impacts from the excavation, handling, storage on site and transport of waste particularly with relation to sediment / leachate control, noise and dust.		Section 5.3

APPENDIX H

Landscape and Ecological Area Management Plan

Landscape and Ecological Area Management Plan

Enfield Intermodal Logistics Centre – August 2016

NSW Ports

Document Control

Revision	Date	Approved	Details of Revision
Draft 0.1 – 0.3 (Revisions A – J)	19/2/09 – 28/8/11	AECOM	Issue of draft document to Sydney Ports
Draft 0.4	9/7/14		NSW Ports draft
Final v1.0	July 2014	NSW Ports	NSW Ports final as approved by DPE
Final v2.0	August 2016	NSW Ports	First operational review

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Abbreviations

AHD	Australian Height Datum
ARI	Average Recurrence Interval
CEMP	Construction Environmental Management Plan
CLM Act	Contaminated Lands Management Act
CoA	Condition of Approval
CPW	Cumberland Plain Woodland
DPI	Department of Primary Industries
EA	Environmental Assessment
ECS	Empty Container Storage
EROLMP	Mt Enfield Enhancement, Revegetation and On-going Landscape Management Plan
FHCA	Frog Habitat Creation Area
FMP	Frog Management Plan
GGBF	Green and Golden Bell Frog
HIPS	Heritage Interpretation Plan and Strategy
ILC	Intermodal Logistics Centre
IMT	Intermodal Terminal
LEAMP	Landscape and Ecological Area Management Plan
LIC	Light Industrial Commercial
LSW	Landscape Works Specification
OEH	Office of Environment and Heritage
OEMP	Operational Environmental Management Plan
RAP	Remediation Action Plan
RFEF	River-Flat Eucalypt Forest
RL	Reduced Level
SoC	Statement of Commitment
WSUD	Water Sensitive Urban Design

1. Introduction

This Landscape and Ecological Area Management Plan (LEAMP) for the Intermodal Logistics Centre (ILC) at Enfield has been prepared by NSW Ports with input from AECOM. The LEAMP is a component of the overall urban, landscape and frog habitat design and documentation prepared by AECOM for the ILC project. This LEAMP is to be read in conjunction with AECOM's Landscape Drawing Package, which is located in Appendix A and the Plant Schedules which are provided in Appendix B of this document.

Condition of Approval (CoA) 6.3(d) of the Project Approval requires the preparation and implementation of a LEAMP as part of an overall Construction Environment Management Plan (CEMP) required for the project. This LEAMP is intended to cover both the Stage 9 – Southern Ecological Area Construction stage (refer to NSW Ports Staging Report 2014) and the ongoing management of the landscaped areas across the site. The LEAMP details how the site will be landscaped (excluding specific tenanted areas) including how these areas will be maintained. It should be noted that some areas of the site have already been landscaped as part of previous project construction stages and approved under the relevant CEMPs. This LEAMP therefore consolidates the landscape details for the whole site

1.1 Project Description

The project comprises the development of a new Intermodal Logistics Centre (ILC), associated road and rail infrastructure works, services and environmental enhancement works.

The ILC at Enfield will be used for the transfer and storage of container freight to and from Port Botany, packing and unpacking of containers within the proposed warehouses and storage of empty containers for later re-use or for return to the Port.

This LEAMP applies to the ILC at Enfield site, 71-73 Cosgrove Road, Strathfield South, comprising Lot 2 DP1006861, Lot 101 DP1001498 and Lot 14 DP1007302 but excluding landscaping in the Intermodal Terminal area and empty container storage areas and the warehousing and Light Industrial Commercial areas which will be designed and developed by the tenants and operators of these areas in accordance with CoAs 1.8 and 1.11.

The ILC site layout, as approved by the Department of Planning & Environment (DP&E), is shown on Figure 1.

The areas to be landscaped which are covered by this LEAMP are illustrated in Figure 2. Note the Juno Parade brickpit and the Rail Corp Pond shown on Figure 2 are outside the scope of this LEAMP as they are located outside of the ILC site.

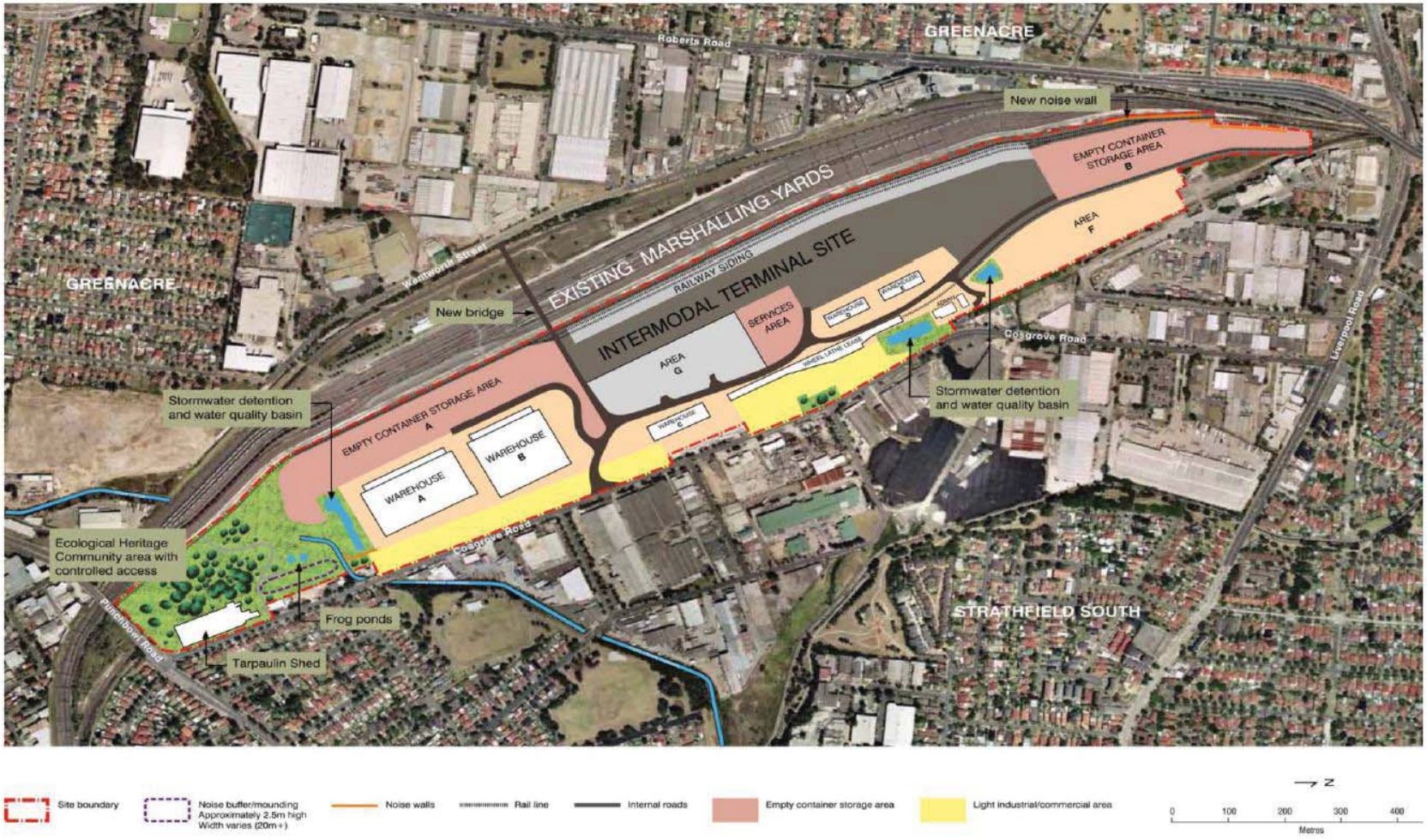

Figure 1 – ILC Site Layout

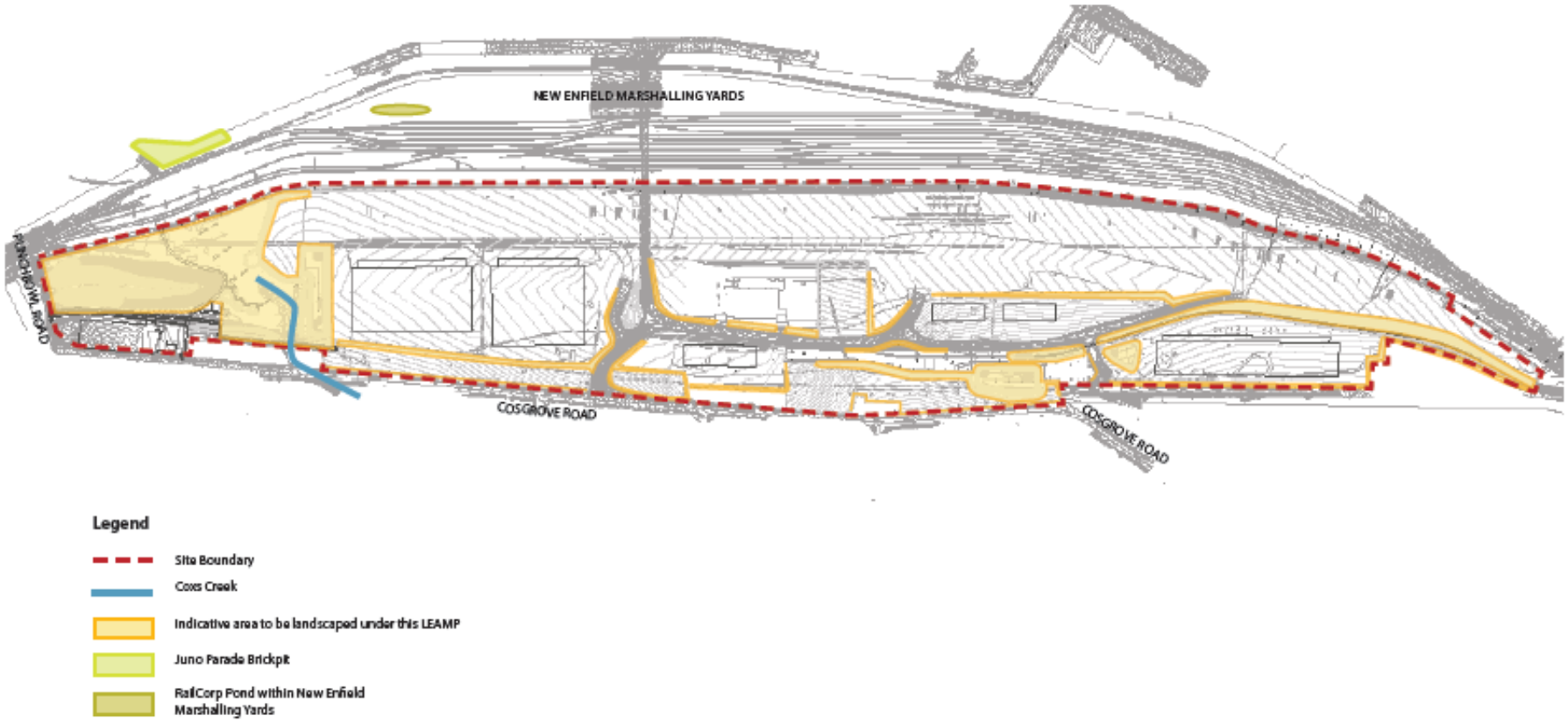

Figure 2 - ILC Site Landscape Areas under this LEAMP

1.2 Approvals Framework

1.2.1 Background

Project approval (MP 05_0147) for the construction of the ILC at Enfield was granted by the Minister for Planning in September 2007 to Sydney Ports Corporation who undertook the original design and early stage construction phases.

NSW Ports became the new land manager of the site on 31 May 2013, as part of a 99 year lease from the New South Wales (NSW) Government. NSW Ports has since completed the main construction phase which included the base infrastructure for the ILC.

1.2.2 Relevant Conditions of Approval (CoA)

Condition of Approval (CoA) 6.3(d) of the Project Approval requires the preparation and implementation of a LEAMP as part of an overall Construction Environment Management Plan (CEMP) required for the project.

This Plan has been developed to address the requirements of CoA 6.3(d) and includes the landscape and ecological area management for Stage 9 construction as well as whole-of-site landscape requirements and the ongoing maintenance to be undertaken by NSW Ports to manage the landscape and ecological areas.

The LEAMP also addresses the relevant requirements of the Statement of Commitments (SoCs) in the Environmental Assessment (EA) for the ILC at Enfield Landscape and Ecological Area Management Plan (SKM, 2005).

Table 1 summarises the relevant requirements and identifies the LEAMP reference where the requirement is addressed.

Table 1: Compliance Requirements

Reference	Requirement	LEAMP Reference
CoA 2.48	The Proponent shall implement all the relevant actions for site recommended in the Management Plan for the Green and Golden Bell Frog Population at Greenacre (OEH, May 2007) being: a). creation of overwintering habitat as part of the two hectare improved forging habitat at the southern end of the site;	Section 3.2.1 Appendix A Appendix C
	b). provision of linkages to the former RailCorp ponds;	Section 3.2.1 Appendix A Appendix C

	c). restrictions on the use of herbicides in known frog habitat and attainment of water quality standards for water discharge from the site.	Section 3.2.2, and 4.3.1 Appendix C
CoA 2.48A	The Proponent shall implement the mitigation measures identified in Section 7.1 of the ILC at Enfield Impact Assessment on Green and Golden Bell Frogs: Addition of Fill Material to Mt Enfield (Biosphere Environmental Consultants Pty Ltd, 2011). These actions shall be incorporated within the CEMP (condition 6.2 of this approval) and the OEMP (condition 6.4 of this approval), as relevant.	Appendix C and refer to NSW Ports OEMP
CoA 6.3(d)	As part of the CEMP for the project, the Proponent shall prepare and implement a LEAMP to detail how the Site is to be landscaped and maintained. The Plan shall be generally consistent with the Landscape Masterplan presented in the document referred to under Condition 1.1 b) of the approval.	Sections 3 and 4 Appendices A and B
	(i) Provision for the use of locally endemic native species for landscaping the site	Section 3 Appendix B
	(ii) Consideration of landscaping locations and densities to maximise visual screening of the project from residential receptors and public open spaces	Section 3 Appendices A and B
	(iii) Measures to maximise the retention of locally endemic native species existing on the site, and removal of weeds and non-indigenous vegetation	Sections 2.3 and 3 Tables in Section 4 Appendix A
	(iv) Measures for the enhancement, revegetation and on-going management of the Ecological Area on the site, including measures to provide suitable habitat for *Litoria aurea*.	Section 3.2.1 Appendices A and C
6.3(f)	A Mt Enfield Stabilisation Management Plan to detail how the batters of Mt Enfield and associated drainage will be managed during construction and until such time as it is stabilised with vegetation. The plan shall include but not be limited to:	Stage 3 CEMP Addendum (2012) – refer to Section 1.2.2 below

	(i) measures to prevent soil erosion and the discharge of sedimentation to lands or waters, including to the Green and Golden Bell Frog Habitat Creation Area and Cox's Creek; (ii) identification of where runoff from Mt Enfield is to be directed to, indicating ponding and flow paths to ensure runoff volume and increased flow velocity has been provided for, with the objective of not exceeding current rates; (iii) measures to mitigate potential dust impacts on sensitive receivers including the Green and Golden Bell Frog Habitat Creation Area and surrounding residences; and (iv) measures for the enhancement, revegetation and on-going landscape management of the Mt Enfield site, undertaken in consultation with Strathfield Municipal Council and Bankstown City Council, and the local community.	
	The ongoing management of drainage structures and landscaping associated with Mt Enfield shall be incorporated into the OEMP required under condition 6.4 of this approval.	This LEAMP (will be appended to the NSW Ports OEMP)
Statement of Commitments (SoC)	A Frog Habitat Area is proposed to be constructed as part of the Community and Ecological area at the southern part of the site. The area will be designed by qualified personnel and will comprise ponds, foraging and shelter habitat.	Works completed in 2011
	Frog movement corridors would also be identified to link the new habitat areas with existing frog habitat areas offsite.	Works completed in 2011
	During site works existing areas of potential frog habitat would be checked and any frogs found removed prior to works commencing. Frog exclusion fences will be provided during construction in areas where there is potential for frog activity.	Incorporated into NSW Ports and tenant CEMPs
	A Landscape Management Plan (LMP) will be prepared during detailed design of the project and implemented	This LEAMP and previous Landscape

	during and after the construction period. The plan would include: processes for the management of the on-site weeds; detail on the rehabilitation of the site with a program of weed removal and revegetation with native species. Noxious weeds at the ILC site would be identified and be removed in accordance to the criteria under the Noxious Weeds Act 1993, and the relevant NSW Department of Primary Industries weed control guidelines; Monitoring of vegetation to ensure it becomes established and to identify any further management requirements. Landscaping to be detailed and carried out in accordance with the concepts in the Landscape Masterplan.	Plans as outlined in Section 1.2.3
	Landscaping and noise mounds would be installed in the early stages of construction to screen the site to a degree appropriate for the location and type of construction activities being carried out. Revegetation of these areas would be conducted as soon as practicable during the construction phases.	Works completed in 2011, including revegetation
	The Frog Habitat Area will be constructed according to the detailed design prepared, and would be managed according to an appropriate Frog Management Plan.	Works completed in 2011
	Monitoring of the Frog Habitat Area will be undertaken to ensure it is functioning as designed.	Appendix C
	Explore opportunities with local community groups for involvement of the community in managed access to the ecological and community area.	Community consultation held on the SEA Concept Plans and through the Community Liaison Group.

1.2.3 Approved Landscape Plans

Condition of Approval (CoA) 6.3(d) of the Project Approval requires the preparation and implementation of a LEAMP as part of an overall Construction Environment Management Plan (CEMP) required for the project. Sydney Ports Corporation's CEMP Framework (2010), indicated that the LEAMP was not required for the Stage 1 Early Construction Works. Subsequent construction stage CEMPs included site specific landscape plans to address the requirements of CoA 6.3(d) as outlined in Table 2. All relevant approved landscape planting plans and on-going maintenance and operational requirements from the plans outlined in the table below have been incorporated into this LEAMP for the Enfield ILC site.

Table 2 - Approved landscape plans to date

Stage	Report	Content	Date
Stage 2	Stage 2 CEMP Addendum	Modified the Stage 2 CEMP (Sept 2010) and associated Flora and Fauna Management Plan to provide landscaping measures and maintenance requirements for the proposed landscaping at the frog ponds, ponds fringing area and the south east earth noise mound (refer to Fig 2).	July 2011
Stage 3 / Modification Application 5	On-site Management of Unsuitable Engineering Fill	Construction plans for Mt Enfield, including landscape drawings.	May 2011
Stage 3 / Modification Application 5	Stage 3 CEMP Addendum – Mt Enfield Enhancement, Revegetation, and On-Going Landscape Management Plan	Incorporates the Mod 5 Plan mentioned above and the Mt Enfield Stabilisation Management Plan required under CoA 6.3(f). Includes construction and operational controls for management of the Southern Ecological Area.	February 2012
N/A	Frog Protection Plan (FPP)	Developed to address CoA 6.3(d) iv) to protect frogs and frog habitat during construction works including landscape recommendations	June 2009
N/A	Frog Management Plan (FMP)	Developed to address CoA 6.3(d) iv) for the on-going management of the frog habitat area including landscape recommendations.	March 2010

1.3 Objectives of the LEAMP

The LEAMP provides an overall management plan for the landscaped and ecological areas within the site during Stage 9 construction and the landscaping details for the site including the ongoing maintenance and management of these areas. The proposed landscaping and ecological activities have been categorised into management areas, as shown in Figure 3.

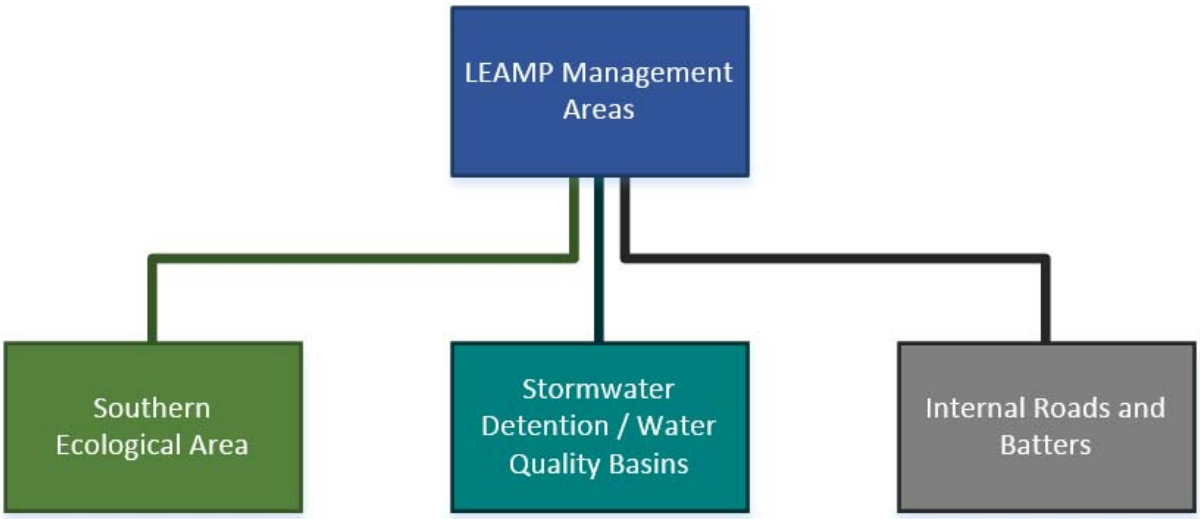

Figure 3 – LEAMP Management Areas

Each management area has specific objectives relating to landscaping and operations as outlined below.

Southern Ecological Area:

- rehabilitation and revegetation of the site with locally endemic native species;
- removal and management of weeds and non-indigenous species;
- stabilisation and maintenance of the integrity of the Mt Enfield landform;
- enhancement, revegetation and on-going monitoring and management of the Green and Golden Bell Frog (GGBF) Habitat Creation Area (FHCA), including provision of habitat ponds and a movement corridor for *Litoria aurea* (Green and Golden Bell Frog);
- provision of public pedestrian access to the Southern Ecological Area for the appreciation of operations, ecological features and heritage items
- vehicle access for operational and maintenance purposes.

Stormwater Detention/Water Quality Basins

- ensure the vegetation used in the basins are suitable and maintained for effective bioretention
- rehabilitation and revegetation of the site with locally endemic native species;
- stabilisation and management of the basin infrastructure
- removal and management of weeds and non-indigenous species.

Internal Roads and Batters:

- removal and management of weeds and non-indigenous species;
- stabilisation and maintenance of the integrity of the batters to prevent erosion. Stabilisation and revegetation of batters with locally endemic native species.

NSW Ports will manage the overall ILC site landscaping and ecological areas in an adaptive manner which will focus on the achievement of these listed objectives.

1.4 Scope of LEAMP

Given landscape plan design details have been previously approved under earlier construction stages, this LEAMP has been drafted to cover the remaining landscaping / construction works which are to be undertaken for the ILC site (i.e. the Southern Ecological Area – Stage 9) while presenting the whole of site landscape plan details. The LEAMP also provides details of the ongoing maintenance and management regime for the landscaped areas. Refer to Section 1.1 for the areas that this LEAMP applies to.

The detailed landscape plans for tenanted areas has not been included in this Plan however, landscaping to be provided within tenanted areas will be outlined in stage specific CEMPs. The ongoing maintenance and management of these landscaped areas will be consistent with this LEAMP.

The preparation of this LEAMP, including selection of landscaping species, species distribution, densities, landscape features and maintenance regimes for the ILC, has been based on:

- the relevant requirements of the Project Approval and the Environmental Assessment (SKM, 2005) (refer Table 1 above);
- security and safety considerations relevant to this type of infrastructure development; and
- design water quality objectives for plants in the bioretention component of the stormwater detention basins.

Major updates to the LEAMP (i.e. changes affecting compliance with the CoA) will be issued to the consent authority for approval before adoption of the revised plan by NSW Ports.

Minor updates (i.e. those which do not impact on compliance with the CoA) will be undertaken by NSW Ports as appropriate.

1.5 Roles and Responsibilities

Table 2 below shows the roles and responsibilities relevant to the LEAMP during construction and operation activities.

Table 3: Roles and Responsibilities

Role	Responsibility
NSW Ports Enfield ILC Site Manager	Overarching project/site manager for the Enfield ILC
NSW Ports Enfield ILC Site Coordinator	Oversight of maintenance regime and application of the LEAMP
NSW Ports Environment Manager	Environmental management of the ILC site
Landscape Contractor (FHCA)	Landscape establishment and maintenance for the frog habitat area
Landscape Contractor (General)	Landscape establishment and maintenance
Herpetologist Consultant – Biosphere Environmental	Advice to NSW Ports and monitoring of GGBF population and habitat
IMT Tenant Environmental Representative	Primary tenant contact in relation to environmental performance of tenant works and operations in the IMT area

2. Site Location and Description

2.1 Site Location and Pre-construction Conditions

The ILC site occupies approximately 60 hectares of land at Enfield and is bounded by Sydney Trains' Enfield Marshalling Yards to the west and by Cosgrove Road to the east. The northern tip of the site is located south of the Hume Highway while the Punchbowl Road overpass demarcates the southern end of the site.

In its undeveloped state, the site is likely to have been vegetated with native species including areas of Cooks River/Castlereagh Ironbark Forest and Cumberland Plain Woodland. Due to its industrial history the site has been largely cleared of any native vegetation. Some small patches of native vegetation exist on the lower slopes of Mt Enfield adjacent to the Tarpaulin Shed.

Prior to the commencement of construction the site was dominated by invasive weed species consisting mostly of exotic grasses with occasional scattered trees and shrubs. A Flora and Fauna study undertaken in 2005 by Biosphere Environmental Consultants (Biosphere) (Appendix G of the EA for the ILC at Enfield (SKM, 2005)) identified weeds such as Castor Oil Plant, Pampas Grass, Crofton Weed, Lantana, Fennel, Fleabane and Cobblers Pegs. Mature street tree planting along the southern end of Cosgrove Road on the adjoining Council road reserve forms a well vegetated edge, although the avenue planting becomes less consistent, with some gaps to the northern section of Cosgrove Road.

2.2 Endangered Species

As outlined by Biosphere (2005), the only endangered species, population or community that has been identified as likely to be present on the ILC site is the Green and Golden Bell Frog (GGBF) *Litoria aurea*. The species was recorded by Greer (pers. comm) in 1995. Frog surveys conducted on the ILC Site in 2001, 2004 and 2008 identified potential habitat areas for GGBF but failed to locate any GGBF on the site.

In 1996, a GGBF pond was created in RailCorp's New Enfield Marshalling Yards, as shown on Figure 1, and frogs have been sighted at this pond. GGBF are also present in the nearby Juno Parade brickpit site (also shown on Figure 1). GGBF are known to be a highly dispersive species and have the capacity to travel across the site under suitable weather conditions.

2.3 Noxious Weeds

Noxious weeds at the site must be identified for removal in accordance with the criteria in the *Noxious Weeds Act 1993* and Strathfield Council's Noxious Weeds Policy (2014). Table 4 provides the noxious weeds list for Strathfield Council.

Table 4 – Strathfield Council Noxious Weeds

Botanical Name	Common Name	Class
Acacia karroo	Karroo Thorn	1
Acetosa sagittata	Turkey Rhubarb	4
Alternanthera philoxeroides	Alligator Weed	3
Ambrosia artemisiifolia	Annual Ragweed	5
Ambrosia confertiflora	Burr Ragweed	5
Amelichloa brachychaeta	Espartillo	5
Andropogon gayanus	Gamba Grass	5
Annona glabra	Pond apple	1
Anredera cordifolia	Madeira Vine	4
Araujia sericifera	Moth Vine	4
Argemone mexicana	Mexican Poppy	5
Arundo donax	Giant Reed/Elephant grass	4
Asparagus species	Asparagus	4
Asystasia gangetica	Chinese Violet	1
Baccharis halimifolia	Groundsel bush	3
Bassia scoparia	Kochia	1
Brassica barrelieri	Smooth-stemmed turnip	5
Broussonetia papyrifera	Paper Mulberry	2
Bryophyllum species	Mother-of-millions	4
Cabomba species	Cabomba	5
Cardiospermum grandiflorum	Balloon Vine	4
Carthamus glaucus	Glaucous star thistle	5
Celtis sinensis	Chinese Celtis	4
Cenchrus biflorus	Gallon's Curse	5

Cenchrus brownii	Fine-bristled burr grass	5
Cenchrus echinatus	Mossman River Grass	5
Centaurea stoebe	Spotted Knapweed	1
Centaurea xmoncktonii	Black knapweed	1
Cestrum parqui	Green Cestrum	3
Chromolaena odorata	Siam weed	1
Chrysanthemoides monilifera	Bitou Bush Boneseed	3 1
Clidemia hirta	Koster's Curse	1
Cortaderia selloana	Pampas Grass	3
Cryptostegia grandiflora	Rubber Vine	1
Cuscuta species	Dodder	5
Cylindropuntia species]	Prickly Pear	4
Cynara cardunculus	Artichoke thistle	5
Cyperus esculentus	Yellow Nutgrass	5
Cytisus scoparius	Scotch Broom	4
Dolichandra unguis-cati	Cat's claw creeper	4
Egeria densa	Dense waterweed	4
Eichhornia azurea	Anchored water hyacinth	1
Eichhornia crassipes	Water hyacinth	2
Equisetum species	Horsetail	1
Festuca gautieri	Bear-skin fescue	5
Gaura parviflora	Clockweed	5
Genista linifolia	Flax-leaf Broom	4
Genista monspessulana	Cape Broom	3
Gleditsia triacanthos	Honey locust	4
Gymnocoronis spilanthoides	Senegal tea plant	1
Harrisia species	Harrisia Cactus	4
Helianthus ciliaris	Texas Blueweed	5
Heteranthera reniformis	Kidneyleaf mud plantain	1
Hieracium species	Hawkweed	1

Hydrocotyl ranunculoides	Water pennywort	1
Hygrophila costata	Hygrophilia	2
Hymenachne amplexicaulis	Hymenachne	2
Hyparrhenia hirta	Coolatai Grass	3
Hypericum performatum	St Johns Wort	4
Ipomoea indica	Morning Glory	4
Lagarosiphon major	Lagarosiphon	1
Lantana camara	Lantana	4
Ligustrum lucidium	Broad-leaved Privet	4
Ligustrum sinense	Narrow-leaf Privet	4
***Limnobium laevigatum*/spongia**	Frogbit/Spongeplant	1
Limnocharis flava]	Yellow Burrhead	1
Ludwigia longifolia	Long-leaf willow primrose	3
Ludwigia peruviana	Ludwigia	3
Lycium ferocissimum	African Boxthorn	4
Miconia species	Miconia	1
Mikania micrantha	Mikania vine	1
Mimosa pigra	Mimosa	1
Myriophyllum spicatum	Eurasian water milfoil	1
Nassella neesiana	Chilean needle grass	4
Nassella tenuissima	Mexican feather grass	1
Nassella trichotoma	Serrated Tussock	4
Ochna serrulata	Ochna	4
Orobanche species	Broomrapes	1
Oryza rufipogon	Red Rice	5
Oxalis articulate	Wood Sorrel	5
Parietaria judaica	Pellitory	4
Parthenium hysterophorus	Parthenium weed	1
Paspalum quadrifarium	Tussock paspalum	4
Pennisetum macrourum	African feathergrass	5
Pennisetum setaceum	Fountain Grass	5

Phyla canescens	Lippia	4
Phyllostachys species	Bamboo	4
Picnomon acarna	Soldier Thistle	5
Pistia stratiotes	Water lettuce	1
Pueraria lobata	Kudzu	2
Ricinus communis	Castor Oil Plant	4
Rubus fructicosus	Blackberry	4
Sagittaria calycina variety calycina	Arrowhead	4
Sagittaria platyphylla	Sagittaria	4
Salix babylonica	Weeping Willow	5
Salix cinerea	Grey Sallow	2
Salix nigra	Black Willow	2
Salvinia molesta	Salvinia	2
Schinus terebinthifolius	Broad-leaf Pepper Tree	2
Scolymus hispanicus	Golden Thistle	5
Senecio madagascariensis	Fireweed	4
Sisymbrium runcinatum	African turnip weed	5
Solanum elaeagnifolium	Silver-leaf Nightshade	4
Solanum viarum	Tropical Soda Apple	1
Sonchus arvensis	Corn sowthistle	5
Stachytarpheta cayennensis	Cayenne Snakeweed	5
Stratiotes aloides	Water Soldier	1
Striga species	Witchweed	1
Tamarix aphylla	Athel Tree	5
Tecoma stans	Yellow bells	4
Toxicodendron succedaneum	Rhus Tree	4
Trapa species	Water Caltrop	1
Ulex europaeus	Gorse	3
Vachellia nilotica	Prickly Acacia	1

Class meanings from the *Noxious Weeds Act 1993*:

- Class 1 – State Controlled Weeds: The plant must be eradicated from the land and the land must be kept free of the plant. The weeds are also "notifiable" and a range of restrictions on their sale and movement exist.
- Class 2 – Regionally Controlled Weeds: The plant must be eradicated from the land and the land must be kept free of the plant. The weeds are also "notifiable" and a range of restrictions on their sale and movement exist.
- Class 3 - Regionally Controlled Weeds: the plant must be fully and continuously suppressed and destroyed.
- Class 4 - Locally Controlled Weeds: the growth and spread of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction.
- Class 5 - Restricted Plants: no requirements to control existing plants of class 5 weeds. However, the weeds are notifiable and a range of restrictions on their sale and movement exist.

2.4 Soils

Results from geotechnical bore log investigations undertaken by Coffey Geotechnics (2009) show that ground conditions on site comprise of shale and/or clay or sandstone topped by a variety of fill materials. The site is generally void of topsoil, however patches of silt topsoil do exist.

Fill materials generally extend to depths of 0.5 - 1 metre, however in some locations fill extends to 3 metres. Fill types range in variety, depending on location, with materials including sand, silty sand, gravel (sandy and clayey) and clay.

Below the fill, ground conditions generally comprise clay and/or shale, and in limited areas, sandstone. Sandstone was found to be consistent in makeup, generally described as fine grained, pale grey, highly to moderately weathered and of medium strength. Shale material types, which were recorded as deep as 10 metres, varied from extremely weathered, very low strength, orange – brown, to medium strength, dark grey and orange – brown, moderately weathered. Clay types were generally found to have high plasticity, red, pale grey, red – brown, yellow and brown.

2.5 Contamination

Historic land uses on the site, combined with the importation of substantial amounts of fill and debris resulted in some residual contamination at the site prior to construction. The findings of site audits undertaken by Dames and Moore (1999) and Environ (2002) are summarised in

the EA (SKM, 2005). A site audit concluded that the subject site was suitable for industrial use, subject to some soil remediation and validation during development.

Remediation works were undertaken at the site during 2009 in accordance with Remediation Action Plans (RAPs) prepared by Sydney Ports' remediation consultant (Coffey Environments, 2009a and 2009b). The RAPs were endorsed in Site Audit Statements prepared in 2009 by an accredited Site Auditor under the *Contaminated Land Management Act 1997* (CLM Act) in accordance with CoA 2.43.

Some contamination has been retained at the site in cells and capped areas. The locations of remaining contamination are shown in NSW Ports' Operational Environmental Management Plan (OEMP). Site management plans (SMPs) have been developed to manage the residual contamination risks by outlining procedures to be followed in the event of intrusive works that may breach soil marker and capping layers.

The following SMPs apply to the Enfield ILC site (refer to Figure 1 for locations).

- IMT Area (Final) v2 22 October 2013
- ECSA A (Final) v2 22 October 2013
- Warehouses A & B, Lot 6 January 2014
- Area D January 2014
- Area E January 2014
- Area F January 2014
- Internal Roads and Basin F (Final) September 2014
- Southern Precinct (draft) February 2016

2.6 Flooding

Three main drainage lines are located beneath the site, including the Coxs Creek canal in the south of the site (shown on Figure 1) and the DELEC Drain and the Central Drain north of Coxs Creek (underground stormwater channels under the site not relevant to landscaping).

During high flow events, stormwater runoff overflows on to the Coxs Creek floodplain. Within the ILC site, the Coxs Creek floodplain extends between Cosgrove Road and RailCorp's Marshalling Yards at the southern end of the site, on the northern side of Mt Enfield. The approximate extent of the floodplain is shown on Figure 7.

2.7 Groundwater

Groundwater investigations (SKM 2005) indicated that a general water table may be present at RL 12 - 13 metres AHD in the southern portion of the site, and at RL 15 - 18 metres AHD in the northern portion. This translates to groundwater depths of between 1 and 5.5m across

the site which may fluctuate seasonally by 1-2m. The site bio-retention basins have been designed to accommodate the existing groundwater conditions.

2.8 Heritage

Heritage items adjacent to the NSW Ports landscaped areas on site include:

- Tarpaulin Factory – NSW Ports, in accordance with the commitment made in the EA (SKM 2005), will undertake further investigations and consultation regarding the future of the Tarpaulin Factory, with a final use determined at a later stage. CoA 2.34 requires that any proposal to destroy, modify, redevelop, relocate or otherwise physically affect the Tarpaulin Factory, except for agreed stabilisation works, shall be the subject of further assessment and approval in accordance with the *Environmental Planning and Assessment Act 1979*.
- Pillar Water Tank – required to be relocated on site and undergo stabilisation works in accordance with CoA 2.35 and CoA 2.36. These works were completed in May 2013.

Recommendations for heritage interpretation on the site are contained in the Heritage Interpretation Plan and Strategy (HIPS) (Conybeare Morrison, 2009) and some components such as train wagon wheels and the DELEC turntable have also been included in the landscape design for the ILC. These items are of historical interest but are not listed heritage items. Figure 5 shows the location of the listed heritage and historical interest items. The HIPS also contains recommendations for the maintenance of the heritage items remaining on the site, which have been incorporated into NSW Ports OEMP.

3. Site Landscaping

3.1 Background

This section of the LEAMP provides details as to how the site is to be landscaped.

Descriptions of the landscaping proposed within each management area are provided in the following sections, along with the identification of key issues that are required to be managed. Actions that will address these key issues are listed in Section 4.

A selection of suitable local endemic species from the Cumberland Plain Woodland community, which is the original native vegetation community of much of western Sydney (Botanic Gardens Trust, 2010), has been incorporated in the landscaping of the site.

Landscaping features and terrestrial and aquatic species suitable for GGBF habitat have been provided in the FHCA contained in Appendix C (in accordance with the Frog Management Plan prepared by NSW Ports' consulting herpetologist in consultation with the OEH). Where possible, existing trees and native species, including local endemic species, such as *Daviesia ulicifolia* and *Acacia parramattensis* on the slopes adjacent to the Tarpaulin Shed, will be retained in the southern part of the site.

Species and features appropriate for the landscaping of an industrial facility are used in batters and road edges within the operational parts of the site.

The proposed landscaping will provide a level of screening of the site for off-site viewers. Except for residential areas to the north-west and the south-east, the site is surrounded by industrial development. Existing views from the north-western and south-eastern residential areas are largely obscured by existing industrial/commercial development or street landscaping. The proposed landscaping will provide some visual screening to the site from public roads and industrial areas.

3.2 Southern Ecological Area

The Southern Ecological Area includes:

- Mt Enfield, including a public access track;
- GGBF Habitat Creation Area;
- Coxs Creek Floodplain.

Figures 4 shows the location and extent of the Southern Ecological Area sub-areas. Figure 5 shows a detailed concept plan of the Southern Ecological Area features.

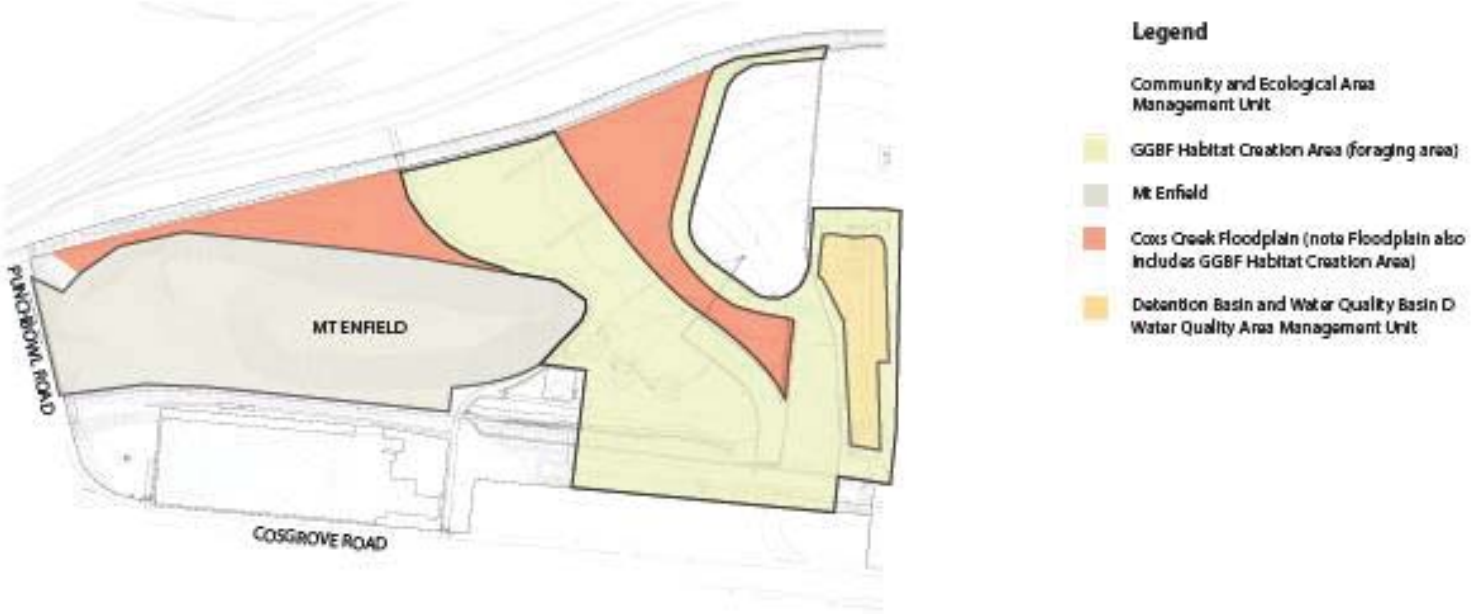

Figure 4 – Approximate location of sub-area management units in the Southern Ecological Area

Figure 5 - Southern Ecological Area Concept Plan

3.2.1 Landscaping Works

Mt Enfield

Mt Enfield is located in the south of the ILC site within the Southern Ecological Area, as shown on Figure 4.

The highest point of Mt Enfield is currently 36.0 m AHD. The level of the footpath on the northern side of Punchbowl Road is approximately 26 m AHD. The area within the ILC site immediately north of Punchbowl Road has been filled to the same level as the footpath for a distance of approximately 10 - 12 m, before rising at a slope of 1V:5H to 35.25 m AHD and then flattening out to the highest point of 36 m AHD. The northern, eastern and western sides of Mt Enfield have a slope of approximately 1V:2H.

Leighton Contractors, under the main construction works phase (Stage 3) prepared and implemented the Mt Enfield Stabilisation Plan to address the requirements of CoA 6.3f (i)-(iii) during construction. This plan is not reproduced as part of this LEAMP.

The Mt Enfield Enhancement, Revegetation and On-going Landscape Management Plan (EROLMP) (Sydney Ports, December 2011), provided details for the landscaping, ongoing management and general enhancement of Mt Enfield and the surrounding area. The relevant provisions from this document have been incorporated into this LEAMP.

The proposed landscaping and revegetation of Mt Enfield as outlined in the Stage 3 CEMP Addendum: Mt Enfield EROLMP was approved by the DP&I in its letter dated 20 March 2012.

The proposed measures were implemented once all unsuitable engineering fill excavated from the ILC site was been relocated on and around Mt Enfield. The Mt Enfield EROLMP was prepared to address the requirements of CoA 6.3f (iv) in consultation with Strathfield Council, who provided advice regarding suitable species for the revegetation of Mt Enfield.

Where available, topsoil from the site has been used at the reshaped Mt Enfield. Currently, hydro-mulching has been undertaken as a method of initial stabilisation. An EcoBlanket Layer has been applied to the parts of Mt Enfield that were disturbed by fill placement to stabilise the soil and maintain the integrity of the slope. The specifications for the application and on-going management of the EcoBlanket are provided in Appendix E. Additional soil requirements such as maintenance of the topsoil and mulching for new plantings will be addressed by the landscape contractor.

Where possible, native plants on the lower slopes of Mt Enfield including *Daviesia ulicifolia* and *Acacia parramattensis* will be retained.

In accordance with the requirements of CoA 6.3 d), the reshaped Mt Enfield will be landscaped with indigenous native species in accordance with Drawings MA-MD-LU-GE-900201 and MA-

MD-LU-GE-900202 (Appendix A) and the plant schedules provided in Appendix B. The plants have been adopted as being suitable to the conditions and slopes expected on the reconfigured Mt Enfield. The plant communities used to revegetate Mt Enfield will comprise native species mostly from the locally occurring Cumberland Plains Woodland including:

- Sheoak Forest *Casuarina littoralis* (SF-CL);
- Sheoak Forest *Allocasuarina torulosa* (SF-AT),
- Sheoak Forest *Casuarina glauca* (SF-CG);
- Native Slope Mix (NSM);
- Native Slope and Tree Mix (NSTM); and
- Native Grass Mix (NGM).

In addition, native *Eucalyptus tereticornis* (Forest Red Gums) have been planted along the Punchbowl Road site boundary to the south of Mt Enfield to provide additional vegetative screening for the Southern Ecological Area. The forest red gum is one of the key canopy species of the threatened Cumberland Plain Woodlands.

The proposed revegetation plan will improve the long term ecological conditions of the area. Existing noxious weed infestation will be substantially reduced through a sequential program of weed removal, mulching and planting which will minimise the exposure of Mt Enfield slopes to erosion potential. This will ensure the slopes remain vegetated enough to stabilise the soil and maintain the slope gradients.

Mt Enfield contains contaminated spoil material from the Enfield ILC site. A 100mm layer of clean fill has been placed over the contaminated material. A draft Site Management Plan (SMP) has been prepared for the Southern Precinct, including Mt Enfield, to minimise exposure to contamination on site. The SMP (including the final version once available) will apply to any works that involve excavations or any landscaping maintenance that has the potential to disturb the clean fill layer. The SMP has been developed to cover landscaping works and maintenance, management of the FHCA and to allow public access along the track provided at Mt Enfield. NSW Ports' landscape contractors will be provided with a copy of the SMP and will be required to comply with its provisions.

Controlled public access will be provided to Mt Enfield as demonstrated in Figure 5. The entrance to the public access track will be provided from Punchbowl Road via a self-closing gate. Visitors will be confined to a single access track that follows the ridge line to the top of Mt Enfield and includes a number of viewing points. Fencing and vegetation barriers will be in place to ensure visitors remain on the designated pathway. Public access to the area will be restricted to daylight hours only, with the gate locked after dark.

Ongoing landscaping management and maintenance requirements for Mt Enfield are addressed in Section 4.

Green and Golden Bell Frog Habitat Creation Area

The GGBF Habitat Creation Area has been designed in accordance with recommendations of NSW Ports' consulting herpetologist, Dr Arthur White of Biosphere Environmental Consulting. As required by CoA 2.48, these recommendations also incorporate the requirements outlined in the Management Plan for the Green and Golden Bell Frog Key Population at Greenacre (OEH 2005).

The elements that make up the two hectares of frog foraging habitat required under CoA 2.48 include a number of Precincts which fall within both the FHCA and the Coxs Creek Floodplain sub-areas, as shown on Figure 6 below:

- frog foraging area (Precinct 4)
- frog movement corridor (Precinct 5)
- frog pond precinct (Precinct 6);
- Cumberland Plains Woodland area, including south-east noise mound (Precinct 8).

Precincts 4, 5 and 6 are part of the Cox's Creek Floodplain area.

The location of the landscape vegetation communities recommended for this sub-area are provided on drawings MA-MD-LU-GE-900201 and 900202 in Appendix A. The drawings in Appendix A also show the layout of the FHCA. Species to be provided for these communities are provided in the plant schedules in Appendix B.

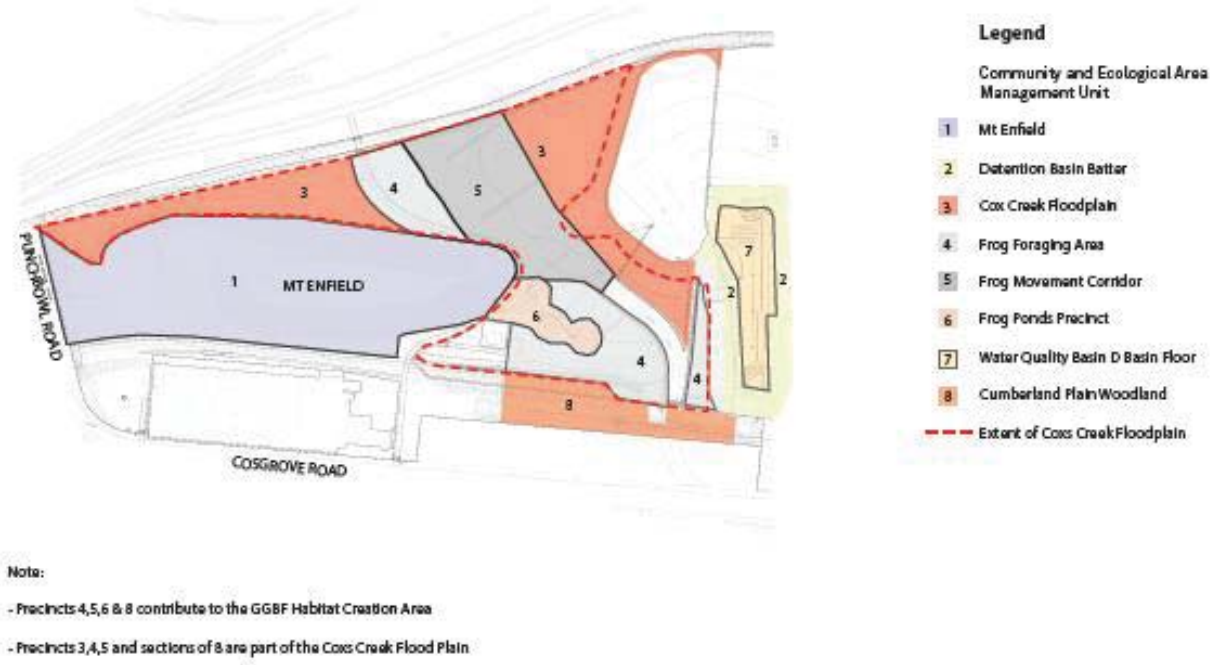

Figure 6 - Southern Ecological Area management precincts

Precinct 4 – Frog Foraging Area

Specific terrestrial and aquatic plant species have been recommended by NSW Ports' herpetologist to meet habitat requirements with regard to density of vegetation and foraging quality. In addition to the recommended native species, NSW Ports' herpetologist has identified Kikuyu grass as being desirable within the FHCA, as it is quick growing and provides optimal micro-habitats for the GGBF.

As per recommendations from NSW Ports' consulting herpetologist some of the already established Kikuyu in this area have been retained and incorporated into the FHCA. In addition, other areas are proposed to be planted to Kikuyu. Paths have been provided to separate Kikuyu grassland from native grassland plantings, allowing for manual removal of spreading Kikuyu.

During operation, access to the FHCA is to be restricted, open only for guided activities to community groups, schools and universities for educational purposes, and for maintenance and monitoring. It will not be open to the general public and is to be in the most part protected from internal access by the users of the ILC. Escorted access may be provided to approved groups (i.e. academic).

The proposed landscaping of the FHCA was provided to DP&I in a letter from Sydney Ports dated 18 April 2011 and subsequently in the Stage 2 CEMP Addendum. The landscape plans and plant schedules have been incorporated into Appendices A and B of this LEAMP.

Specific Management Actions for the FHCA are provided in Section 4 of this LEAMP.

Precinct 5 – Frog Movement Corridor

The ILC frog movement corridor will assist in providing interconnectivity between the GGBF populations in the Juno Parade Brickpit, the RailCorp (now Sydney Trains) Pond and the population which may re-establish itself in the ILC. The ILC frog movement corridor will connect the ILC frog ponds and the Sydney Trains Pond. The Sydney Trains Pond and the Juno Parade Pond will be connected via a new corridor that is being constructed by Sydney Trains.

The frog movement corridor has been designed by NSW Ports' consulting herpetologist and consists of a broad, grassed strip with central swale. To provide protection to the GGBF during movement, shelter areas of rock piles, sleeper piles and tussock plants have been incorporated at 50 metre intervals along the corridor.

Precinct 6 – Frog Ponds

Details of the operation and maintenance of the frog ponds are provided in the FHCA Operation and Maintenance Manual provided in Appendix C.

Precinct 8 – Cumberland Plain Woodland including SE Noise Mound

In accordance with CoA 2.14 and the approved Stage 2 CEMP, the main construction phase contractor constructed an earth noise mound in the south-east part of the site, prior to the commencement of construction of rail track work and hardstand for the intermodal terminal, empty container and warehousing components of the Project.

The proposed landscaping of the south east noise mound was provided to DP&I in a letter from Sydney Ports dated 7 April 2011 and subsequently in the Stage 2 CEMP Addendum. Landscaping of the south east noise mound was carried out to provide early stabilisation in May/June 2011, in accordance with these plans. The noise mound is landscaped using local endemic native species from the Cumberland Plain Woodland community. The species were selected to either match or complement the existing tree species on site and to provide a balanced scale and level of screening to the light industrial / commercial street corridor. Details of the plant species and associated densities for each Plant Community Type are provided in Appendices A and B.

Coxs Creek Floodplain (Precinct 3)

Part of the Coxs Creek Floodplain is included in the 2 ha of frog foraging area provided in the FHCA. Precincts 4, 5 and 6 are common to both sub-areas and have been discussed above. In addition there is a small area (Precinct 3) which is unique to the Coxs Creek Floodplain sub-areas. In Precinct 3 the only landscaping proposed is the removal of noxious weeds and the establishment of grasses due to the presence of a number of access tracks and to ensure that floodplain capacity is not diminished.

3.2.2 Summary of Key Management Issues

Construction:

The key management issues associated with the Southern Ecological Area during construction phases are:

- protection of GGBF from harm throughout the construction period;
- protection of identified Kikuyu and other suitable frog forage areas (if necessary and where possible);
- procurement of required plants;
- replacement of failed plantings during the Plant Establishment Period (if necessary);
- erosion, runoff and sediment control on Mt Enfield and surrounding areas;
- maintaining the integrity of the soil covering layer during revegetation works on Mt Enfield.

Operational:

The key management issues associated with the Southern Ecological Area during operations are:

- weed management and bush regeneration, including to the slopes of Mt Enfield and the Kikuyu edges;
- ongoing general landscape maintenance including weed management;
- vegetation (including tree) removal, lopping or pruning where required for security, Work Health & Safety and traffic safety requirements
- management of weeds without the use of herbicides in the FHCA in accordance with the Frog Management Plan;
- feral pest management as required;
- ensuring careful use of herbicides in areas adjacent to the Southern Ecological and Water Quality Areas to prevent harm to frogs;

- management of the frog ponds within the FHCA, including the monitoring of water levels, filling and drainage of ponds and clearing of vegetation as required;
- ongoing frog and frog habitat monitoring and reporting in accordance with the approved Frog Management Plan to assess the performance of the FHCA; and
- management and maintenance of public access to Mt Enfield.

Management measures to address these issues are provided in Section 4.

3.3 Stormwater Detention/Water Quality Basins

Three stormwater detention/ water quality treatment basins are provided within the ILC:

- Basin B - Northern Detention Basin;
- Basin F - Catchment F Stormwater Detention Basin and Water Quality;
- Basin D - Southern Stormwater Detention Basin and Water Quality Treatment.

The locations of these basins are shown on the drawings in Appendix A. Drawings showing the catchments draining to the basins are also included in Appendix A. The Basin Drawings are provided in Appendix D.

3.3.1 Landscaping Works

The basins have been designed to receive stormwater and remove pollutants from stormwater runoff from the site. Basin B drains an area in the north and centre of the site, Basin F drains warehouse area F and Basin D drains the southern area of the site.

The basins have been designed to satisfy sizing and functional requirements and aesthetic integration into the broader landscape context. The basins have been planted with Plant Community Type 7 (Appendix B) as it specifies local endemic species that achieve Water Sensitive Urban Design (WSUD) bioremediation functions, while incorporating habitat and aesthetic considerations into the broader landscape context. Access for maintenance has also been included in the basins.

The basins can be subdivided into two precincts, being the basin floor and the batters. Specific management actions for each of these precincts are included in Section 4 of this LEAMP. Appendix D provides additional detail regarding the on-going management of the basins.

3.3.2 Key Management Issues

Construction:

Basin D construction works were completed on 8 November 2013, Basin F construction works were completed on 20 December 2013 and Basin B construction works were completed on 24 January 2014.

The key management issues that were associated with the Stormwater Detention/Water Quality Basins during the construction phases were:

- procurement of required plants; and
- replacement of failed plantings during establishment period.

Operational:

The key management issues associated with the Stormwater Detention/Water Quality Basins during operations are:

- ongoing landscape maintenance including weed management;
- vegetation removal, lopping or pruning where required for security, Work Health & Safety and traffic safety requirements
- management of weeds without the use of herbicides or as approved by NSW Ports;
- monitoring and management of sediment and litter build up; and
- monitoring and management of erosion and scour.

The operational manual for the basins is provided in Appendix D.

Management measures to address these issues are provided in Section 4.

3.4 Internal Roads and Batters

3.4.1 Landscaping Works

All batters on the Enfield ILC site have been treated with the EcoBlanket treatment. Appendix E provides the on-going specifications for the EcoBlanket maintenance.

Internal batters have been landscaped with native grass mix (NGM) (Plant Community Type 2 in Appendix B). The grass mix was applied to the batters as a seed mix within a cover crop. The cover crop consists of 70% Japanese Millet and 30% Wimmera rye. The seed mix provides a complete erosion control solution immediately upon application.

Nature strips adjacent to internal roads have been landscaped with the same treatment as the batters. Some narrow land strips between the kerbs and footpaths have been turfed.

3.4.2 Key Management Issues

Construction:

The key management issues that were associated with the batters and internal roads during the construction phases were:

- procurement of required seeds and plants; and
- replacement of failed plantings during establishment period.

Operational:

The key management issues associated with the batters and internal roads during operations are:

- ongoing general landscape maintenance including weed management;
- vegetation (including tree) removal, lopping or pruning where required for security, Work Health & Safety and traffic safety requirements
- sediment and litter removal associated with high flow and storm events; and
- monitoring and management of erosion and scour.

Management measures to address these issues are provided in Section 4.

3.5 Fencing Schedule

The requirements for the staged temporary frog protection fencing during construction works are described in the Frog Protection Plan (Biosphere, 2009). The indicative location of frog protection fencing is shown in the drawings attached in Appendix A. Frog protection fencing was installed during construction, however it is not required during operations. The security access fencing will remain in place for all operational phases of the project.

Appropriate fencing will also be installed along the public access path on Mt Enfield to ensure the safety of visitors to the area, and to maintain the integrity of the landscaping on Mt Enfield.

4. Summary of Management Actions

This Chapter provides a summary of the general maintenance and ongoing management requirements that will be applied across the Enfield ILC, as well as a description of the specific management actions that are required to be used in each of the landscape management areas.

4.1 General Maintenance and Ongoing Management Requirements

The works shall include:

- weeding of grass and planting areas;
- supply and spreading of fertiliser to grass, landscape areas;
- pest and disease control of shrubs and trees;
- feral animal monitoring and control;
- maintenance of all grass areas including watering in prolonged dry periods; ;
- vegetation (including tree) removal, lopping or pruning where required for matters of security, Work Health & Safety and traffic safety requirements
- replacement of dead or failed plants; and
- removal of rubbish and debris in planting areas.

The following section outlines the general maintenance plan for landscape and ecological areas of the Enfield ILC including the Southern Ecological Area, the Stormwater Detention/Water Quality Basins, pre-leased lots and common areas.

4.1.1 Standards

All work shall be carried out with regard to standard horticultural and arboricultural practices.

Should the Landscape Contractor wish to modify the approach to any particular procedure then approval shall be required from NSW Ports.

The Landscape Contractor shall be a member of the Landscape Contractors Association of NSW or display suitable professional qualifications acceptable to NSW Ports and shall nominate a senior partner/personal experienced in maintenance nursery practices and horticulture, who shall be responsible for taking and carrying out instruction, and reporting any maintenance issues to NSW Ports.

4.1.2 Reporting

NSW Ports landscape contractors will be required to keep inspection records of all landscape and ecological management area actions as identified in the Tables below. All maintenance inspection records will be provided to NSW Ports and will include where relevant, key issues identified, the actions required to address the issues and date which the actions were completed.

4.1.3 Weeding

Remove all weed growth and re-occurring weed growth by hand, brush cutter or spray with herbicide unless otherwise specified throughout all planted and mulched areas. This work shall be executed at regular intervals as recommended in Section 4.1 so that the planted and mulched areas are generally weed free when observed at monthly intervals..

Care should be taken to protect all trees and shrubs from overspray and to avoid spraying if rain is likely in a 12 hour period.

Note: No spraying of herbicides in the FHCA.

4.1.4 Staking and Tying

Stakes and ties will be used as required to support plants and to avoid trampling. Developing plants exposed to severe wind conditions will have an appropriately sized stake and tie positioned in such a way so as not to cause damage via movement or restriction.

In the case of trees and tall shrubs three hardwood stakes will be placed obliquely with the first stake placed on the opposite side to the prevailing winds. Single staking is to be discouraged with large plants. Stakes should be removed when a plant has reached a self-supporting stage.

4.1.5 Plant Replacements

All plants that are shown to have died or failed (lost more than 50% of their normal foliage cover) shall be replaced with the same species and variety as the plant to be replaced with the closest commercially available size.

Generally plant material shall be uniformly high quality stock equal to best available for 'retail sale'. Plants shall be representative of optimum growth for the species as restricted by the container size.

The root system shall be balanced in relation to the size of the plant and shall be conducive to successful transpiration. Root conditions of plants may be determined by means of knocking out of plants from their containers and inspecting them.

Plants shall not exhibit signs of having been stressed at any stage during their development due to inadequate watering, excessive shade/sunlight, suffered physical damage or have restricted habit due to growth in nursery rows.

Plants shall be healthy, well grown, hardened off specimens of good shape and free from pests and disease. Trees and shrubs shall have been grown in their final containers for not less than 12 weeks. Plants shall be well rooted without any indication of having been restricted (pot bound) or damaged at any time.

4.1.6 Rubbish Removal

Routine maintenance is an ongoing day-to-day task which involves all assets and activities required to keep the ILC at Enfield operating safely and is the responsibility of all maintenance staff. Any bottles, paper, cigarette butts, etc, shall be removed by hand from the site. Leaf litter shall be removed from all paved areas and removed from site.

4.1.7 Drainage

Overflow drains shall be cleared of mulch and other foreign material. This work shall be executed regularly so that all overflow drains are cleared when observed as part of monthly inspections and maintenance schedule.

4.2 Southern Ecological Area Maintenance Requirements

Table 5 provides a summary of the management action requirements for the Southern Ecological Area.

Table 5: Southern Ecological Area Management Actions Requirements

Task Method	LEAMP Reference	Frequency	Indicative Timeframe	Responsibility
Environmental protection actions as per the approved CEMPs	NSW Ports Overarching CEMP (2014)	As required	Prior to and during construction	Construction contractors

Additional requirements as a result of Mod 5	Section 4.2.1	As required	During Mt Enfield Earthworks	Construction contractor
Management and maintenance of landscape and ecological areas as per approved OEMPs	NSW Ports OEMP and this LEAMP (refer Table 6 in Section 4.2.3)	Ongoing	Ongoing	NSW Ports and Landscape Contractors

4.2.1 Construction Management Actions

The Ecological Assessment undertaken as part of the Modification 5 response to submissions (Addition of Fill Material to Mt Enfield) identified a number of mitigation measures to be implemented for the protection of GGBF. These measures will be implemented for all future construction works proposed for Mt Enfield as follows:

- The north-south haul/maintenance road to Mt Enfield will be inspected after all rainfall events and any GGBF found relocated to the FHCA by NSW Ports Landscape Contractors before the haul/maintenance road is used. The Landscape Contractors have undertaken formal instruction regarding the correct handling and transport of GGBF from NSW Ports' Consulting Herpetologist.
- Truck movements along the north-south haul road to Mt Enfield will not occur outside daylight hours, unless otherwise undertaken under special authorisations issued under the project approval.
- No exclusion fences are to be placed around the haul road to ensure GGBF can move across the site in the night or during the day in wet weather.
- Dust suppression, including use of water tankers, will be used during earthworks activities at Mt Enfield to prevent wind-blown dust from reaching the FHCA and adjoining areas.
- Inspections will be carried out during the earthworks at Mt Enfield to identify predator presence on the site. Feral animal control measures should be implemented if predators, especially foxes and rats, are detected. The use of predator control measures should be carried out in consultation with NSW Ports' Herpetologist to ensure that the proposed measures are appropriate and not themselves a potential impact on the frogs.
- Predator inspections should continue during the landscaping and revegetation phase of the works. If the incidence of birds likely to attack GGBF, notably ibis and heron, increases as a result of the works or the revegetation, bird deterrent methods may

need to be used to prevent predation of any potential GGBF in the FHCA. NSW Ports' Consulting Herpetologist should be consulted to ensure that the proposed measures are appropriate and not themselves a potential impact on the frogs.

- Sediment and erosion control measures, including silt fences, will be erected downstream of active emplacement or earthworks areas which have not yet been stabilised to catch any silt from surface construction runoff and prevent sedimentation of downstream receiving waters.
- Any works which will penetrate the 100mm cover layer are to be undertaken in accordance with NSW Ports Site Management Plan (SMP) for the Southern Precinct.

4.2.2 Maintenance during defects liability period

NSW Ports' Landscaping Contractor will be contractually required to comply with a range of landscaping specifications, including landscaping performance and maintenance requirements for a specified defects period. Key landscaping contractual requirements include:

- The defects liability period for landscaping works is typically 52 weeks, where the contractor is liable for landscaping defects. The 52 weeks period commences after the date of landscaping Practical Completion.
- The contractor is required to replace failed (lost more than 50% of their normal foliage cover), dead and/or damaged plants as necessary throughout the plant establishment period.
- The contractor is required to thoroughly water the plants before planting, immediately after planting and as required to maintain growth rates free of stress. Plantings are to receive a minimum 3 complete watering (i.e. soaked to a depth of 200 mm) at fortnightly intervals for the first 6 weeks of plant establishment irrespective of natural rainfall.
- Weed growth is to be removed in landscaped area. This work shall be executed regularly so that the planted and mulched areas are weed free when observed at bi-weekly intervals.
- The contractor is responsible for the control of any pest or disease which may affect the plants.
- All plants to be provided by a nursery supplier which is an accredited member of Nursery Industry Association of Australia, or SW Nursery Industry Association or Quality assured under AS9002, or by Strathfield Municipal Council should it express an interest in supplying plants for this development and a commercial agreement can be reached during the landscaping tender process.

4.2.3 On-going Maintenance after defects liability period

After the defects liability period, NSW Ports will include the landscaped areas in its Assets Maintenance Schedule and will be managed by the Landscape Contractor. Refer to Table 6 for a list of on-going maintenance requirements. In addition to those activities listed in Table 6, NSW Ports and its Landscape Contractors will regularly inspect and maintain when required access gates to Mt Enfield and the FHCA, the public access path up Mt Enfield and the maintenance tracks and security fencing for the Southern Ecological Area.

The Frog Management Plan (FMP) (2010) states that herbicides may be used on the site provided that spray drift cannot reach the FHCA and that surface sprays cannot runoff into the FHCA. Any proposed use of herbicides in the Mt Enfield area will require NSW Ports' approval and will be undertaken in consultation with NSW Ports' consulting herpetologist.

The required actions for the management of the GGBF FHCA are provided in the FHCA Operation and Maintenance Management Manual attached in Appendix C and are not reproduced here. Additional requirements include:

- Restricting members of the public from entering the FHCA by ensuring that any public access to Mt Enfield restricts visitors to the nominated pathway and prevents unauthorised access to the FHCA.
- The FMP contains restrictions on the use of herbicides, particularly glyphosate products, around the frog ponds and the future frog movement corridor.

Table 6 outlines the proposed maintenance plan for the operational management actions for the Southern Ecological Area.

Table 6 – Southern Ecological Area Maintenance Plan

Subsystem	Maintenance Activity	Maintenance Interval	Latitude
General Landscaping • Southern Ecological Area	Routine inspection of vegetated area for: • Growth • Eroded areas • Vegetation presenting a safety or security risk • Dead plants/shrubs • Litter	Continual/on going	NA
	Maintenance Activity: • Mowing and general cleaning of dead plants/litter (outside known frog habitat)	Continual/on going	N/A

	• Weed removal (brush cutting or spraying) • Stabilisation of eroded areas • Replanting of bare areas	Continual/on going As required As required	N/A N/A 2 weeks
EcoBlanket • Mt Enfield	Routine inspection of Eco blanket for: • Unstable batter profile (slip, not true to line, bulging, slumping, scoured or eroded) • Presence of undesired vegetation (trees, noxious weeds, weeds in general) • Absence of desired vegetation (missing ground cover to bind batter face) • Water seepage or slope failures	6 monthly	2 weeks
	Event inspection of EcoBlanket condition after heavy rain event.	After 20mm rain event within 24hrs	1 week
	Maintenance activities: • Weeding and general cleaning of dead plants/litter • Repair of EcoBlanket • Replanting of bare areas	Continual As required As required	N/A N/A 2 weeks
Frog Habitat Area	General maintenance of frog habitat area including the actions from the FHCA Manual. Survey of frog activity	Monthly Monthly	N/A N/A

4.3 Stormwater Detention/Water Quality Basins Maintenance Requirements

Table 7 summarises the management action requirements for the stormwater detention/water quality basins. The Basins construction works were completed as part of the Stage 3 construction phase.

Table 7 – Stormwater Detention Basin Management Action Requirements

Task Method	LEAMP Reference	Frequency	Indicative Timeframe	Responsibility
Environmental protection actions as per the approved CEMPs	Stage 3 CEMP (completed)	As required	Prior to and during construction (Completed)	Construction contractors
Management and maintenance of landscape as per approved OEMPs	NSW Ports OEMP and this LEAMP (refer Table 8 and Appendix D)	Ongoing	Ongoing	NSW Ports and Landscape Contractor

Table 8 outlines the proposed maintenance plan for the operational management actions for the basins. Refer to Appendix D for details regarding the on-going management of the basins.

Table 8 – Stormwater Detention Basins Maintenance Plan

Subsystem	Maintenance Activity	Maintenance Interval	Latitude
General Landscaping	Routine inspection of vegetated area for: • Growth • Eroded areas • Vegetation presenting a safety or security risk • Dead plants/shrubs • Litter	Continual/on going	N/A
	Maintenance Activity: • Mowing and general cleaning of dead plants/litter (outside known frog habitat) • Weed removal (brush cutting or spraying) • Stabilisation of eroded areas • Replanting of bare areas	Continual/on going Continual/on going As required As required	N/A N/A N/A 2 weeks
Batter Treatment	Routine inspection of batter surface for:	Continual/on going	NA

• Basin batter	• Unstable batter profile (slip, fall release rocks, not true to line, bulging, slumping, scoured or eroded) • Presence of undesired vegetation (trees, noxious weeds, weeds in general) • Absence of desired vegetation (missing ground cover to bind batter face) • Deterioration of batter protection systems (batter scouring or jute damaged) • Water seepage or slope failures		
	Event inspection of batters condition after heavy rain event	After 20mm rain event within 24hrs	N/A
	Maintenance activities: • General cleaning of litter • Weed removal (brush cutting or spraying) • Repair and replanting of slopes	 Continual/on going Continual/on going As required	 N/A 2 weeks 2 weeks
Temporary Seal of non-vegetated areas	Routine inspection of seal condition for: • Cracks, ruts, heaving etc	Continual/on going	N/A
	Event inspection of seal condition after heavy rain event	After 20mm rain event within 24hrs	N/A
	Maintenance activities: • Weeding and/or spraying • Recompaction to level out uneven surfaces • Recoating with 7mm chipseal or equivalent	 As required As required As required	 N/A N/A N/A
Basins	Routine inspection of basin condition for: • Concrete batters unstable and scoured • Basin silted • Drains silted, scoured or blocked	6 months	2 weeks
	Event inspection of batters condition after heavy rain event	After 20mm rain event within 24hrs	N/A
	Maintenance activities: • Repair batters • Cleaning of drains and basins	As required As required	 2 weeks 2 weeks

	Remove sediment build up from forebays of bio-retention basins.	6 monthly or after rain as required	2 weeks
	Infill any holes in the filter media. Check for erosion or scour and repair, provide energy dissipation (e.g. rocks and pebbles at inlet) if necessary.	6 monthly or after rain as required	2 weeks
	Inspect for the accumulation of an impermeable layer (such as oily or clayey sediment) that may have formed on the surface of the filter media. Repair minor accumulations by raking away any mulch on the surface and scarifying the surface of the filter media between plants.	6 monthly or after rain as required	2 weeks
	Check for litter (including organic litter) in and around filter areas. Remove both organic and anthropogenic litter to ensure flow paths and infiltration through the filter media are not hindered.	6 monthly or after rain as required	2 weeks
	Assess plants for disease, pest infection, stunted growth or senescence.	As required for aesthetics	N/A
	Infill planting: between 6 and 10 plants per square metre should (depending on species) be adequate to maintain a density to the basin floor to ensure the plant's roots touch each other. Planting to be evenly spaced to help prevent scouring due to a concentration of flow.	As required	2 weeks
	Ensure that perforated pipes are not blocked to prevent filter media and plants from becoming waterlogged.	6 monthly or after rain	2 weeks
	Ensure inflow areas and grates over pits are clear of litter and debris and in good and safe condition. Inspect for dislodged or damaged pit covers and ensure general structural integrity. Remove sediment from pits and entry sites etc. (likely to be an irregular occurrence in mature catchment).	6 monthly or after rain	2 weeks

4.4 Internal Roads and Batters Maintenance Requirements

Table 9 summarises the management actions for the internal roads and batters.

Table 9: Internal roads and batters management actions

Task Method	LEAMP Reference	Frequency	Indicative Timeframe	Responsibility
Environmental protection actions as per the approved CEMPs	NSW Ports Overarching CEMP (2014)	As required	Prior to and during construction	Construction contractors
Management and maintenance of landscape as per approved OEMPs	OEMP and this LEAMP (refer to Table 4)	Ongoing	Ongoing	NSW Ports and Landscape Contractor

Table 10 outlines the proposed maintenance plan for the operational management actions for the internal roads and batters.

Table 10 – Internal Roads and Batters Maintenance Plan

Subsystem	Maintenance Activity	Maintenance Interval	Latitude
General Landscaping • **Internal road verges**	Routine inspection of vegetated area for: • Growth • Eroded areas • Vegetation presenting a safety or security risk • Dead plants/shrubs • Litter	Continual/on going	N/A
	Maintenance Activity: • Mowing and cleaning (outside known frog habitat) • Weed spraying	Continual/on going Continual/on going	N/A N/A
Batter Treatment	Routine inspection of batter surface for:	Continual/on going	N/A

• Warehouse batter • Internal road batter	• Unstable batter profile (slip, fall release rocks, not true to line, bulging, slumping, scoured or eroded) • Presence of undesired vegetation (trees, noxious weeds, weeds in general) • Absence of desired vegetation (missing ground cover to bind batter face) • Deterioration of batter protection systems (shotcrete cracked or jute damaged) • Water seepage or slope failures		
	Event inspection of batters condition after heavy rain event	After 20mm rain event within 24hrs or a few consecutive days with rain 10mm to 20mm	N/A
	Maintenance activities: • Mowing and cleaning • Weed spraying/removal • Repair and replanting of slopes	 Continual/on going Continual/on going As required	 N/A N/A 2 weeks
EcoBlanket • All batters	Routine inspection of Eco blanket for: • Unstable batter profile (slip, fall release rocks, not true to line, bulging, slumping, scoured or eroded) • Presence of undesired vegetation (trees, noxious weeds, weeds in general) • Absence of desired vegetation (missing ground cover to bind batter face) • Water seepage or slope failures	Continual/on going	N/A
	Event inspection of EcoBlanket condition after heavy rain event.	After 20mm rain event within 24hrs	N/A
	Maintenance activities: • Mowing and cleaning • Repair of EcoBlanket • Weed spraying/removal • Replanting of bare areas	 Continual As required As required As required	 N/A N/A N/A N/A

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Appendix A – AECOM Landscape Design Drawing Package

Drawing No	Document Title	Rev
MA-MD-LU-GE-900002	Landscape Key Plan	06
MA-MD-LU-GE-900003	Landscape Site Preparation Plan	06
MA-MD-LU-GE-900004	Landscape Vegetation Communities	08
MA-MD-LU-GE-900101	Landscape General Arrangement Plan – Sheet 1	09
MA-MD-LU-GE-900102	Landscape General Arrangement Plan – Sheet 2	09
MA-MD-LU-GE-900103	Landscape General Arrangement Plan – Sheet 3	08
MA-MD-LU-GE-900201	Landscape Planting Plan – Sheet 1	07
MA-MD-LU-GE-900202	Landscape Planting Plan – Sheet 2	06
MA-MD-LU-GE-900203	Landscape intermodal terminal area finish plan – Sheet 1	06
MA-MD-LU-GE-900204	Landscape intermodal terminal area finish plan – Sheet 2	01
MA-MD-LU-GE-900930	Landscape details: frog pond – sheet 1	06
MA-MD-LU-GE-900931	Landscape details: frog pond – sheet 2	04
MA-MD-CI-DR-170001	Drainage catchment and overall site plan – sheet 1	05
MA-MD-CI-DR-170002	Drainage catchment and overall site plan – sheet 2	05
MA-MD-CI-DR-170003	Drainage catchment and overall site plan – sheet 3	05

Appendix B – AECOM Plant Schedules

Notes:

1. The species listed below may be varied if they are not available at the time of planting or the Contractor identifies a more suitable species from the same community.
2. The locations of the plant communities are shown on Drawings MA-MD-LU-GE-900201, MA-MD-LUGE-900202 and MA-MD-LU-GE-900203.

Botanic Name	Pot Size	Spacing (mm)	Spacing (per m^2)	% Mix
Plant Community Type 1: Cumberland Plain Woodland (CPW)				
Canopy and Midstratum Trees				
Acacia decurrens	Cell	2500	0.16	5
Acacia parramattensis	Cell	2500	0.16	5
Acacia implexa	Cell	2500	0.16	5
Eucalyptus crebra[1]	Cell	2500	0.16	5
Eucalyptus eugenioides	Cell	2500	0.16	10
Eucalyptus molucanna	Cell	2500	0.16	30
Eucalyptus tereticornis	Cell	2500	0.16	30
Melaleuca decora[2]	Cell	2500	0.16	10
Shrub Understorey				
Acacia falcate	Cell	1200	0.69	10
Bursaria spinosa	Cell	1200	0.69	60
Dodonea viscosa ssp cuneata[3]	Cell	1200	0.69	20
Indigophora australis	Cell	1200	0.69	10
Ground Layer				
Bothriochloa decipiens/macra	Cell	325	12	1
Capillipedium parviflorum	Cell	325	12	20
Chloris ventricosa	Cell	325	12	1
Commelina cyanea	Cell	325	12	1
Cymbopogon refractus	Cell	325	12	1
Danthonia spp	Cell	325	12	5
Dianella longifolia	Cell	325	12	1
Dichelachne micrantha	Cell	325	12	1
Dichondra repens	Cell	325	12	1
Imperata cylindrica	Cell	325	12	10
Microlaena stipoides	Cell	325	12	3
Poa labillardieri	Cell	325	12	1
Sorghum leilocladum	Cell	325	12	13
Themeda australis	Cell	325	12	40
Walenbergia stricta/communis	Cell	325	12	1

[1] Could be replaced or supplemented with *Eucalyptus fibrosa* or *Eucalyptus sideroxylon*
[2] Could be supplemented with *Melaleuca stypheioides*
[3] Could be supplemented with *Dodonaea triquetra*

Plant Community Type 2: Native Grass Mix (NGM)				
Ground Layer				
Acacia myrtifolia	Seed	NA		
Acacia suaveolens	Seed	NA		
Dianella caerulea	Seed	NA		
Hardenbergia violacea	Seed	NA		
Indigofera australis	Seed	NA		
Kennedia rubicunda	Seed	NA		
Lomandra longifolia	Seed	NA		
Pultenaea retusa	Seed	NA		
Pultenaea villosa	Seed	NA		
Cover crop: will consist of 70% Japanese Millet and 30% wimerra rye. *10 kg/H native seed and 40 kg/H cover crop*				
Plant Community Type 3: Frog Movement Corridor (GFC)				
Ground Layer				
Capillipedium parviflorum	Cell	325	12	25
Imperata cylindrica	Cell	325	12	15
Lomandra filiformis subsp. filiformis	Cell	325	12	2
Lomandra longifolia[4]	Cell	325	12	6
Lomandra multiflora subsp. multiflora	Cell	325	12	2
Microlaena stipoides	Cell	325	12	5
Sorghum leilocladum	Cell	325	12	20
Themeda australis	Cell	325	12	25
Plant Community Type 4: Improved Forage Type A (IMF A)				
Ground Layer				
Kikuyu. Sp	Rolls			
Plant Community Type 5: Improved Forage Type B (IMF B)				
Ground Layer				
Capillipodium specigerum	Cell	325	12	30

[4] Additional *Lomandra longifolia* may be required if *L. multiflora* and *L. filifornis* is difficult to source in quantity

Sorghum leilocladum	Cell	325	12	30
Themeda australis	Cell	325	12	40
Plant Community Type 6: Sheoak Forest (SF - CL, SF-AT, SF-CG)				
Canopy and Midstratum Trees				
Casuarina littoralis	Cell	1200	0.69	100
Allocasuarina torulosa	Cell	1200	0.69	100
Casuarina glauca	Cell	1200	0.69	100
Ground Layer				
Dianella revoluta	Cell	1200	0.69	100
Dianella caerulea	Cell	1200	0.69	100
Dianella longifolia	Cell	1200	0.69	100
Gahnia aspera	Cell	1200	0.69	100
Lomandra longifolia	Cell	1200	0.69	100
Plant Community Type 7: Bioretention System (BIO)				
Canopy and Midstratum Trees				
Melaleuca styphelioides	Cell	2500	0.16	3
Shrub Understorey				
Banksia robur	Cell	1200	0.69	2
Banksia spinulosa	Cell	1200	0.69	2
Callistemon citrinus	Cell	1200	0.69	3
Callistemon pinifolius	Cell	1200	0.69	2
Leptospermum juniperinum	Cell	1200	0.69	2
Ground Layer[5]				
Bolboschoenus caldwellii	Cell	325	12	15
Carex appressa	Cell	325	12	15
Carex inversa	Cell	325	12	2
Fimbristylis dichotoma	Cell	325	12	3
Gahnia sieberiana	Cell	325	12	2
Imperata cylindrica	Cell	325	12	10
Juncus usitatus	Cell	325	12	20
Lomandra filiformis subsp. filiformis	Cell	325	12	3

[5] Additional *Carex appressa, Juncus usitatus* and *Juncus subsecundus* may be required if *Pteridium esculentum, Lomandra multiflora* and *Lomandra filiformis* are difficult to source in quantity.

Lomandra longifolia	Cell	325	12	10
Lomandra multiflora subsp. multiflora	Cell	325	12	5
Pteridium esculentum	Cell	325	12	5
Plant Community Type 8: Frog Ponds (FRP)				
Ground Layer				
Eleocharis sphacelata	Cell	325	12	50
Schoenoplectus validus	Cell	325	12	50
Plant Community Type 9: Swale (SWL)				
Ground Layer				
Carex appressa	Cell	325	12	30
Juncus usitatus	Cell	325	12	50
Paspalum distichum	Cell	325	8	20
Plant Community Type 10: Native Slope Tree & Shrub Mix (NSTM)				
Ground Layer				
Acacia decurrens	Cell	2500	0.16	15
Acacia implexa	Cell	2500	0.16	15
Casuarina littoralis	Cell	1200	0.69	20
Dodonaea viscosa ssp. cuneata	Cell	1200	0.69	20
Indigophora australis	Cell	1200	0.69	20
Hemarthria uncinata	Cell	1200	0.69	20
Plant Community Type 11: Native Slope Mix (NSM)				
Ground Layer				
Chloris ventricosa	Cell	325	12	15
Danthonia spp	Cell	325	12	15
Imperata cylindrica	Cell	325	12	20
Lomandra longifolia	Cell	325	12	15
Microlaena stipoides	Cell	325	12	20
Hemarthria uncinata	Cell	1200	0.69	15

Appendix C – FHCA Operation and Maintenance and Management Manual

Frog Habitat Creation Area Operations and Maintenance Plan

Enfield Intermodal Logistics Centre – July 2014

NSW Ports

Document Control

Revision	Date	Approved	Details of Revision
Draft 0.1 – 0.3 (Revisions A – J)	6/8/12	Sydney Ports	Development of draft document by Sydney Ports
Draft 0.4	4/8/14		NSW Ports draft
Final v1.0	4/8/14	NSW Ports	Final
Final v2.0	August 2016	NSW Ports	First revision

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1. Introduction

This Operations and Maintenance (O&M) Plan has been prepared for the management and maintenance of the Green and Golden Bell Frog (GGBF) *Litoria aurea* habitat area which has been created within the Intermodal Logistics Centre (ILC) at Enfield site in accordance with the Project Approval. This O&M Plan forms part of the relevant Operational Environmental Management Plan covering this part of the ILC site.

Conditions 2.48 and 2.48A of the Project Approval require the following:

- creation of an overwintering habitat as part of the 2 hectare frog foraging habitat zone in the southern end of the ILC site (Appendix A);
- provision of linkages to the former RailCorp ponds (these are located on the opposite side of the Enfield Marshalling Yards);
- restrictions on the use of herbicides in known frog habitat and attainment of water quality standards for water discharged from the site;
- measures related to the ongoing management of Mt Enfield.

The GGBF is an endangered species listed under Schedule 1 of the NSW Threatened Species Conservation Act 1995. GGBF have been recorded at several sites in the Enfield - Greenacre area.

This habitat area is referred to as the “Frog Habitat Creation Area” (FHCA). This O&M Plan includes the information necessary to operate the frog ponds and associated drainage and mechanical equipment within the FHCA.

The FHCA comprises three frog ponds, a frog movement corridor and a frog foraging area incorporating refuge piles (with a total area of 2 ha). Frog pond 1 is a storage pond which sources its water from stormwater water quality Basin D (Appendix A).

Frog ponds 2 and 3 are ephemeral breeding ponds constructed from sandstone ballast and clay lining. Sandstone ballast is also provided at the bottom of the outlet drainage lines and pond overflows to limit erosion.

The frog ponds can be drained through valves and outlets via overland flow to the Cox’s Creek canal. A number of frog refuge piles are located around the three frog ponds.

Access to and from the frog ponds is via a 1.3 m wide gravel access path and a site maintenance shed has also been provided for the storage of equipment, records and use of NSW Ports’ staff and contractors.

2. Long Term Management of the FHCA

The main objective of this O&M Plan is to provide the information necessary for the long term operation and maintenance of the FHCA.

The FHCA works, including the ponds were completed in 2011. The water supply connection from bio-retention Basin D was completed in 2013. The drawings referred to in this section are provided in Appendix A.

2.1. Permanent Frog Ponds Operation and Management

Drawing MA-MD-LU-GE-900102 provides the permanent frog ponds general arrangement plan. Three ponds (Ponds 1, 2 and 3) of approximately equal size have been provided. Pond 1 stores and supplies water to Ponds 2 and 3. Ponds 2 and 3 are drainable and operate with fluctuating water levels. More details of the pond operation and management are provided in the sections below.

2.2. Pond Water Supply and Water Quality

Water from the stormwater Basin D is the main source of water to the pond system and connects to Pond 1 via a gravity fed pipe. When there is water in Basin D, high flows are automatically directed to Pond 1 to be stored until required for manual top up of Ponds 2 and 3. The flow rate from Basin D to Pond 1 is controlled by the size of the supply pipe (200mm diameter) and the depth of water in the Basin.

Water is supplied from Pond 1 to Ponds 2 and 3 by gravity fed pipes manually controlled by separate valves for each pond. Pond 1 is designed to overflow via a rock spillway onto the floodplain rather than drain into the Ponds 2 and 3, thus protecting the habitat in the frog ponds. Pond inlets are provided with rock protection to prevent erosion of the pond embankment and damage to pond plants.

2.3. Pond Water Levels

Unless the ponds are being drained, water should always be present in Ponds 2 and 3 and the depth should, if possible, fluctuate between 0.5 to 1.0 m. Ponds 2 and 3 must be topped up to a maximum of 1.0 m, if possible, from Pond 1 when the water levels in either of these ponds drop below 0.5 m. During normal operation, the top water level in Ponds 2 and 3 will automatically be retained at a level of no greater than 1.0 m through the use of an overflow riser.

Ponds 2 and 3 do not have a large catchment area draining directly to them and are therefore unlikely to overflow unless heavy rain occurs when they are already full. Any overflow from Ponds 2 and 3 will pass via separate spillways onto the adjoining floodplain.

Fluctuation in water levels in Ponds 2 and 3 and the rate of flow received in these ponds will therefore be mainly controlled by the operation of the valves directing flow from Pond 1, enabling protection of the habitat in the ponds. The plantings in Ponds 2 and 3 have been designed for the fluctuation in pond water level.

Pond water levels will be checked during regular site inspections and frog monitoring surveys.

2.4. Pond Dewatering

Ponds 2 and 3 are drainable by a gravity outlet pipe, controlled by a valved drainage outlet, to permit manual removal of water from the ponds.

Each winter, or as considered necessary by NSW Ports in consultation with the Consulting Herpetologist, one pond will be drained and allowed to become dry, allowing the surrounding emergent vegetation to regress and die. The emptied pond will be refilled in the following August and the natural succession of aquatic plants allowed to proceed.

The choice of pond to drain will depend on the state of the vegetation around the pond and frog activity at the pond. The pond that is more thickly vegetated with only few or no GGBF detected during the monitoring sessions should be drained. If the pond is sparsely vegetated and GGBF are active about the pond, the water in the pond should be retained. The period between pond drainage must preferably not exceed 2 years.

The decision to drain a pond, and any requirements for the draining of the pond, will be made by NSW Ports in consultation with the Consulting Herpetologist. Any tadpoles present in the pond will be relocated prior to draining the pond.

Pond drainage will also enable removal of unwanted pests from the ponds, in particular Plague Minnows *Gambusia holbrooki*. These small fish are present in the brickpit lake and are known to prey on the tadpoles and eggs of GGBF. They can be transported by birds between aquatic sites, resulting in pond infestation. If these fish are allowed to remain in a pond the chance of them being transported to another pond is high. Should *Gambusia* be found in one of the ponds, the pond must be drained during the next winter and the fish killed.

2.5. Emergent Plants

As part of the establishment of the FHCA, emergent plants have been planted in clumps in each of the ponds, as shown on Drawing MA-MD-LU-GE-9000930. These plants:

- provide shelter for frogs during the day;
- provide basking sites for frogs during the day;

- act as insect attractants (i.e. food for the frogs).

The plants chosen for the ponds are all multiple-stemmed, erect rushes and include:

- Sedge *Schoenoplectus validus*
- Spike Rush *Eleocharis sphacelata*

After a few years these plants will become too thick and need to be reduced. At this stage, the pond should be drained and the plants allowed to die back. It is not anticipated that manual harvesting of the planted emergent plants will be required. If manual harvesting is required, the Consulting Herpetologist will advise NSW Ports to this effect.

2.6. Fringing Vegetation

Fringing vegetation provides shelter habitat as well as foraging areas close to the breeding ponds. As adult Bell Frogs feed mainly on large arthropods, often the most suitable foraging habitat is overgrown grassland. The fringing vegetation adopted for the FHCA consists of:

Improved Forage Type A

- *Kikuyu. Sp*

Improved Forage Type B

- *Capillipodium specigerum*
- *Sorghum leilocladum*
- *Themeda australis*

as shown on Drawing MA-MD-LU-GE-900202.

Fringing vegetation should be allowed to become long and straggly.

2.7. Shelter Habitat

Shelter for GGBF has been provided in the form of:

- emergent plants around the ponds;
- sleepers and/or rock piles around the ponds;
- Mat Rush thickets and sleeper piles on the grassed area around the pond and at set points along the frog corridor as shown on Drawings MA-MD-LU-GE-900930 and MAMD-LU-GE-900931.

At Enfield, the main predators of GGBF will be birds such as White-faced Herons, White Ibis, cormorants and egrets. These birds are likely to inhabit the ponds when vegetation levels are low (i.e. when a pond is being dried out or refilled).

Birds will prey on tadpoles in the ponds. Logs or long branches laid across the pond will provide some protection for tadpoles and also basking sites for adult GGBF. If the vegetation is low and does not provide adequate protection for the tadpoles, flutter ribbons will be suspended above the ponds to deter the birds (similar to those used at the Marrickville Bell Frog Pond). If bird scaring devices are required, the Consulting Herpetologist will advise NSW Ports as to the measures required and equipment needed. Foxes constitute the other main potential predator at Enfield. At this stage no measures are considered to be practicable in the control of foxes.

Some areas around the frog ponds will need to be periodically mowed. Meandering paths approximately up to 2 m wide should be cut through the kikuyu grass occasionally using a whipper snipper or brushcutter to assist foraging activities by the frogs. Areas around the swale drains and along the edges of the access path will also need to be mowed.

2.8. Frog Movement Corridor

Foraging areas and shelters have been created around the ponds at the ILC. Dispersal to nearby habitats at Juno Parade and at the Sydney Trains pond will be facilitated through the construction of a Frog Movement Corridor in the location shown on Drawings MA-MD-LUGE-900102 and MA-MD-LU-GE-900930.

The Frog Movement Corridor consists of an approximately 10 m wide area of sown grass with a central swale, as shown on Drawings MA-MD-LU-GE-900102 and MA-MD-LU-GE-900103. The corridor will planted with native tussock grasses or exotic grasses. Sleeper piles will be established at regular intervals along the corridor to provide temporary refuge for dispersing frogs. Some tussocks plants, such as *Lomandra longifolia*, will also be planted near these refuge sites.

The swale will collect water after rain and remain as a damp thoroughfare leading to the frog ponds in the FHCA. The swale is approximately 1 m wide and 10 - 20 cm below ground.

The swale may need to be mowed periodically. The Consulting Herpetologist will advise NSW Ports when this is required.

2.9. Use of Herbicides

Herbicides, particularly glyphosate products, are not to be used around the ponds and the movement corridor. If herbicides are required to be used in the FHCA, approval will need to be given by NSW Ports. Any proposal for pesticide usage in the FHCA will be discussed with the Consulting Herpetologist. In general, spraying of herbicides would not be permitted but cutting and painting weeds may be acceptable under some circumstances. Herbicides may be used on other parts of the site provided that spray drift cannot reach the FHCA and that surface sprays cannot enter surface water run-off and enter the FHCA.

Signs will be erected around the FHCA indicating that herbicides, particularly glyphosate products, are not to be used around the ponds. Responsible land managers will also be briefed regarding this matter.

2.10. Sick or Dead Frogs

The management of dead or treatment of sick frogs must be carried out by NSW Ports' Consulting Herpetologist. Frogs that are caught and held in captivity because they appear to be sick must be kept isolated on site. Any frogs that die in captivity or are found dead within the FHCA must be retained. The carcass must be picked up with gloved hands and the body preserved in a prepared specimen container filled with buffered formalin. The gloves should be disposed of after this. All handling procedures of frogs must conform to the NSW National Parks and Wildlife Service Guidelines for Frog Handling and Frog Hygiene (Appendix C).

If NSW Ports' staff or contractors encounter sick or dead frogs within the FHCA, they should notify the NSW Ports Enfield Site Manager who will notify the Consulting Herpetologist who will provide advice and/or deal with the frog from this point onwards.

2.11. Frog Monitoring and Reporting

Frog monitoring within the FHCA will be carried out by the Consulting Herpetologist monthly between late August and April for 3 years after the completion of the FHCA, or until the Office of Environment and Heritage is satisfied that the FHCA has fulfilled its requirements.

An additional two nights per year will be allowed for opportunistic surveys by the Consulting Herpetologist which are carried out when breeding activity is likely to be highest and frog population estimates can be carried out. This monitoring will comprise:

- calling surveys: an estimate of the number of male GGBFs calling at each pond or location will be recorded. If no GGBFs are calling, play back recordings are to be used to try to elicit calling;
- headlamp searches: searches using headlamps;
- tadpole survey: sites containing freshwater will be netted using hand nets and all tadpoles caught will be identified and returned to the site of capture.

All GGBFs seen or caught during monitoring surveys will be recorded, measured and sexed. Unchipped GGBFs will be micro-chipped. Frog location, activity and microchip number will also be recorded. Frogs will be released at the site of capture.

The extent of movement between the surrounding habitat areas will also be monitored so that future corridors can be considered and the adequacy of existing corridors assessed.

In accordance with CoA 2.48 of the Project Approval, the results of the monitoring will be reported to the Office of Environment and Heritage, at an agreed frequency. The Consulting

Herpetologist will provide the results of the monitoring in a report to the Office of Environment and Heritage and NSW Ports, in the first 3 years. The report will contain information on:

- the arrival of GGBF into the FHCA;
- the relative frog numbers in the FHCA over time;
- the number of migrating frogs from satellite populations entering the FHCA;
- the number of frogs dispersing from the FHCA;
- the success of the FHCA;
- recommendations regarding management strategies;
- the status of actions assigned to NSW Ports under the Management Plan for the GGBF at Greenacre (DECC 2007).

2.12. Access

The Community and Ecological Area, within which the FHCA will be contained, will be fully fenced and access to the general public will be restricted. Authorised members of the public will only be allowed into the FHCA when escorted by NSW Ports' staff or the Consulting Herpetologist. Members of the public will be supervised while on site.

2.13. Long term maintenance and management actions

The activities and actions required to be carried out for the long term maintenance, management, monitoring and reporting of the FHCA are provided in Table 1 and Table 2 below.

Table 1: Long term maintenance and management of FHCA

Task	Description	Timing/frequency	Who
Weed removal	Handpick weeds from within frog pond enclosure including bulrush from within ponds	Monthly for the first 3 years than as required	FHCA Landscape Contractor
Inspection	Visually inspect area within frog pond enclosure for: • Dead frogs • Damage • Erosion • Plant die off • Water pollution, algae etc Report any occurrence of above to Environment Manager	Monthly for the first 3 years than as required	FHCA Landscape Contractor

Swale and grass cutting	Cut 1-2m wide meandering paths in kikuyu grass surrounding rock piles/ponds using whipper snipper/brush cutter. Clear access paths, rock lined overflow paths and valve standpipes of any overgrowth. Cut swale in central movement corridor	Quarterly or as required/advised by Herpetologist	FHCA Landscape Contractor
Pond levels	Top up water levels in Ponds 2 & 3 to invert of overflow riser (1 metre). See Table 2 below for instructions on use of valves.	Check monthly, and top up when approx. 0.5m below overflow riser	FHCA Landscape Contractor
Empty ponds	Either Pond 1 or 2 to be drained completely and not refilled until August of following year (*advice of Herpetologist to be sought prior to draining*).	Each winter	FHCA Landscape Contractor
	Any tadpoles to be relocated from pond to be drained.	As required	
	Install flutter ribbons above ponds to deter birds from eating tadpoles.	As required	
Sick or dead frogs	Sick or dead frogs must be immediately reported to the Site Manager.	As required	FHCA Landscape Contractor
Mechanical maintenance	Visual examination of valves for any rusting or damage. Visual inspection of shed for signs of damage, graffiti, corrosion etc.	Annually	FHCA Landscape Contractor
Frog monitoring and Reporting	Actions outlined in 2.11	As per 2.11	FHCA Landscape Contractor and

			Consulting Herpetologist

Table 2: Operation of Pond Valves

Component	Operational Requirements	Specification
Butterfly valve with Spline Key and Pinless	To open the valve, turn the lever shaft clockwise, and to close the valve, turn the lever anticlockwise The regulation is carried out by the notch flange and the lever's latch. The latch is clutched from the flange and it is turned in the appropriate direction to open or close the valve. Then the latch is clutched again in the flange in the desired position.	Detailed drawings provided in Appendix B of this Plan.

2.14. Key Contacts

During the long term management and maintenance of the FHCA a number of key personnel and advisors will need to be involved. Their details and roles are provided in Table 3 below.

Table 3: Key contacts and roles

Stakeholder/Supplier	Product/Details
NSW Ports Enfield Site Development Manager	Responsible for overall management of the ILC site
NSW Ports Environment Manager	Responsible for providing environmental and planning compliance with the Project Approval conditions.
FHCA Landscape Contractor	Landscape maintenance
Bakers Construction and Industrial	Butterfly Valve Series: 2500/2600
Consulting Herpetologist	Responsible for providing expert advice as required on FHCA management and for monitoring and reporting on GGBF and FHCA in accordance with this plan

3. References

Sydney Ports Corporation (March 2010). Green and Golden Bell Frog Management Plan ILC Frog Management Plan Rev 4.

DECC & Sydney Metropolitan Catchment Management Authority (May 2007). The Green and Golden Bell Frog Key Population at Greenacre.

NPWS (August 2001). Threatened Species Management Information Circular No 6: Hygiene Protocol for the Control of Disease in Frogs.

Appendix A – FHCA Detailed Design Drawings

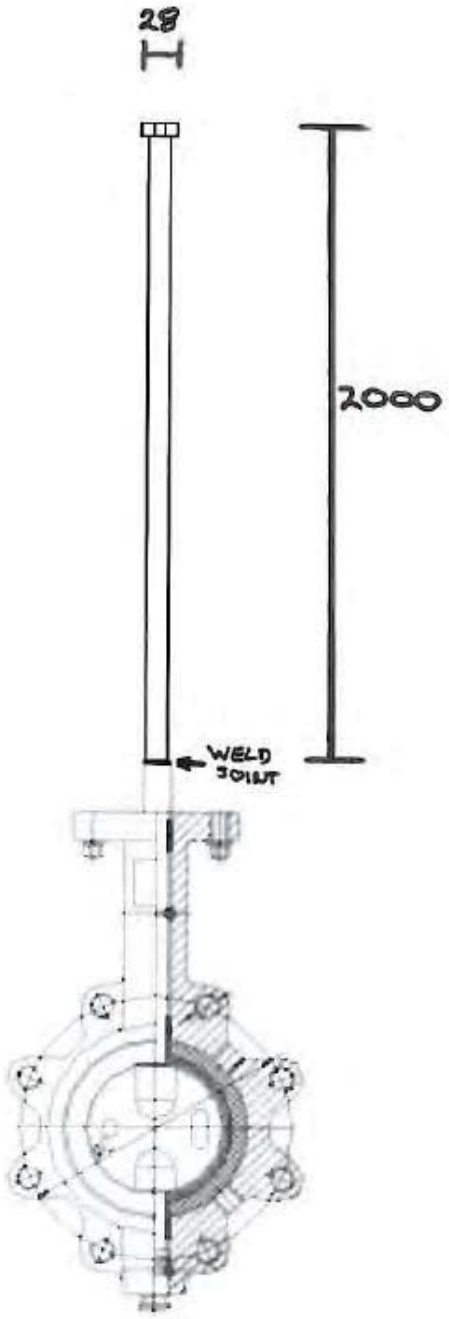
(All Drawings are provided in the LEAMP Appendix A)

Landscape • Drawing MA-MD-LU-GE-900102 Rev 09 • Drawing MA-MD-LU-GE-900103 Rev 08 • Drawing MA-MD-LU-GE-900202 Rev 08 • Drawing MA-MD-LU-GE-900930 Rev 07 • Drawing MA-MD-LU-GE-900931 Rev 04
Drainage • Drawing MA-MD-CI-DR-170001 Rev 05

Appendix B – FHCA Technical Drawings

Valve

ARITA VALVE Series 2500/2600 Butterfly Valve with Spline Key and Pinless Sketch with 2000 mm 28 mm spindle extension



150mm diameter butterfly valve with 2m long 28mm diameter spindle extension

NOT TO SCALE

ARITA VALVE

Series:2500/2600 BUTTERFLY VALVE WITH SPLINE KEY AND PINLESS

BODY TYPE

Wafer & Lug Type

TECHNICAL DATA

Size: 2"-24"

Nominal Pressure: PN10/PN16

Working Temperature: -15℃~135℃

Suitable Medium: water,steam,oils, acids, alkalis, salts, etc.

STANDARD

Design Standard: API609,BS5155

Face to Face : ISO5752, API609 MSS SP-67

Body Flange Drilling : DIN2501 ;ANSI125/150;AS2129; BS4504;JISB2210 10K;

Top Flange : ISO5211

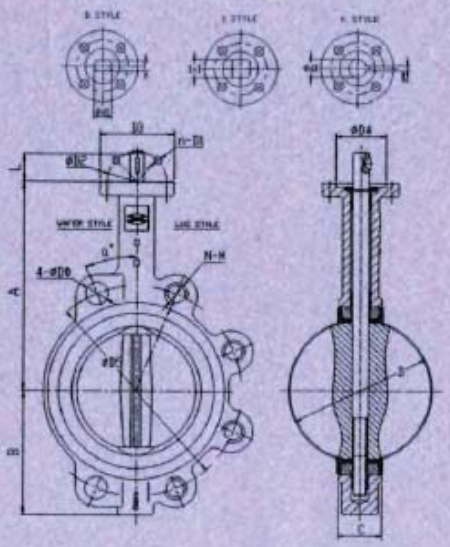
Test Inspection : API598,

VALVE OPERATOR

2"~12" Lever Operator

2"~24" Worm Gear, Electric Actuator and Pneumatic.

OVERALL &DIMENSIONS



MATERIAL OF MAIN PARTS

No	Item	Material	Symbol
1	Body	Cast iron	ASTM A126 CL. B GG25
		Ductile iron	ASTM A536 65-45-12 GGG40
		Carbon steel	ASTM A216 WCB
		Stainless steel	ASTM A351 CF8 CF8M
		Bronze	ASTM B148 C954
2	Disc	Ductile iron	ASTM A536 65-45-12 GGG40
		Carbon steel	ASTM A216 WCB
		Stainless steel	ASTM A351 CF8 CF8M
		Bronze	ASTM B148 C954
		Coated	EPDM-VITON-Nylon
3	Stem	Stainless steel	ASTM A182 304, 316, 410
		Alloy	Monel K500
4	Seat	Elastomer	Working Temperature
		EPDM	-15℃~140℃
		NBR	-10℃~80℃
		VITON	-20℃~150℃
		PTFE	-15℃~205℃
5	Bushing	PTFE	
		Bronze	

Size	A	B	C	D	L	D1	D2	D3	D4	a°	Φd1	K	IX I	F
2"	161	80	42.0	52.9	32	7	50	65	35	45°	12.6	3	9X9	10
2.5"	175	89	44.7	64.5	32	7	50	65	35	45°	12.6	3	9X9	10
3"	181	95	45.2	78.8	32	7	50	65	35	45°	12.6	3	11X11	10
4"	200	114	52.1	104	32	10	70	90	55	22.5°	15.77	5	11X11	12
5"	213	127	54.4	123.3	32	10	70	90	55	22.5°	18.9	5	14X14	14
6"	226	139	55.8	155.6	32	10	70	90	55	22.5°	18.9	5	14X14	14
8"	260	175	60.6	202.5	40	12	102	125	70	15°	22.1	5	17X17	17
10"	292	203	65.6	250.5	40	12	102	125	70	15°	28.45	8	22X22	22
12"	337	242	76.9	301.6	40	12	102	125	70	11.25°	31.6	8	22X22	24
14"	368	267	75	333.5	45	12	102	125	70	11.25°	31.6	8	22X22	24
16"	400	309	85.7	389.6	52/72	18	140	175	100	11.25°	3.1/37.9	10	27X27	27
18"	422	328	104.6	440.5	52/72	18	140	175	100	11.25°	38/42.9	10/12	27X27	27
20"	480	360	130.3	491.6	64/82	18	140	175	100	9°	41.1/45.7	10/12	36X36	32
24"	562	460	151.4	592.5	70/82	23	165	210	130	9°	50.6/54	16	36X36	36

◆ The dimensions N-M,D0 ,D1 Conforms to DIN2501,ASME B16.1,BS4504,ISO2531,JIS B2210.

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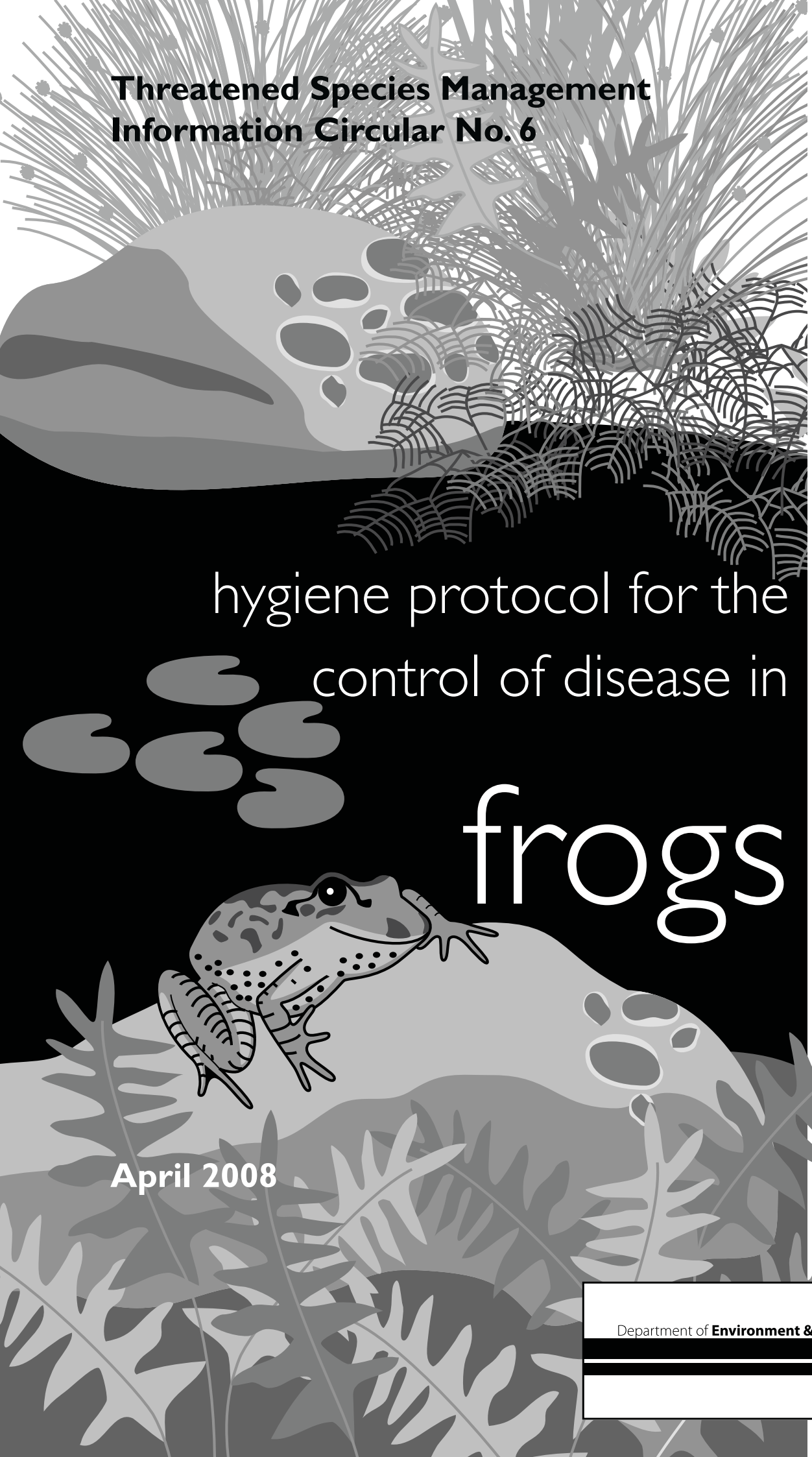
Appendix C – Hygiene Protocol for the Control of Disease in Frogs, NPWS August 2001

Threatened Species Management Information Circular No. 6

hygiene protocol for the control of disease in frogs



April 2008

Department of **Environment & Climate Change** NSW

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hygiene protocol for the control of disease in frogs

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1 introduction

This information circular outlines measures to:

- Prevent or reduce disease causing pathogens being transferred within and between wild populations of frogs.
- Ensure captive frogs are not infected prior to release.
- Deal safely with unintentionally transported frogs.
- Assist with the proper identification and management of sick and dead frogs in the wild.

1.1 Who should read this document?

This protocol is intended for use by all researchers, wildlife consultants, fauna surveyors and students undertaking frog field-work. In addition, the protocol should be read by Department of Environment and Climate Change (DECC) personnel, frog keepers, wildlife rescue and carer organisations, herpetological/frog interest groups/ societies, fauna park/zoo operators/workers and other individuals who regularly deal with or are likely to encounter frogs.

This protocol outlines the expectations of the DECC regarding precautionary procedures to be employed when working with frog populations. The intention is to promote implementation of hygiene procedures by all individuals working with frogs. New licences and licence renewals will be conditional upon incorporation of the protocol. The DECC recognises that some variation from the protocol may be appropriate for particular research and frog handling activities. Such variation proposals should accompany any licence application or renewal to the DECC.

1.2 Background

1.2.1 Amphibian Chytrid Fungus

The apparent decline of frogs, including extinctions of species and local populations, has attracted increased international and national concern. Many potential causes for frog declines have been proposed (eg see Pechmann et al., 1991; Ferrero and Bergin, 1993; Pechmann and Wilbur, 1994; Pounds and Crump, 1994; Pounds et al., 1997). However, the patterns of decline at many locations suggest that epidemic disease maybe the cause (Richards et al., 1993; Laurance et al., 1996; Alford and Richards, 1997). Recent research has implicated a water-borne fungal pathogen *Batrachochytrium dendrobatidis* as the likely specific causative agent in many of these declines both in Australia and elsewhere (Berger et al., 1998; 1999). This agent is commonly known as the amphibian or frog chytrid fungus and is responsible for the disease Chytridiomycosis (Berger et al., 1999).

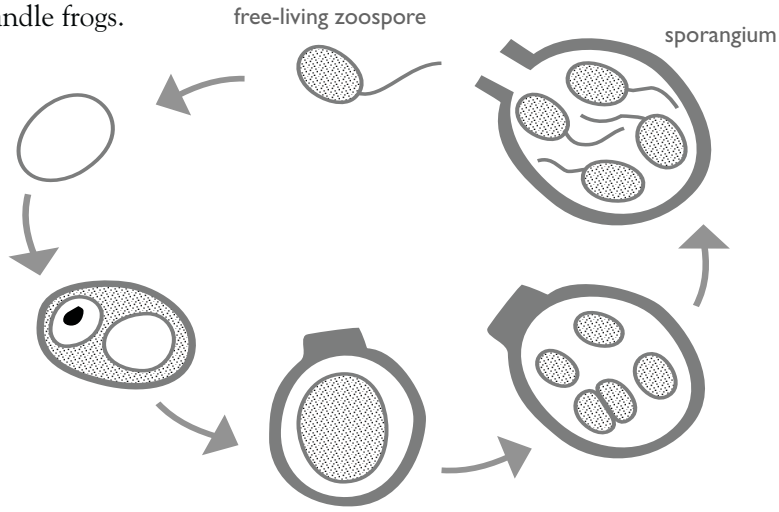
B. dendrobatidis is a form of fungus belonging to the phylum Chytridiomycota. Most species within this phylum occur as free-living saprophytic fungi in water and soil and have been found in almost every type of environment including deserts, artic tundra and rainforest and are considered important primary biodegraders (Powell 1993). *B. dendrobatidis* is a unique parasitic form of Chytridiomycete fungi, in that it invades the skin of amphibians, including tadpoles, often causing sporadic deaths with up to 100% mortality in some populations. Chytridiomycosis has been detected in over 40 species of native amphibian in Australia (Mahony and Workman 2000). However, it is not currently known whether the fungus is endemic or exotic to Australia.

The infective stage of *B. dendrobatidis* is the zoospore and transmission requires water (Berger et al.,1999). Zoospores released from an infected amphibian can potentially infect other amphibians in the same water. More research is needed on the dynamics of infection in the wild. *B. dendrobatidis* is known to be susceptible to seasonal temperature changes, dehydration, salinity, water pH, light, nutrition and dissolved oxygen (Berger et al., 1999).

1.3 Objectives

The objectives of the hygiene protocol are to:

- Recommend best-practice procedures for DECC personnel, researchers, consultants and other frog enthusiasts or individuals who handle frogs.
- Suggest workable strategies for those regularly working in the field with frogs or conducting fieldwork activities in wetlands and other aquatic environments where there is the potential for spreading pathogens such as the frog chytrid fungus.
- Provide background information and guidance to people who provide advice or supervise frog related activities.
- Provide standard licence conditions for workers engaged in frog related activities.
- Inform Animal Care and Ethics Committees (ACEC) for their consideration when granting research approvals.



Life cycle of frog chytrid fungus from infective free-living zoospore stage to sporangium (adapted from L. Berger).

2 site hygiene management

A checklist of risk management procedures and recommended standard hygiene kit is provided in Appendix 1. Please note Footnote 1 on page 4.

Individuals studying frogs often travel and collect samples of frogs from multiple sites. Some frog populations can be particularly sensitive to the introduction of infectious pathogens such as the frog chytrid fungus. Also, the arrangement of populations in the landscape may make frogs particularly vulnerable to transmission of infectious pathogens. Therefore, it is important that frog workers recognise the boundaries between sites and undertake measures which reduce the likelihood of spreading infection.

Where critically endangered species or populations of particular risk are known to occur, this protocol should be applied over very short distances ie a single site may need to be subdivided and treated as separate sites.

When planning to survey multiple sites, always start at a site where frog chytrid fungus is not known to be present before entering other infected areas.

2.1 Defining a site

Defining the boundary of a site maybe problematic. In some places, the boundary between sites will be obvious but in others, less so. Undertaking work at a number of sites or conducting routine monitoring at a series of sites within walking distance creates obvious difficulties with boundary definitions. It is likely that defining the boundary between sites will differ among localities. It may be that a natural or constructed feature forms a logical indicator of a site boundary eg a road/track, a large body of water such as a river or the sea, a marked habitat change or a catchment boundary.

As a guiding principle, each individual waterbody should be considered a separate site.

When working along a river or stream or around a wetland or a series of interconnecting ponds it is reasonable, in most instances, to treat such examples as a single site for the purposes of this protocol. Such a case would occur in areas where frogs are known to have free interchange between ponds.

Where a stream consists of a series of distinctive tributaries or sub-catchments or where there is an obvious break or division then they should be treated as separate sites, particularly if there is no known interchange of frogs between sites.

2.2 On-site hygiene

When travelling from site to site it is recommended that the following hygiene precautions be undertaken to minimise the transfer of disease from footwear, equipment and/or vehicles.

Footwear

Footwear must be thoroughly cleaned and disinfected at the commencement of fieldwork and between each sampling site.

This can be achieved by initially scraping boots clear of mud and standing the soles in a disinfecting solution. The remainder of the boot should be rinsed or sprayed with a disinfecting solution that contains *benzalkonium chloride* as the active ingredient. Disinfecting solutions should be prevented from entering any water bodies.

Rubber boots such as 'gum boots' or 'Wellingtons' are recommended because of the ease with which they can be cleaned and disinfected.

Several changes of footwear bagged between sites might be a practical alternative to cleaning.

Equipment

Equipment such as nets, balances, callipers, bags, scalpels, headlamps, torches, wetsuits and waders etc that are used at one site must be cleaned and disinfected before re-use at another site.

Disposable items should be used where possible. Non-disposable equipment should be used only once during a particular field exercise and disinfected later or disinfected at the site between uses using procedures outlined in 2.4 below.

Vehicles

Where necessary, vehicle tyres should be sprayed/flushed with a disinfecting solution in high-risk areas.

Transmission of disease from vehicles is unlikely to be a problem. However, if a vehicle is used to traverse a known frog site, which could result in mud and water being transferred to other bodies of water or frog sites, then wheels and tyres should undergo cleaning and disinfection. This should be carried out at a safe distance from water bodies, so that the disinfecting solution can infiltrate soil rather than run-off into a nearby water body.

Spraying with 'toilet duck' (active ingredient *benzalkonium chloride*) is recommended to disinfect car wheels and tyres.

Cleaning of footwear before getting back into the car will prevent the transfer of pathogens from/to vehicle floor and control pedals.

2.3 Handling of frogs in the field

The spread of pathogenic organisms, such as the frog chytrid fungus, may occur as a result of handling frogs.

Frogs should only be handled when necessary.

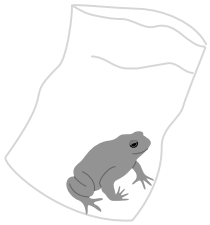
Where handling of frogs is necessary the risk of pathogen transfer should be minimised as follows:

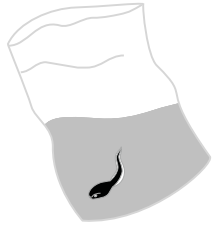
- Hands should be either cleaned and disinfected between samples or a new pair of disposable gloves used for each sample[1]. This may be achieved by commencing with a work area that has a dish containing a disinfecting solution and paper towels.
- A 'one bag – one frog' approach to frog handling should be used especially where several people are working together with one person processing frogs and others doing the collecting. Bags should not be reused.
- A 'one bag – one sample' approach to tadpole sampling should be used. Bags should not be reused.

Researchers who use toe clipping or Passive Integrated Transponder (PIT) tagging are likely to increase the risk of transmitting disease between frogs due to the possibility of directly introducing pathogens into the frogs' system. This can be minimised by using:

- Disposable sterile instruments
- Instruments disinfected previously and used once
- Instruments disinfected in between each frog

Disinfecting solutions containing *benzalkonium chloride* are readily available from local supermarkets. Some brands include Toilet Duck, Sanpic, New Clenz and Pine Clean.





[1] As a principle, this protocol assumes that not all frogs in an infected pond will be contaminated by the frog chytrid fungus. The infective load of a body of water may not be high enough to cause cross contamination of individual frogs in the same pond. Therefore care should be taken to use separate gloves and bags and clean hands for each sample, to avoid transmission of high infective loads between individuals.

Open wounds from toe clipping and PIT tagging should be sealed with a cyanoacrylate compound such as *Vetbond*© to reduce the likelihood of entry of pathogens. The DECC ACEC further recommends the application of topical anaesthetic *Xylocaine*© cream and *Betadine*© disinfectant (1% solution) before and after any surgical procedure. This should then be followed by the wound sealant.

All used disinfecting solutions, gloves and other disposable items should be stored in a sharps or other waste container and disposed or sterilised appropriately at the completion of fieldwork. Disinfecting solutions must not come into contact with frogs or be permitted to contaminate any water bodies

2.4 Disinfection Methods

Disinfecting agents for hands and equipment must be effective against bacteria and both the vegetative and spore stages of fungi. The following agents are recommended:

- Chloramine and Chlorhexidine based products such as *Halamid*©, *Halasept*© or *Hexifoam*© are effective against both bacteria and fungi. These products are suitable for use on hands, footwear, instruments and other equipment. The manufacturers instructions should be followed when preparing these solutions.
- Bleach and alcohol (ethanol or methanol), diluted to appropriate concentrations can be effective against bacteria and fungi. However, these substances may be less practical because of their corrosive and hazardous nature.

  When using methanol either:

  - immerse in 70% methanol for 30 minutes or
  - dip in 100% methanol then flame for 10 seconds or boil in water for 10 minutes

Fresh bleach (5% concentration) may be also effective against other frog pathogens such as Rana Virus.

Some equipment not easily disinfected in these ways can be effectively cleaned using medical standard 70% isopropyl alcohol wipes – *Isowipes*©.

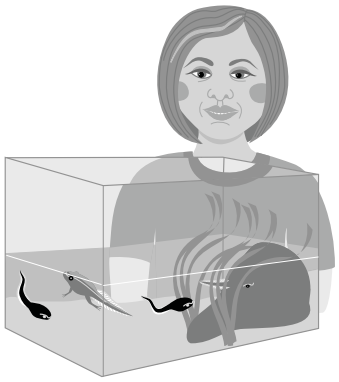
3 captive frog hygiene management

3.1 Housing frogs and tadpoles

Frogs and tadpoles should only be removed from a site when absolutely necessary.

When it is necessary for frogs or tadpoles to be collected and held for a period of time, the following measures should be undertaken:

- Animals obtained at different sites should be kept isolated from each other and from other captive animals.
- Aquaria set up to hold frogs should not share water, equipment or any filtration system. Splashes of water from adjacent enclosures or drops of water on nets may transfer pathogens between enclosures.
- Prior to housing frogs or tadpoles, ensure that tanks, aquaria and any associated equipment are disinfected.
- Tanks and equipment should be cleaned, disinfected and dried immediately after frogs/tadpoles are removed.



Careful maintenance of your enclosures will ensure a safe and hygienic environment for captive frogs and tadpoles.

When contemplating a release of captive bred tadpoles for conservation purposes a Translocation Proposal should be submitted to the DECC and pathological screening for disease should be undertaken (see also DECC Translocation Policy). Tadpoles can be tested by randomly removing 10 individuals at 6 weeks and again at 2 weeks before anticipated release. Testing could be undertaken by the pathology section at Taronga Zoo, Newcastle University, CSIRO Australian Animal Health Laboratories at Geelong and James Cook University at Townsville. Such an arrangement would need to be negotiated by contacting one of these institutions well before the anticipated release date. (see Appendix 2 for contact details)

DECC have licenced NSW Schools to allow students and/or teachers to remove tadpoles for classroom life cycle studies. They are authorised to remove individuals from only one location, each school also requires endorsement from Department of Education and Training Animal Care and Ethics Committee and comply with this protocol.

Tadpoles collected for these purposes are to be obtained from the local area of the school and are not to be obtained from DECC Reserves. As soon as tadpoles have transformed, froglets must be returned to the exact point of capture. Tadpoles from different locations are not to be mixed.

Antifungal cleansing treatments to clear tadpoles of the frog chytrid fungus are currently being trialed. In the future, such a treatment may be an added procedure required prior to froglet releases.

Detailed information on safely maintaining frogs in captivity is provided in Voigt (2001).

3.2 Tadpole treatment

In most instances:

Release to the wild of tadpoles held or bred in captivity should be avoided.

3.3 Frog treatment

The rigour with which frogs must be treated to ensure pathogens are not introduced to native populations means that any proposal for the removal of adult frogs (particularly threatened species) from wild populations should be given careful consideration.

When it is essential for frogs to be removed from the wild, the following should apply.

Individuals to be released should be quarantined for a period of 2 months and monitored for any signs of illness or disease.

Frogs must not be released if any evidence of illness or infection is detected. If illness is suspected, further advice must be sought from a designated frog recipient (Appendix 2) as soon as possible to determine the nature of the problem. Chytridiomycosis can be diagnosed in live frogs by microscopical examination of preserved toe clips or from shedding skin samples. Research is still in progress on the development of a simple technique for the detection of Chytridiomycosis and a treatment for infected frogs.

Current methods which may be used include:

- A technique for the treatment of potentially infected frogs is to place the frogs individually in a 1mg/L benzalkonium chloride solution for 1 hour on days 1, 3, 5, 9, 11 and 13 of the treatment period. Frogs are then isolated/quarantined for two months. This and other possible treatments are documented in Berger and Speare (1998)
- *Betadine*© and *Bactone*© treatments have also been used on adult frogs with some success (M. Mahony, Newcastle University pers. comm.)
- *Itraconazole*© is an expensive drug which has been used successfully (Lee Berger CSIRO Australian Animal Health Laboratory pers. comm.). Information on this method is available on the Website http://www.jcu.edu.au/school/PHTM/frogs/adms/attach6.pdf.

Frogs undergoing treatment should be housed individually and kept separate from non-infected individuals.

3.4 Displaced frogs

Displaced frogs are those native frog species and introduced Cane Toads (Bufo marinus) which have been unintentionally transported around the country with fresh produce, transported produce and landscaping supplies. Procedures to be undertaken when encountering introduced/displaced native frog species (as well as Cane Toads) are as follows.

3.4.1 Banana box frogs

'Banana Box' frog is the term used to describe several native frog species (usually Litoria gracilenta, L. infrafrenata, L. bicolor and L. caerulea) commonly transported in fruit and vegetable shipments and landscaping supplies. In the past, well meaning individuals have attempted to return these frogs to their place of origin but this is usually impossible to do accurately. There is risk of spread of disease if these frogs are transferred from place to place.

It is strongly recommended that:

Displaced Banana Box frogs should be treated as if they are infected and should not to be freighted anywhere for release to the wild unless specifically approved by DECC.

When encountering a displaced frog:

- Contact a licensed wildlife carer organisation to collect the animal. The frog should then undergo a quarantine period of 2 months along with an approved disinfection treatment.
- Post-quarantine, the frog (if one of the species identified above) may be transferred to a licensed frog keeper. All other species require the permission from DECC Wildlife Licensing and Management Unit (WLMU) prior to transfer. Licensed carer groups are to record and receipt frogs obtained and disposed of in this way.
- Licensed Frog Keepers are to list these frogs in their annual licence returns to DECC.

Frogs held by licensed frog keepers are not to be released to the wild except with specific DECC approval.

Displaced frogs may be made available to recognised institutions for research projects, display purposes or perhaps offered to the Australian Museum as scientific specimens once approval has been provided by the DECC WLMU.

Frogs are often unintentionally transported with fresh produce and landscaping supplies. They are collectively known as 'banana box' or displaced frogs.

3.4.2 Cane toads

Cane toads are known carriers of the Frog chytrid fungus and should not be knowingly transported or released to the wild.

If a cane toad is discovered outside of its normal range, it should be humanely euthanased in accordance with the recommended NSW Animal Welfare Advisory Council procedure (see Appendix 3). Care should be taken to avoid euthanasia of native species due to mistaken identity.

3.4.3 Local frog species

Frogs encountered on roads, around dwellings and gardens or in swimming pools should not be considered as displaced frogs.

Frogs encountered in these situations should be assisted off roads, away from dwellings, or out of swimming pools preferably to the nearest area of vegetation or suitable habitat.

Incidences of frogs spawning or tadpoles appearing in swimming pools should be referred to a wildlife carer/rescue organisation for assistance (see Appendix 4).

Contact the Frogwatch Helpline if you are unsure whether a frog is a local species or displaced.

An NPWS information brochure titled 'Cane Toads in NSW' provides further information on cane toads and assistance with identification of some of the commonly misidentified native species. This information is also available on the DECC website.

4 sick or dead frogs

Unless an obvious cause of illness or death is evident (eg predation or road mortality): Sick or dead frogs encountered in the wild should be collected and disposed of in accordance with the procedures described in section 4.2 below.

4.1 Symptoms of sick and dying frogs

Sick and dying frogs exhibit a range of symptoms characteristic of chytrid infection. Symptoms may be expressed in the external appearance or behaviour of the animal. A summary of these symptoms are described below. More detailed information can be found in Berger et al., (1999) or at the James Cook University Amphibian Disease website at: http://www/jcu.edu.au/school/phtm/PHTM/frogs/ampdis.htm.

Appearance (one or more symptoms)

- darker or blotchy upper (dorsal) surface
- reddish/pink-tinged lower (ventral) surface and/or legs and/or webbing or toes
- swollen hind limbs
- very thin or emaciated
- skin lesions (sores, lumps)
- infected eyes
- obvious asymmetric appearance

Behaviour (one or more symptoms)

- lethargic limb movements, especially hind limbs
- abnormal behaviour (eg a nocturnal, burrowing or arboreal frog sitting in the open during the day and making no vigorous attempt to escape when approached)
- little or no movement when touched

Great barred frog (*Mixophyes fasciolatus*) with severe Chytrid infection — note lethargic attitude and sloughing skin. Photo: L. Berger

Diagnostic behaviour tests

Sick frogs will fail one or more of the following tests:

test	healthy	sick
Gently touch with finger	Frog will blink	Frog will not blink above the eye
Turn frog on its back	Frog will flip back over	Frog will remain on its back
Hold frog gently by its mouth	Frog will use its forelimbs to try to remove grip	No response from frog

4.2 What to do with sick or dead frogs

A procedure for the preparation and transport of a sick or dead frog is given below[2]. Adherence to this procedure will ensure the animal is maintained in a suitable condition for pathological examination and assist the DECC and researchers to determine the extent of the disease and the number of species affected.

- Disposable gloves should be worn when handling sick or dead frogs. Avoid handling food and touching your mouth or eyes as this could transfer pathogens and toxic skin secretions from some frog species.
- New gloves and a clean plastic bag should be used for each frog specimen to prevent cross-contamination. When gloves are unavailable, use an implement to transfer the frog to a container rather than using bare hands.
- If the frog is dead, keep the specimen cool and preserve as soon as possible (as frogs decompose quickly after death making examination difficult). Specimens can be fixed/preserved in 70% ethanol or 10% buffered formalin.

Cut open the belly and place the frog in about 10 times its own volume of preservative. Alternatively, specimens can be frozen (although this makes tissues unsuitable for some tests). If numerous frogs are collected, some should be preserved and some should be frozen. Portions of a dead frog can be sent for analysis eg a preserved foot, leg or a portion of abdominal skin.

- The container should be labelled showing at least the species, date and location. A standardised collection form is provided in Appendix 5.
- If the frog is alive but unlikely to survive transportation (death appears imminent), euthanase the frog (see Appendix 3) and place the specimen in a freezer. Once frozen, the specimen is ready for shipment to the address provided below.
- If the frog is alive and likely to survive transportation, place the frog into either a moistened cloth bag with some damp leaf litter or into a plastic bag with damp leaf litter and partially inflated before sealing. Remember to keep all frogs separated during transportation.
- Preserved samples can be sent in jars or wrapped in wet cloth, sealed in bags and placed inside a padded box.
- Send frozen samples in an esky with dry ice (available from BOC/CIG Gas outlets).
- Place live or frozen specimens into a small styrafoam esky (available from K-Mart/Big W for approximately $2.50).
- Seal esky with packaging tape and address to one of the laboratories listed in Appendix 4.
- Send the package by courier.

Further information on sick and dying frogs is available on the Amphibian Disease Home Page at http://www.jcu.edu.au/dept/PHTM/frogs/ampidis.htm — in particular refer to *'What to do with dead or ill frogs'*.

[2] The measures described below are standard procedures and may vary slightly depending on the distance and time required to reach the intended recipient. Contact the intended recipient of the sick or dead frog prior to sending to confirm the appropriate procedure.

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Pechmann, J.H.K. and Wilbur, H.M. (1994) Putting declining amphibian populations into perspective: natural fluctuations and human impacts. *Herpetologica 50:* 64-84.

Pechmann, J.H.K., Scott, D.E., Semlitsch, R.D., Caldwell, J.P., Vitt, L.J. and Gibson, J.W. (1991) Declining amphibian populations: the problem of separating human impacts from natural fluctuations. *Science 253:* 892-895.

Pounds, J.A. and Crump, M.L. (1994) Amphibian declines and climate disturbance: the case for the golden toad and harlequin frog. *Conserv. Biol. 8:* 72-85.

Pounds, J.A., Fogden, M.P.L., Savage, J.M. and Gorman, G.C. (1997) Test of null models for amphibian declines on a tropical mountain. *Conserv. Biol. 11:* 1307-1322.

Powell, M.J. (1993) Looking at mycology with a Janus face: A glimpse of chytridiomycetes active in the environment. *Mycologia 85:* 1-20.

Richards, S.J., McDonald, K.R. and Alford, R.A. (1993) Declines in populations of Australia's endemic tropical rainforest frogs. *Pacific Conserv. Biol. 1*: 66-77.

Speare, R., Berger, L. and Hines, H. (1999) How to reduce the risk of you transmitting an infectious agent between frogs and between sites. Amphibian Diseases Home Page 22/1/99, (http://www.jcu.edu.au/dept/PHTM/frogs/ampdis.htm.).

Voight, L. (2001) Frogfacts No. 8. Frog hygiene for captive frogs (draft publication). FATS. Group. Sydney.

appendix 1

hygiene protocol checklist and field kit

The following checklist and field kit are designed to assist with minimising the risk of transferring pathogens between frogs.

Have you considered the following questions before handling frogs in the field:

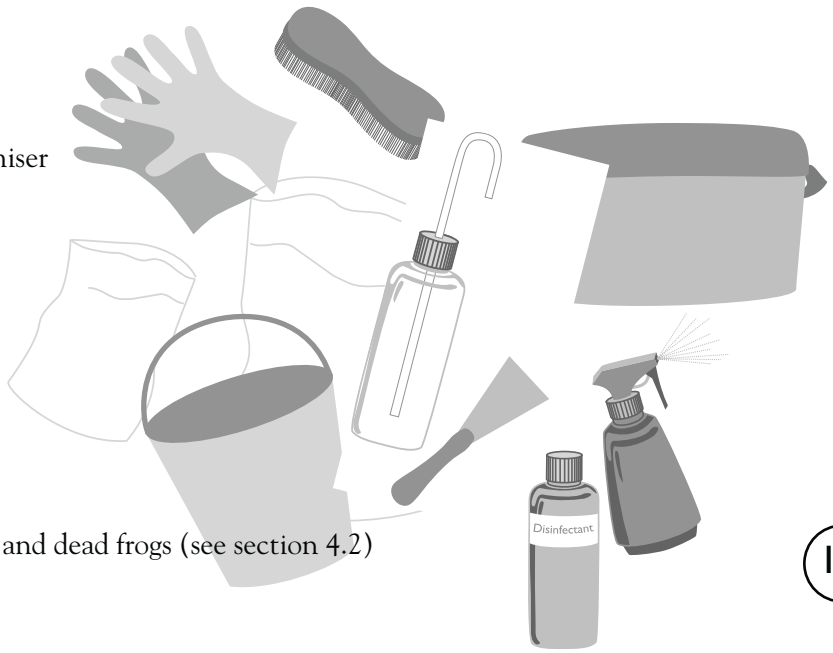
- Has your proposed field trip been sufficiently well planned to consider hygiene issues?
- Have you taken into account boundaries between sites (particularly where endangered species or populations at risk are known to occur)?
- Have footwear disinfection procedures been considered and a strategy adopted?
- Have you planned the equipment you will be using and developed a disinfection strategy?
- Are you are planning to visit sites where vehicle disinfection will be needed (consider both vehicle wheels/tyres and control pedals) and if so, do you have a plan to deal with vehicle disinfection?
- Have handling procedures been planned to minimise the risk of frog to frog pathogen transmission?
- Do you have a planned disinfection procedure to deal with equipment, apparel and direct contact with frogs?

If you answered NO to any of these questions please re-read the relevant section of the DECC Hygiene Protocol for the Control of Disease in Frogs and apply a suitable strategy.

Field hygiene kit

When planning to survey frogs in the field a portable field hygiene kit should be assembled to assist with implementing this protocol. Recommended contents of a field hygiene kit would include:

- Small styrofoam eski
- Disposable gloves
- Disinfectant spray bottle (atomiser spray) and/or wash bottle
- Disinfecting solutions
- Wash bottle
- Scraper or scrubbing brush
- Small bucket
- Plastic bags large and small
- Container for waste disposal
- Materials for dealing with sick and dead frogs (see section 4.2)



appendix 2

designated sick and dead frog recipients

Always contact the relevant specialist prior to sending a sick or dead frog. In some cases, only wild frogs will be assessed for disease. Analysis may also attract a small fee per sample.

Contact one of the following specialists to arrange receipt and analyse sick and dead frogs. Make contact prior to dispatching package:

Karrie Rose
Australian Registry if Wildlife Health
Taronga Conservation Society, Australia
PO Box 20
MOSMAN NSW 2088

Phone: 02 9978 4749
Fax: 02 9978 4516
Krose@zoo.nsw.gov.au

Diana Mendez or
Rick Speare
School of Public Health,
Tropical Medicine and
Rehabilitation Sciences
James Cook University
Douglas Campus
TOWNSVILLE QLD 4811

Phone: 07 4796 1735
Fax: 07 4796 1767
Diana.Mendez@jcu.edu.au
Richard.Speare@jcu.edu.au

Michael Mahony
School of Biological Sciences
University of Newcastle
CALLAGHAN NSW 2308

Phone: 02 4921 6014
Fax: 02 4921 6923
bimjm@cc.newcastle.edu.au

For information on frog keeping licences and approvals to move some species of displaced frog contact:

Co-ordinator, Wildlife Licensing
Wildlife Licensing and Management Unit
DECC
PO Box 1967
Hurstville NSW 1481
Ph 02 9585 6481
Fax 02 9585 6401
wildlife.licensing@environment.nsw.gov.au

For information on the possible identity of displaced frogs contact:

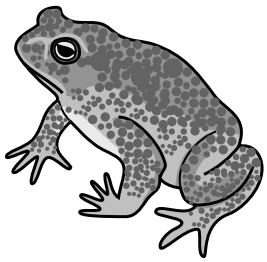
Frog and Tadpole Society (FATS)
Frogwatch Helpline

Ph: 0419 249 728

appendix 3

NSW Animal Welfare Advisory Council methodology

The NSW Animal Welfare Advisory Council procedure for humanely euthanasing cane toads or terminally ill frogs is stated as follows:



- Using gloves, or some other implement, place cane toad or terminally ill frog into a plastic bag.
- Cool in the refrigerator to 4°C.
- Crush cranium with a swift blow using a blunt instrument.

Note: Before killing any frog presumed to be a cane toad, ensure that it has been correctly identified and if outside the normal range for cane toads in NSW (north coast) that local DECC regional office is informed.

appendix 4

licensed wildlife carer and rescue organisations

Following is a list of wildlife rehabilitation groups licensed by Department of Environment and Climate Change (NSW):

Northern NSW
Australian Seabird Rescue
For Australian Wildlife Needing Aid (FAWNA)
Friends of the Koala
Friends of Waterways (Gunnedah)
Great Lakes Wildlife Rescue
Koala Preservation Society of NSW
Northern Rivers Wildlife Carers
Northern Tablelands Wildlife Carers
Tweed Valley Wildlife Carers
Seaworld Australia
WIRES branches in Northern NSW

Southern NSW
Looking After Our Kosciuszko Orphans (LAOKO)
Native Animal Network Association
Native Animal Rescue Group
Wildcare Queanbeyan
WIRES branches in Southern NSW

Sydney, Hunter and Illawarra
Hunter Koala Preservation Society
Ku-ring-gai Bat Colony Committee
Kangaroo Protection Co-operative
Native Animal Trust Fund
Organisation for the Rescue and Research of Cetaceans (ORRCA)
Sydney Metropolitan Wildlife Services
Wildlife Aid
Wildlife Animal Rescue and Care (Wildlife ARC)
Waterfall Springs Wildlife Park
Oceanworld
Wildlife Care Centre, John Moroney Correctional Centre
Koalas in Care
WIRES branches around Sydney, Hunter and Illawarra

Western NSW
Rescue and Rehabilitation of Australian Native Animals (RRANA)
RSPCA Australian Capital Territory Inc.
Wildlife Carers Network (Central West)
WIRES branches in Western NSW
Cudgegong Wildlife Carers

[4] Note: some of these organisations may not care for frogs.

appendix 5 — sick or dead frog collection form

Sender details:

name: address: postcode:

phone: (w) (h) fax: email:

Collector details: (where different to sender)

name: address: postcode:

phone: (w) (h) fax: email:

Specimen details:

record no: no. of specimens: species name: date collected:
day/month/year

time collected: sex: status at time of collection: date sent:
male/female healthy(H)/ sick(S)/ dead(D) day/month/year

location: map grid reference:
(easting) (northing)

reason for collection:

Batch details for multiple species collection:

species	no.	locality	(AMG)	date	sex	status (H/S/D)

habitat type: vegetation type: micro habitat:
eg creek, swamp, forest eg rainforest, sedgeland eg creek bank, under log, amongst emergent vegetation, on ground in the open

unusual behaviour of sick frogs:
eg lethargic, convulsions, sitting in the open during the day, showing little or no movement when touched.

dead frogs appearance:
eg thin, reddening of skin on belly and/or toes, red spots, sore, lumps or discolouration on skin

deformed frogs: dead/sick tadpoles:
eg limb(s) missing, abnormal shape or length eg numbers/behaviour

unusual appearance of egg masses: recent use of agricultural chemicals in area:
eg grey or white eggs eg pesticides, herbicides, fertilisers

other potential causes of sickness/mortality/comments/additional information:

NSW
NATIONAL
PARKS AND
WILDLIFE
SERVICE

General inquiries: PO Box A290 South Sydney 1232
Phone: 9995 5000 or 1300 361967
Fax: 02 9995 5999 **Web site:** www.environment.nsw.gov.au

Department of **Environment & Climate Change** NSW

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Appendix D - Stormwater Detention Basin Operation and Maintenance Manual

Reference Drawings:

- MA-MD-CI-DR-172001 Basin B
- MA-MD-CI-DR-172002 Basin F
- MA-MD-CI-DR-172003 Basin D

Regal Innovations Pty Ltd
ABN: 79 002 411 814

CONTRACT No: 953-213-WC

INTERMODAL LOGISTICS CENTRE AT ENFIELD

LANDSCAPING BASINS B, D AND F

Maintenance Manual

Client: Leighton Pty Ltd

Date: 31st January 2014

Revision: A

DOCUMENT CONTROL

REGISTER OF AMENDMENTS				
Rev	Date	Description of Amendments	Prepared By	Approved By
A	31-1-14		GF	RS

DISTRIBUTION REGISTER			
Rev	Date of Issue	Name of Recipient	Position / Organisation
A	6-2-14	Jason Pearson	Leighton Pty Ltd

Operation and Maintenance Manual

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Operation and Maintenance Manual

1.0 INTRODUCTION

1.1. GENERAL

Regal Innovations were appointed by Leighton Contractors Pty Ltd to carrying out of landscape and bio filtration media works to Basin B, D and F at the Intermodal Site, Enfield. Works included the installation of pits and pipe including slotted feeder pipes, construction of concrete dissipaters and spillways, gabion rock baskets, planting, soil works, jute mesh installation, hydroseeding and temporary irrigation.

The following document aims to provide an overview of the works completed with inclusion of operational and maintenance requirements to assist with the long-term success of the landscape.

1.2. SCOPE OF WORKS

The landscape works installed by Regal Innovations for the Basins B, D and F at the Intermodal Site, Enfield include the following;

- Place soil, jute and hydro-seed to batters
- Construction of shotcrete dissipaters and valve pits
- Supply Installation of 375mm, 225mm and 100mm
- Supply and installation concrete pits
- Supply and installation of the bio retention layers
- Supply and installation of new plants
- Installation of concrete half pipe to perimeter of basins
- Installation of temporary irrigation

1.3. DIRECTORY

1.3.1.CONTRACTOR

Regal Innovations Pty Ltd

Contact – Robert Stanton

249 Annangrove Rd, Annangrove NSW 2156

(02) 9670 1177

0419803914

robert@regalinnovations.com.au

1.3.2.

1.3.3.PROJECT MANAGER

Leighton Pty Ltd

Contact – Jason Pearson

0404812313

Landscape Architect

AECOM Australia Pty Ltd

Contact – Regal Not Advised

1.4. ELEMENTS

1.4.1. SOIL
- Imported soil for batters from Collins Pty Ltd
- Gravel, mulch bio retention layers from Collins Pty Ltd

1.4.2.PIPE
- Reece Pty Ltd

1.4.3.PITS
- Oz Pits

1.4.4.PLANTS
- Bluedale Nursery.

1.4.5. HYDRO SEEDING
- Grassmaster

1.4.6.JUTE
- Polyfabrics

2.0 MAINTENANCE PROCEDURES

2.1. EXTENT OF WORKS

Maintain the condition and health of the landscape works consistently to the standards outlined below so that the site is in excellent conditions and appearance AT ALL TIMES.

The extent of works comprises:

- Weed, pest and disease control;
- Rubbish removal;
- Watering of all plants
- Fertilising all plants as required;
- Replacement of plants as required
- Maintenance of Jute;
- Maintenance of the Temporary Irrigation
- Removal of temporary irrigation at the completion of the maintenance period

2.2. REPLACEMENT OF PLANTS

Replace plants that fail or are damaged with plants of the same size (or, nearest to what can reasonably be sourced), provenance and species.

2.3. PLANT MAINTEANCE

2.3.1.WATERING
Generally ensure all planting is watered via the automatic temporary watering system during the establishment period with plants receiving an average of 25 mm per week. During periods of extended heat increase the frequency of watering.

The irrigation system should also be monitored for effectiveness and correct operation. Any faults should be reported to the client and plans for rectification be made.

2.3.2.WEED AND PEST CONTROL
Eradicate all grass, weeds and pests from within the basin floor areas with approved herbicides and insecticides and remove weeds from site. Submit details of proposed herbicides / insecticides for approval prior to use. Glyphosate is to be used at the recommended rate. Pests do not attack the native grasses but monitor for rabbits, hares etc. The batters have been Hydro seeded and therefore cannot be sprayed with herbicide

Herbicides and Pesticides	Product	Application
Basin Floor — general herbicide	Roundup® or Zero®	As necessary

2.3.3.MULCHING
N/A

2.3.4.FERTILISING
Plants will not be fertilised as the Basin design allows water to enter the creek and river system

2.3.5.WEEDING GENERALLY
Continually inspect the basins for weeds and eradicate weeds by hand or approved herbicides and remove from site as necessary.

2.3.6.RUBBISH REMOVAL
Ensure that the site is kept clean, free of all litter and waste, and general debris at all times.

2.3.7.PRUNING
N/A

2.4. MAINTENANCE PROGRAM

Refer to Section 3.0

2.5. MAINTEANCNE CONTACTS

Description	Sub/Supplier	Address	Contact	Phone
All Landscape Works	Regal Innovations	249 Annangrove Road, Annangrove NSW 2156	Martyne Bird	0419992634

3.0 MAINTENANCE SCHEDULE

Activity	Frequency					Action
	D	W	2W	M	3 or 6M	
Logbook and Reports			✓	✓		Complete a logbook entry every day at site. All actions listed below require a logbook entry. Submit logbook to Casino Representative as well as on a quarterly basis a written report shall be submitted.
Plant Replacement				✓		Inspect and replace failed plants. Match species, size (original) and location of new with old.
Erosion Control			✓	✓		Inspect every two weeks and repair ground, soil immediately.
Weed and Rubbish Removal			✓	✓		Inspect and remove immediately upon observation. Leave no waste on site. Dispose of waste material at a designated Municipal Council waste disposal site.
Spraying			✓			Inspect every 2 weeks and action as necessary.
Urgent Works			✓			Complete within 2 week (7 days) of notification.
Replacment Planting			✓			Inspect every 2 weeks and remove spent flowers and dead stalks as they become apparent. .
Watering			✓	✓		Water when and where necessary to maintain an equivalent of 25mm of rain minimum per week. Do not allow soil and plants to dehydrate. Allow for prolonged rain, windy and dry periods. Requirements. Check and maintain the irrigation system

4.0 INSPECTION AND TESTING PLANS

N/A

5.0 COMMISSIONING

N/A

6.0 WARRANTIES AND GUARANTEES

All landscape works installed and supplied by Regal Innovations Pty Ltd will be warranted by Regal Innovations as per the project contract agreement.

.

7.0 APPENDICES

The following Appendices shall form part of this manual;

Appendix	Name	Status
A	Product Information Sheets	Complete
B	Warranties and Certificates	Complete
C	As Built Drawings	Complete

Appendix E – Specifications for Application and AfterCare of EcoBlanket

Specifications for the Application and Aftercare of

EcoBlanket®

&

EcoBerm®

THE HILLS

BARK BLOWER

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SUMMARY

EcoBlanket and EcoBerm together form the ideal solution to acute or chronic erosion problems. The Hills Bark Blower's system can stop erosion immediately. Microblend, the tackifier contained in the mixture will bind the EcoBlanket/EcoBerm to the ground and protect it from further degradation and loss as soon as it is applied to the site.

EcoBlanket and EcoBerm can be used separately or in conjunction with each other to assist in the rehabilitation of an environmentally damaged area. Ideally, the presence of either of these two erosion control methods should be virtually undetectable once they have served their purpose in promoting the regeneration of the natural ecosystem in the damaged area.

EcoBlanket and EcoBerm can also be used to trap silt, heavy metals and hydrocarbons before they flow into waterways. Studies have shown (refer to Appendix 1 for website links for experimental methods and discussion) that 99.7% of silt is filtered out of ground water as it moves through EcoBlanket.

EcoBlanket and EcoBerm are designed to be erosion control measures that will protect and rehabilitate damaged areas until the natural balance is restored.

Soil amelioration, replacement of topsoil, rehabilitation of native flora, erosion control and visual impact of a site are all resolved in a single process.

1. ADVANTAGES OF USING ECOBLANKET/ECOBERM OVER OTHER EROSION CONTROL SYSTEMS

The Environment

i. The Hills Bark Blower uses an *all natural* tackifier (Microblend) to bind the compost into a matrix once it is laid and encourage increased microbial activity within the organic blanket.
ii. EcoBlanket replaces the eroded top layer of soil and helps "kick start" the natural soil producing mechanisms.
iii. EcoBlanket/EcoBerm contains *no artificial substances* like plastic or oil based tackifiers.
iv. EcoBlanket/EcoBerm will not readily ignite.

The Community

v. EcoBlanket/Ecoberm provides an excellent recycling opportunity for Sydney councils and government bodies. The compost in EcoBlanket or EcoBerm is made in part from green waste from council recycling stations.
vi. Microblend is manufactured under license in Brisbane using 70% locally sourced organic material.

Delivery & Performance

vii. EcoBlanket/EcoBerm conforms to any terrain and maintains 100% contact with the ground.
viii. EcoBlanket/EcoBerm can be applied around existing trees and shrubs where necessary without compromising the integrity of the blanket and it can still maintain 100% contact with the ground.
ix. Soil additives required for amelioration of the site can be combined with the compost prior to application and applied at the same time as the EcoBlanket/EcoBerm.
x. A cover crop as well as native seed can be injected into the EcoBlanket/EcoBerm as it is being applied to the site. These are selected on a site specific basis.
xi. The blowers used to apply EcoBlanket/EcoBerm are powerful enough to deliver the compost /seed/Microblend mixture through a flexible hose for up to 150 metres. This eliminates the need for trucks or other heavy machinery to be driven onto an already damaged or eroded site.
xii. EcoBlanket/EcoBerm does not need to be removed once the cover crop and natives have established themselves.
xiii. The Hills Bark Blower guarantees an 80% coverage of the cover crop or we will repair any areas that did not meet our minimum standard. This guarantee relies on the site preparation following our guidelines so the EcoBlanket and Ecoberm are effective.

2. COMPOSITION OF ECOBLANKET & ECOBERM

EcoBlanket/EcoBerm contains some or all of the following:

i. ***Compost*** – manufactured by a local supplier; conforms to AS4454-2003 and The Hills Bark Blower's own stringent list of specifications for particle size and moisture content.
ii. ***Microblend*** – a natural tackifier/feed manufactured under license from Queensland products by a Queensland supplier to exact licensing requirements provided by Groundworks (see Section 4 for more information).
iii. ***Cover Crop*** – in most cases Japanese Millet & Rye (see Section 3 Step 4 for application rates).
iv. ***Native Seeds*** – as determined by our native seeds expert in conjunction with your specifications - SITE SPECIFIC BLEND (See Section 3 Step 4 for application rates).
v. ***Soil Additives*** – as recommended by our soil scientists (eg. lime, gypsum, water crystals etc). SITE SPECIFIC BLEND

3. THE ECOBLANKET /ECOBERM PROCESS

Step 1: SITE VISIT

Your site will be visited by the Erosion Control Consultant who will co-ordinate your project. Our consultant will take measurements, photos and notes as well as determine your requirements and expectations of the completed job.

While on site, some or all of the following will be investigated:

a. The thickness requirements of the EcoBlanket (i.e. either 25mm or 50mm depth).
b. The amount of EcoBlanket/Ecoberm that will be needed to complete the job taking rilling and existing vegetation into account.
c. Weed infestations and the proposed method of removal and/or treatment.
d. Height restrictions on native plant selections.
e. Species restrictions on native plant selections that may be necessary due to the sensitivity of local fauna. (Where possible, selections will only include those species already present in the local area).
f. Any other site specific environmental or engineering issues that may affect the success of the EcoBlanket/EcoBerm or that need to be taken into account at the time of application.
g. Stockpile site for the compost/ Delivery point for our loaders.
h. Site access for our trucks.
i. The necessity for traffic control.
j. Timing of the job for presentation of the finished site (eg. for media presentations, handover ceremonies, public access etc)

Step 2: SOIL TESTING

Soil samples should be taken from site by the client and sent to a soil testing laboratory for analysis. The Hills Bark Blower can organize this through The Sydney Environmental Soil Laboratory if needed.

Soil parameters analysed should be:
· Soil pH, Electrical Conductivity and Chloride (Cl)
· Soil Cations (Calcium (Ca), Magnesium (Mg), Sodium (Na), Potassium (K) & Aluminium (Al))
· Phosphorus (P)
· Fertility (Nitrogen (N), Phosphorus (P) & Potassium (K))
· Trace Elements (Copper (Cu), Zinc (Zn), Manganese (Mn) & Iron (Fe)
· Sulfate (SO_4)
· Texture & Soil Particle Size Analysis
· Boron (B)
· Cation Base Saturation
· Ratios Calcium to Magnesium (Ca:Mg) and % Sodium (Na) / Cation Exchange Capacity

The results will be interpreted and recommendations for amelioration will be made if required. The client will agree to and pay for a soil test regardless of whether and EcoBlanket/EcoBerm is subsequently commissioned or not.

Step 3: ARRANGEMENTS FOR AMELIORATION OF THE SOIL

The Hills Bark Blower can tailor the compost to help rectify any issues with the existing soil in consultation with the Soil laboratory.

Step 4: SEED SELECTION

The Hills Bark Blower can install the seed selection suggested by the client, or provide recommendations in consultation with our seed specialist and provider.

Step 5: SITE PREPARATION

Weed infestations and their seeds should be removed from the site before application of EcoBlanket/EcoBerm. Where commercial weed killers are employed to control infestations, The Hills Bark Blower must be notified of the type of chemical used, the date it was last applied and the amount of time recommended by the manufacturer before further plantings can take place. Where weeds have been removed manually or mechanically, consideration should be given to seeds that may have already been dropped by the weeds. EcoBlanket/EcoBerm is designed to promote the growth of desirable flora, but will also promote the growth of weed seeds if they are present on a job site. It is therefore recommended that steps be taken to ensure that weed seeds are either removed or rendered unviable.

The site should not be turned or loosened in any way before the EcoBlanket is applied. The eroded section of land should be in its raw state before application.

Step 6: APPLICATION

The Hills Bark Blower reserves the right to postpone the application process where the weather or site conditions make blowing dangerous. Saturated compost cannot be blown through our hoses.

Our well trained technicians will expertly apply the EcoBlanket/EcoBerm at the required depth by use of our low environmental impact pneumatic blowers. Other soil additives indicated by the results of the soil tests will have been mixed into the compost/seed/Microblend mixture and applied at the same time as the EcoBlanket/EcoBerm. The Hills Bark Blower has six bark blower trucks and a rock slinger truck available for your projects. Under ideal conditions, we have the capacity to treat 5000m^2 or more per day.

Step 7: AFTERCARE AND PRESENTATION OF THE SITE

Where Visual Presentation Is of High Priority

The EcoBlanket/EcoBerm should be given a heavy watering once every two days for the first week and then a light watering once a week until the site has been presented/photographed. The EcoBlanket/EcoBerm will look its best in the first three to four weeks after application.
It is not desirable for the seeds to be "tricked" into germinating at the wrong time of the year by overwatering so watering should cease as soon as the public relations exercises have been completed. Although the EcoBlanket/EcoBerm may not look visually appealing after the cover crop has died off, the natives should be allowed to germinate following natural rain events as they normally would. The native seeds included in the EcoBlanket/EcoBerm will be viable for the next 3 to 5 years and there will usually be a flush of native plant growth following every wet season as occurs in nature.

Where Visual Presentation Is a Lower Priority

The EcoBlanket/EcoBerm should be watered every two days for the first week or until the cover crop takes hold. Ideally watering should be stopped immediately after for the reasons explained above. The cover crop is important for the part its root system plays in further preventing erosion and "kick starting" the natural soil making processes again. However, aftercare of the native plants is the most important as they will be the long term inhabitants of the area and ultimately restore the natural balance.
The erosion control capabilities of EcoBlanket/EcoBerm will not be affected if the cover crop fails to germinate.

4. THE IMPORTANCE OF MICROBLEND TO ECOBLANKET AND ECOBERM

Microblend is a blend of natural and biodegradable organic ingredients that:

- Aid in immediate stabilization of compost/mulch material within the EcoBerm and EcoBlanket profile.
- Enhance the ability of the EcoBerm and EcoBlanket to bond with the soil surface.
- Provide long term nutrient resources for the proliferation of specific hydrocarbon degrading bacteria found in compost.
- Provide long term nutrient resources for the propagation of structurally enhancing fungi and actinomycetes, and bacteria that excrete soil bonding substances.
- Increase the colonization of beneficial fungi within the root zone of a Terraseeded berm and blanket to further enhance its filtration capabilities.

Microblend is a common component in all EcoBerm and EcoBlanket construction that helps standardize installation and performance. Microblend has unique characteristics that work directly with the compost materials making it possible to achieve the results that were reported initially at the San Diego State University's Soil Erosion Research Laboratory and later duplicated by the NSW Dept of the Environment and Climate Change (refer to links in Appendix 1). With all components of the system combined, we can repeat similar results from one application to the next.

5. ECOBLANKET - INFORMATION

EcoBlanket replaces the natural layer of humus that already protects our undisturbed soils. Injected with Microblend, the EcoBlanket has increased structural integrity along with the ability to aid in the degradation of hydrocarbons that are found on many construction sites. EcoBlanket is easily installed in a one step, low impact pneumatic process that can conform to just about any terrain without any further unnecessary removal or destabilization /compaction of existing substrates.

In certified Erosion Control testing facilities (see Appendix 1) EcoBlanket has shown to be over 99% effective in reducing soil loss as an erosion control measure. These test results show that EcoBlanket compares with the highest rated Best Management Practices in the industry for erosion control in similar conditions.

As an erosion control measure, EcoBlanket completely covers the denuded soil with a matrix of natural organic material active with beneficial microbes. Through pneumatic application, the EcoBlanket conforms to the varied contours of the soil surface providing an interlocking blanket with the soil beneath, holding soil particulates in place.

For establishment of permanent vegetation, whether it is grasses, wildflowers or native plants, the EcoBlanket can be injected with seed during the applications process. The EcoBlanket material combined with Microblend makes an ideal media for seed germination while providing immediate

erosion control.

EcoBlanket uses no plastic materials in its construction. The fibrous matrix it forms with the help of the bonding capabilities of Microblend give the necessary structure needed without non-biodegradable reinforcements or netting. Made with recycled organics, the compost blend can be used as an earth friendly soil amendment at the completion of a project, or left as a permanent stabilizing organic layer to work into the topsoil over time.

EcoBlanket also establishes a buffer to absorb rainfall energy, slows velocity of water run off allowing natural percolation of rain water into soil, improves existing soil structure and biology and can be applied to remote and difficult to reach areas.

6. ECOBLANKET – NOTES FOR ENGINEERS AND ARCHITECTS

Description

EcoBlanket is an erosion control device that utilizes a specifically sized mulch/compost filtering material, pneumatic installation and biological/structural additive system that has been laboratory tested to be over 99% effective*. EcoBlanket controls erosion by providing a 50mm mulch/compost blanket with 100% soil contact that eliminates splash, sheet and rill erosion.

Conditions Where Practice Applies

EcoBlanket is used almost anywhere that soil has been disturbed, denuded and construction activity has taken place and temporary or permanent stabilization is desired.

Design Criteria

EcoBlanket used as an erosion control practice utilizes a blown on surface blanket combined with proper depth and placement that conforms to the contour of the soil. Unlike most rolled on blankets, EcoBlanket has 100% contact with the soil surface which keeps runoff from moving under the erosion blanket, and instead forces water to filter through it. An important consideration in this filtration process is protecting the upper portion of the blanket from channeling rills. Combining EcoBerms with proper placement or overlapping the EcoBlanket into existing vegetation will keep rilling from starting at the top of the slope. EcoBlanket depth should only be modified based on specific site (eg. soil characteristics, existing vegetation and climatic conditions, as well as particular project related requirements). The severity of slope grade, as well as slope length will also influence the depth of application or combined use with EcoBerms.

Depth Recommendation

Recommended depth of application for the EcoBlanket is 50mm on slopes of 1:2 or less. A 25mm

blanket may be substituted, at the discretion of the Engineer, on slopes of 1:3 or less when the Isoerodent Factor (R Factor) for the project area does not exceed 120.

Vegetation

Seed may be injected at time of application with a pneumatic blower truck.

Material

The compost portion of the EcoBlanket shall be derived from well-decomposed organic matter source produced by controlled aerobic (biological) decomposition that has been sanitized through the generation of heat and stabilized to the point that it is appropriate for this particular application.

Performance

The addition of EcoBerms and/or temporary or permanent vegetation shall be applied/established when necessary, along with other appropriate structural measures and control, for additional erosion and sediment control. All existing and foreseeable future conditions that affect the work inside and outside the site limits must be acknowledged as the client's complete responsibility.

7. ECOBERM - INFORMATION

The EcoBerm eliminates the need for plastic silt fencing. In a certified erosion control testing facility (see Appendix 1), EcoBerm has shown to be over 99% effective in reducing soil loss. The test results show that EcoBerm compares with the highest rate Best Management Practices in the industry under similar conditions. EcoBerm not only maintains a low cost for installation, but does not require removal or disposal, nor does it incur expenses associated with that extra process.

The patented BermBuiilder combined with a single step pneumatic application and Microblend additive creates a dependable system that ensures the berm meets specific dimensions and is installed correctly with 100% ground contact.

An independent lab (see Appendix 1) has shown that the combination of Microblend and the compost/mulch used to make EcoBerms greatly enhances the ability of the material to degrade hydrocarbons as water flows through its three dimensional matrix. EcoBerm uses no plastic materials in its construction. The fibrous matrix it forms with the help of the bonding capabilities of Microblend give the necessary structure needed without non-biodegradable reinforcements. Made with recycled organics, the compost/mulch blend can be used as an earth friendly soil amendment at the completion of a project. EcoBerm may be seeded if left as a permanent part of the surrounding landscape. It conforms to all terrain conditions and no ditching, staking or reinforcement is necessary. There is only a very low impact to the surrounding area physically, visually, and environmentally when EcoBerm is used.

8. ECOBERM – NOTES FOR ENGINEERS AND ARCHITECTS

Description

EcoBerm is a sediment-trapping device that utilizes a specifically sized mulch/compost filtering material, pneumatic installation using a berm forming device, and biological/structural additive system that has been laboratory tested to be over 99% effective*. EcoBerm reduces sediment being transported off site by filtering runoff and dissipating small rills of flow into broader flow with weaker force.

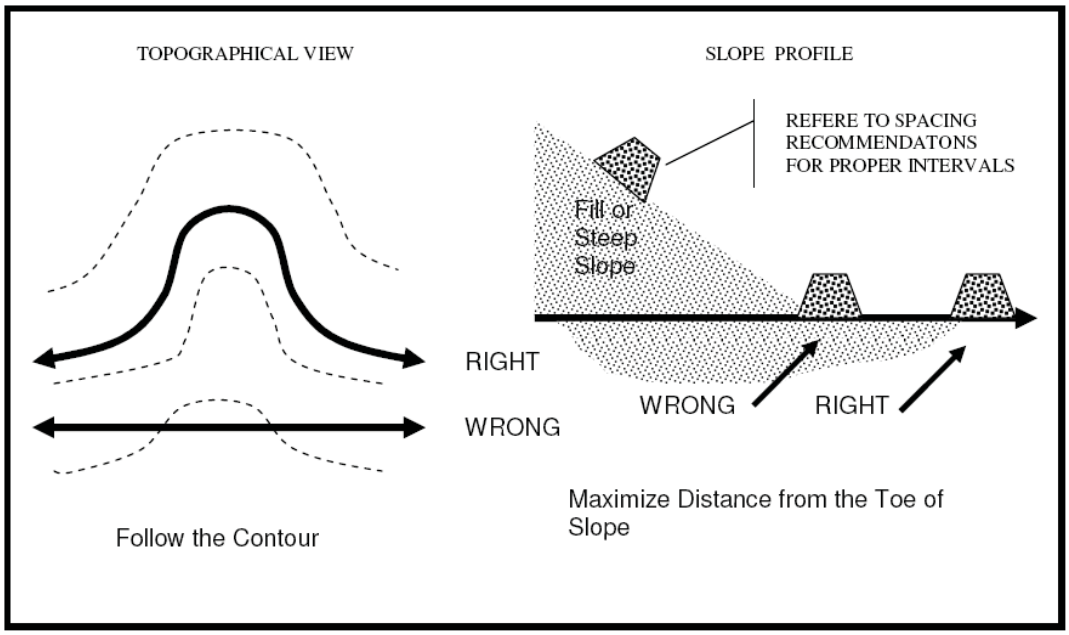
Conditions Where Practice Applies

EcoBerm is used where runoff occurs as sheet flow or where flow through small rills can be converted to sheet flow.

Design Criteria

EcoBerm used as a sediment control practice utilizes the filtering berm combined with the proper placement that conforms to the topography of the site. Unlike silt fence, which relies on settling, EcoBerm actually filters the runoff water as it passes through the berm. An important part of this filtration process is making sure that the runoff is intercepted on the contour to ensure that sheet flow is not channeled into concentrated flow. EcoBerm dimensions should be modified based on specific site (e.g., soil characteristics, existing vegetation) and climatic conditions, as well as particular project related requirements. The severity of slope grade, as well as slope length, will also influence the size and location of the EcoBerm and number of EcoBerm placements.

Figure 1: Profiles of EcoBerms



Level Contour

For best filtration, EcoBerm® should be placed on the level contour of slope so that flows are dissipated into uniform sheet flow which has little energy for transporting sediment. EcoBerm® should never channel runoff, which will result if it is placed up and down slopes rather than on the level contour.

Size Recommendations

EcoBerm shall be constructed at a minimum of 30cm high by 60cm wide. For maximum water filtration ability or for steeper slopes, construct a minimum of 45cm high by 90cm wide EcoBerm in combination with an EcoBlanket. In general, the base of the berm should be twice the height of the berm.

Flow Around Ends

To prevent water from flowing around the ends of the EcoBerm each end must be constructed up-slope so that the ends are at a higher elevation.

Vegetation

EcoBerm may be vegetated for a more permanent placement such as wetlands and natural areas.

Material

The compost portion of the EcoBerm shall be derived from well-decomposed organic matter source produced by controlled aerobic (biological) decomposition that has been sanitized through the generation of heat and stabilized to the point that it is appropriate for this particular application.

Performance

On highly unstable soils, use EcoBerms in conjunction with other appropriate structural measures and controls. EcoBerm is intended as a sediment control device for sheet flow only, under tested parameters. All existing and foreseeable future conditions that affect the work inside and outside the site limits must be acknowledged as the client's complete responsibility.

9. THE HILLS BARK BLOWER'S ABILITY TO APPLY ECOBLANKET/ECOBERM

The Hills Bark Blower has the following Blower trucks and spreading equipment:

	Blower Unit	Truck
1.	TM 20 S1 Bark Blower	Isuzu FVZ series Truck
2.	O-Phee Tonne Blower Trailer	KenworthT401
3.	RB - 20 Express Blower	KenworthT385
4.	RB - 20HD Express Blower	Nissan UD CW445 Prime Mover
5.	Kenworth K100 Twin Steer	Original Build
6.	RB - 20 Express Blower	Nissan UD Prime Mover
7.	TM 70	Isuzu EXY 425 18 Speed
		Kenworth K104 Truck and Dog

Rockslingers

1. Conveyor Application System Eight Wheeler

We have on site loading capabilities

*All vehicles have log books that are available on request

The Hills Bark Blowers staff have the following qualifications:

ALL TRUCK CREWS have green cards, personal safety equipment (including steel capped boots, long sleeved shirts & trousers, hats, eye & ear protection, face masks & gloves, high visibility clothing).

Our crews will attend site specific inductions as required.

SELECTED STAFF have first aid certificates, height training and harness course completion, elevated work platform tickets, loader tickets, HR or MC licenses.
The Hills Bark Blower has Workplace Health & Safety documents available on request.

10. THE HILLS BARK BLOWER COMPANY DETAILS

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ABN: 12 075 880 652

Association Memberships
International Erosion Control Association Member
Green Roofs Australia Association Major Sponsor/Member
Waste Management Association Member
Compost NSW Member
Landscape Contractors Association Member

APPENDIX 1 – Links to Scientific Methods for Testing Effectiveness of Compost Blankets and Subsequent Discussion

Study by San Diego University

http://erosionlab.sdsu.edu/ProfileProductsMBFM.pdf

Study by NSW Dept of the Environment and Climate Change–Summary Sheet

http://www.environment.nsw.gov.au/resources/200760_org_controllingerosion.pdf

Study by NSW Dept of the Environment and Climate Change–Full Scientific Method and Discussion

http://72.14.253.104/search?q=cache:QyZwCgkaa14J:https://www.dec.nsw.gov.au/resources/200758_org_recorgcompblankets.pdf+compost+blanket+nsw&hl=en&ct=clnk&cd=1&gl=au

APPENDIX 2 – Microblend MSDS

MATERIAL SAFETY DATA SHEET

MSDS – Microblend™

SECTION 1

Rexius Forest By-Products Inc
1275 Bailey Hill Road
Eugene, OR 97402

Date Issued: February 1, 2002
Emergency Phone Number: (541) 342-1835
Toll Free For Information: (888) 473-9487

SECTION 2 – Hazardous Ingredients

Blend of organic sucrose, hydrophilic powder from natural sources, and seed meal from the genus gossypium
Not considered hazardous
(Known exposure Limits for organic sucrose): PEL = 15mg/m3 (total dust) or 5 mg/m3 (respirable dust)
LD30 = 29.7 g/kg, rat; = 14.0 g/kg, mouse

SECTION 3 – Physical/Chemical Characteristics

Boiling Point:	Solid – NA
Vapor Pressure (mm Hg):	Solid – NA
Vapor Density (Air = 1):	Solid – NA
Specific Gravity (H20 = 1):	Solid – NA
Melting Point:	180° C
Evaporation Rate (Butyl Acelate = 1)	Solid – NA

Appearance and Odor: brownish white powder like material with sweet bean like odor

SECTION 4 – Fire and Explosion Hazard Data

Flash Point: At concentrations of 0.045 gm/L (45 gms/m3) or higher, airborne sucrose dust accumulations are explosive. Airborne sucrose dust accumulation ignition temperature is 370°F (NFPA Class3).

Fire: NA

Fire fighting Instructions: Wear self-contained positive pressure chemical apparatus and full fire fighting protective clothing. Remove container(s) from area if possible. Use extinguishing media appropriate for surrounding fire and materials.

Unusual Fire and Explosion Hazards: Has a potential explosion hazard like all dry powder polysaccharides if dust concentration in air is too high. Also slippery when wet.

Extinguishing Media: Water, Carbon Dioxide, Dry Chemical, or Foam

SECTION 5 – Reactivity Data

Stability: Stable

Conditions to avoid: Carbon Dioxide and Carbon Monoxide may form when heated to decomposition, or heated with strong, concentrated alkalis, acids, or strong oxidizing agents. This reaction is exothermic. Avoid contact with water prior to use.

Decomposition: Thermal decomposition, at temperatures in excess of 367∞F, may release acrid fumes and smoke.

Polymerization: Will not occur

APPENDIX I

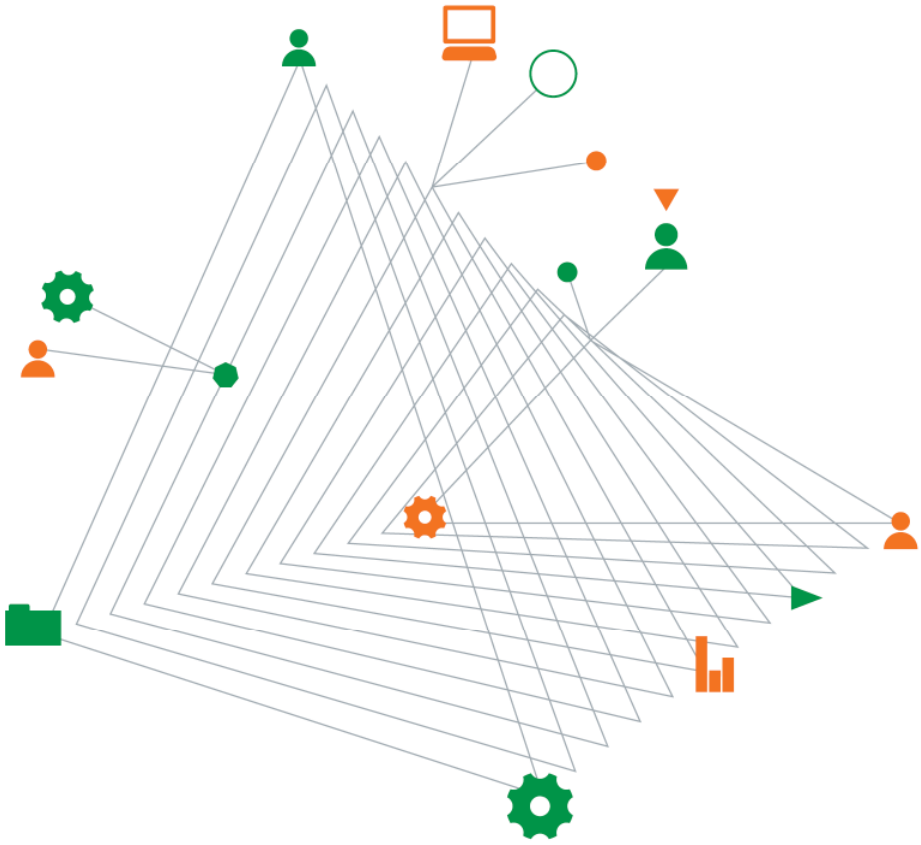
Contaminated Soil Disturbance Management Plan

Goodman Property Services Pty Ltd

Enfield Intermodal Logistics Centre, Contaminated Soil Disturbance Management Plan – Precinct E

2 Mainline Road, Strathfield South NSW

16 January 2020



Experience comes to life when it is powered by expertise

Enfield Intermodal Logistics Centre, Contaminated Soil Disturbance Management Plan – Precinct E

Prepared for
Goodman Property Services Pty Ltd

Prepared by
Coffey Services Australia Pty Ltd
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16 January 2020

754-SYDEN230542-R02_V4

Quality information

Revision history

Revision	Description	Date	Author	Reviewer
R02	Final	17/06/2019	S. Hay	M. Locke
R02_V2	Final following comments from the Auditor	24/06/2019	S. Hay	M. Locke
R02_V3	Final following design changes to development	30/09/2019	S. Hay	M. Locke
R02_V4	Final following design changes to development	16/01/2020	S. Hay	M. Locke

Distribution

Report Status	No. of copies	Format	Distributed to	Date
R02	1	PDF	Goodman Property Services	17/06/2019
R02	1	PDF	Goodman Property Services	24/06/2019
R02	1	PDF	Goodman Property Services	30/09/2019
R02	1	PDF	Goodman Property Services	16/01/2020

Abbreviations

ACM	Asbestos-containing Materials
AHD	Australian Height Datum
AMP	Asbestos Management Plan
ARCP	Asbestos Removal Control Plan
BTEX	Benzene, toluene, ethylbenzene and xylene compounds
CLM	Contaminated Land Management
COC	Chain of Custody
CoPC	Chemical of Potential Concern
CSDMP	Contaminated Soil Disturbance Management Plan
DP	Deposited Plan
DQIs	Data quality indicators
DQOs	Data quality objectives
LARC	Licenced Asbestos Removal Contractor
m BGL	metres Below Ground Level
NATA	National Association of Testing Authorities
NSW EPA	New South Wales Environment Protection Authority
PAH	Polycyclic Aromatic Hydrocarbons
PID	Photo Ionisation Detector
POEO	Protection of the Environment Operations
QA/QC	Quality Control/Quality Assurance
PPE	Personal Protective Equipment
RPE	Respiratory Protective Equipment
TRH	Total Recoverable Hydrocarbons
UPSS	Underground Petroleum Storage System
UFP	Unidentified Finds Protocol
VOC	Volatile Organic Compounds

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1. Introduction

Coffey Services Australia Pty Ltd (Coffey) was engaged by Goodman Property Services Pty Ltd (Goodman) to prepare this Contaminated Soil Disturbance Management Plan (CSDMP) for the proposed redevelopment of Precinct E, at NSW Ports (Ports) Enfield Intermodal Logistics Centre (Enfield ILC), located at 2 Mainline Road, Strathfield South, NSW 2163.

The location of Enfield ILC and Precinct E are shown on Figure 1 and Figure 2, and the property information is summarised in Table 2 (Section 6). A copy of the architectural design plans are supplied in Appendix A.

In this document the term 'site' refers to the land that is Precinct E.

2. Background

The Enfield ILC land was formerly used by the State Rail Authority (SRA) of NSW for marshalling and maintenance of rail cars and locomotives, as well as sidings for rail and goods, for over 70 years from the 1920's until the 1990's. Enfield ILC currently includes the Enfield Intermodal Terminal (IMT), an existing warehouse and tarpaulin shed, a Southern Precinct, and 30 hectares of remaining developable land zoned IN1 General Industrial.

Coffey understands that:

- The Enfield ILC will be redeveloped in nine precincts (Precincts A to I) for commercial/industrial uses, primarily associated with logistics. Precinct boundaries are shown on Figure 2. The proposed development in Precinct E is discussed in Section 3.
- Development consent (Ref: MP05_0147) was granted for the redevelopment of Enfield ILC on 5 September 2007 which included the construction of seven warehouses (with a total footprint area 109,300m^2. A modification (MOD14) to the existing development approval has been prepared by Urbis Pty Ltd (Urbis)[1] and is currently under assessment by NSW Department of Planning and Environment (DP&E). MOD 14 seeks to modify the Approval to reflect the architectural plans. This will entail a modification of built form parameters including site layout, road alignments and building footprints within the warehouse and commercial precincts to create 13 warehouses encompassing approximately 125,000 m^2, as well as approval to increase the building heights to a maximum of 13.7 m. An estimated 52,425 m^3 of imported fill is anticipated to be required to create level warehouse pads and minimise disturbance of contaminated materials across the precincts.
- Previously, asbestos-impacted soil considered to included both bonded and friable asbestos has been identified in fill soil and in three stockpiles (as shown on Figure 2) situated at the site. The stockpiles (denoted as SP1, SP2 and SP3) were generated as part of construction works for additional rail sidings at Enfield ILC. The works included the excavated of contaminated soil in a portion of the site where the additional rail sidings and temporary batters were to be constructed. As part of the construction works, approximately 8,566 m^3 of asbestos-impacted material and pre-existing capping material was excavated to accommodate the installation of new rail sidings and adjacent extension area. This material was transported, stockpiled and capped in three separate stockpiles (SP1 to SP3) within Precinct E. Stockpiles SP1 and SP2 were capped with 100 mm of clean existing capping material and seeded with grass. Stockpile SP3 was stabilised with geo-

[1] http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8731

textile fabric and seeded with grass. A detailed history of the site is provided in the Coffey 2019 Phase 1 Environmental Site Assessment (Coffey Ref: SYDEN230542-R02).

- Tom Onus of Ramboll Australia Pty Ltd (Ramboll) (formerly Environ) has been engaged by Goodman, as the NSW EPA Accredited Site Auditor, to prepare Section B (prior to construction) and Section A (prior to operation/occupancy) Site Audit Statements (SAS) and Site Audit Reports (SAR) to facilitate redevelopment and intended use of the Enfield ILC.

3. Proposed Development

Coffey understands that the development in Precinct E will comprise construction of two industrial warehouses with offices, shared access driveways and car parking areas, landscaping and paths.

Subsurface structures introduced as part of the proposed development will include footings for buildings, retaining walls and fences, services easements and stormwater drainage. To achieve design levels, the proposed development will include cut and fill and importation of clean material as summarised in Table 1.

Table 1: Summary of Proposed Earthworks Volumes

Item	Precinct E
Total Cut	13,176 m^3
Total Fill	24,722 m^3
Balance Required	11,546 m^3

The volumes in Table 1 have been extracted from the Bulk Earthworks Cut and Fill Plan (Appendix B). The volumes are estimate and assume no top soil stripping is required, and do not take into account materials that may be removed during earthworks. The above estimates also do not account for materials used in landscaped areas.

Fill remaining in-situ (including stockpiled material) is proposed to be capped with clean imported material and pavements/landscaping (capping). A geotextile indicator marker layer is proposed to be installed on top of the fill remaining in situ to mark the presence of ACM contaminated soil beneath. Proposed capping thicknesses are discussed in Section 8.

A copy of the Architectural and Landscape Plans are provided in Appendix A, and Civil Plans are provided in Appendix B.

4. Objectives and scope of work

The objectives of this CSDMP are to:

- Outline how asbestos-contaminated soil is proposed to be capped onsite.
- Provide a validation strategy for the proposed capping works.
- Provide a procedure to control the risk of asbestos exposure during earthworks.
- Provide a procedure to manage unexpected contamination finds during proposed earthworks.
- Outline how asbestos-contaminated soil is proposed to be managed following capping and redevelopment.

The CSDMP is intended to be a dynamic document that should be revised where necessary throughout the course of the project to reflect changes to the work environment or method of excavation that could result in a change to asbestos exposure risk factors and associated asbestos controls. As soon as reasonably practicable, after such a change is identified, the CSDMP shall be revised. Exposure risks associated with asbestos are outlined in Section 7.

5. Technical and regulatory framework

This CSDMP has been developed in general accordance with the following legislation, industry standards, codes of practice, and guidance documents, where relevant:

- NSW Work Health and Safety (WHS) Act 2011 (WHS Act 2011)
- NSW WHS Regulation 2011 (WHS Regulation 2017)
- Contaminated Land Management (CLM) Act, 1997 (CLM Act 1997)
- CLM Amendment Act 2008
- Protection of the Environment Operations (POEO) Act 1997 (POEO Act 1997)
- POEO (Waste) Regulation 2014 (POEO Regulation 2014)
- National Environment Protection Council (NEPC) Act 1994 (NEPC Act 1994)
- National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure, 1999 (amended April 2013) (amended ASC NEPM)
- Safe Work NSW How to Manage and Control Asbestos in the Workplace Code of Practice 2016
- Safe Work NSW How to Safely Remove Asbestos Code of Practice 2016
- NSW Environment Protection Authority (EPA) State Environmental Planning Policy 55 – Remediation of Land, 1998 (SEPP 55)
- NSW EPA Waste Classification Guidelines: Part 1 – Classifying Waste, 2014 (NSW EPA Waste Classification Guidelines 2014)
- NSW EPA Guidelines for the NSW Site Auditor Scheme (3rd edition) October 2017
- CRC Care Technical Report No. 10, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, 2011 (CRC Care 2011)
- WorkCover NSW (2014) ‘Managing Asbestos in or on Soil’, March 2014
- NSW Office of Environment and Heritage (OEH), Guidelines for Consultants Reporting on Contaminated Sites, 2011 (OEH 2011)
- Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC:3003(2005)]
- AS 4964-2004 Method for the qualitative identification of asbestos in bulk samples
- AS 2985-2009 Workplace atmospheres - Method for sampling and gravimetric determination of respirable dust
- AS 3640-2009 Workplace atmospheres - Method for sampling and gravimetric determination of inhalable dust
- AS 1319-1994 Safety signs for the Occupational Environment
- AS/NZS 1716 – 2012 Respiratory Protective Devices
- AS/NZS 1715 – 2009 Selection, use and maintenance of respiratory equipment.

6. Site Information

Locality Details

Table 2: General Site Information

Title Identification:	Part of Lot 100 in DP1251048
Address	Enfield ILC, 2 Mainline Road, Strathfield South NSW
Local Government Authority	Strathfield Municipal Council.
Owner	NSW Ports.
Precinct Area:	2.19 ha
Current Land Use:	Vacant, car park
Current Zoning:	IN1 (General Industrial) under Strathfield Local Environmental Plan 2012

6.1. Site Description

The following site description is based on observations made during a walkover of the site on 6 May 2019 by a suitably experienced Environmental Consultant from Coffey.

- The site was largely vacant with the exception of the western portion of Precinct E where several demountables and containers were located. The western portion of the site used as an access road, car-park and site offices for the Precinct C redevelopment located immediately south of Precinct E.
- The western portion of the site was noted to be flat before stepping down at a medium to steep gradient eastward towards Cosgrove Road.
- Two large stockpiles were noted in the southern portion of the site, one in the western portion and the second situated along the eastern boundary. A third large stockpile was noted in the north-eastern portion of the site.
- The surface of the western portion of the site was covered with aggregate. Grass covered areas were noted along the eastern boundary and bare soil was exposed in the central portion of the site, amongst areas that were heavily vegetated. Additional heavily vegetated areas were noted running north to south through the centre of the site, between the two southern stockpiles with a mature stand of trees present. The central eastern portion of the site was also heavily vegetated with a mixture of large trees and very dense ground cover.
- An underground high-pressure gas pipe was marked out on site which was inferred to be aligned through the centre of the site on a north-northwest to south-southeast orientation.
    - Based on information provided by Goodman, it is understood that the high pressure gas pipe is to be decommissioned by the asset owner (Quenos), however at the time of issuing this management plan, details of the decommissioning had not been finalised.
- A fragment of fibre cement debris suspected of containing asbestos was identified in surface fill in the north-western portion of the site (away from stockpiled material). The fragment was approximately 5 – 10 cm in diameter, angular in appearance and noted to be in relatively good condition with only minimal weathering.
- A small dangerous goods store was located in the western portion of the site immediately north of the site offices and was understood to be part of the Precinct C redevelopment with flammable gas cylinders stored in a locked cage and flammable liquids stored in a self-bunded metal cabinet. No visible staining or odours were noted in the vicinity the chemical storage area.

- A small kiosk substation was observed in the north-eastern portion of the site bordering Cosgrove Road.
- A driveway was present leading to a small building (off-site) in the northern extent of the site with a portion of disused rail line observed bisecting the driveway. Two shipping containers were situated in the northern extent of the driveway however this area was inaccessible at the time of the site walkover.
- No infrastructure consistent with underground petroleum storage systems (UPSS) including fill and dip points, vents or gattic lids were identified on Precinct E during the site walkover. Furthermore, visual or olfactory signs of volatile contamination (i.e. stockpiled/discarded waste drums, surface stains, unusual odours) were not noted during the site walkover.
    - Located on the northern side of the maintenance building (approximately 30-50 m west of Precinct E) was a small shed with an exterior sign reading "Wheel Lathe Waste Oil Tank 2,500 L", however this portion of the site could not be accessed during the walkover. A phone call was placed to Group Property Manager regarding the tank who said it was part of train inspection bay infrastructure and was installed at some point prior to 2009. The Group Property Manager indicated that he was not aware of any spills or leaks having occurred in relation to the waste oil tank.

Photographs taken during the site walkover are presented in Appendix C.

7. Plausible Contaminant Linkages

Asbestos in soil, if not managed appropriately could pose a potential unacceptable risk to human health during construction or future use of the site. For a health risk to be present, there must be a plausible pollutant linkage between the source and a receptor by means of a transport mechanism (pathway).

7.1. Definitions of asbestos and asbestos contamination

Asbestos can occur in a range of forms, sizes and degrees of deterioration.

The WHS Regulation 2017 provides the following terminology for describing types of asbestos:

- Asbestos – *'The asbestiform varieties of mineral silicates belonging to the serpentine or amphibole groups of rock-forming minerals, including actinolite asbestos, grunerite (or amosite) asbestos (brown), anthophyllite asbestos, chrysotile asbestos (white), crocidolite asbestos (blue) and tremolite asbestos'.*
- ACM – *'Any material or thing that, as part of its design, contains asbestos'*.
- Friable Asbestos – *'Material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contains asbestos'*.
- Non-friable asbestos – *'Material containing asbestos that is not friable asbestos, including material containing asbestos fibres reinforced with a bonding compound'*.

The amended ASC NEPM uses the following terminology for asbestos contamination in soil:

- Bonded ACM – ACM which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin (e.g. asbestos fencing and vinyl tiles). This term is restricted to material that cannot pass a 7mm sieve.
- Fibrous asbestos (FA) – friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand

pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).

- Asbestos fines (AF) – free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7mm sieve.

7.2. Forms of Asbestos

Based on the reviewed information, there is the potential for the following types of ACM to be present within fill in Precinct E:

- Friable and bonded (non-friable) asbestos, as defined in the WHS Regulation 2017
- Bonded asbestos-containing material (ACM), asbestos fines (AF), and fibrous asbestos (FA), as defined in the amended ASC NEMP.

Following a discussion with Goodman, it has been assumed that all fill across the site beneath the existing surface is impacted with asbestos.

7.3. Potential asbestos exposure pathway and toxicity

The air inhalation pathway is the relevant route of exposure to asbestos. Depending on the level and duration of exposure, inhalation of asbestos fibres can cause:

- Asbestosis
- Asbestos-related pleural abnormalities
- Lung and laryngeal carcinoma
- Malignant mesothelioma of the pleura or peritoneum.

The Australian population is invariably exposed to low levels of asbestos in the air we breathe every day which is referred to as an ambient background concentration. Ambient or background air usually contains between 10 and 200 asbestos fibres in every 1000 litres (or cubic metre) of air (equivalent to 0.01 to 0.20 fibres per litre of air)[2].

7.4. Potential receptors and transport mechanisms

Based on the proposed redevelopment and commercial/industrial use of the site, potential receptors to asbestos contaminated soil are considered to comprise:

- Future commercial users and visitors to the site
- Future landscape maintenance workers
- Construction/intrusive maintenance workers
- Users of land surrounding the site.

Exposure to asbestos can occur when ACM is disturbed, and asbestos fibres are released into the air. Excavation during construction, future ground maintenance events, and heavy rainfall events may

[2] *Environmental Health Standing Committee (enHealth), Asbestos: A guide for householders and the general public, Australian Health Protection Principal Committee, Canberra, 2013*

potentially expose buried ACM. Release of asbestos fibres from ACM impacted soil may occur as a result of (including but not limited to):

- Weathering
- Mechanical or manual excavation during construction and future maintenance work
- Mowing/wiper snipping.

8. Capping

8.1. Objectives

The objectives of the capping works are to mitigate potentially unacceptable risks to human health from asbestos-contaminated soil, in light of the proposed development.

8.2. Summary of Earthworks

It is understood that earthworks will include the following steps:

1. Removal of vegetation, to be disposed of off-site.
2. Cut and fill of surface material and ACM contaminated soil including:
    - Excavation, temporary stockpiling and/or relocation ACM impacted soil.
    - Excavation of service trenches/pits and footings.
3. Installation of geotextile marker layer on existing fill including within service trenches/pits and footings.
4. Installation of services structures (i.e. pipes/conduits) and retaining work.
5. Filling of service trenches/pits using approved imported material.
6. Filling of Precinct E to achieve design levels by compacting, proof rolling and verification testing of each imported backfill layer.
7. Construction of slabs and installing pavements/landscaping.

8.3. Geotextile Marker Layer

Asbestos contaminated soil will be covered with a geo-textile barrier to provide a warning of the presence of underlying soil contamination. The geo-textile marker layer shall meet the following conditions:

- Water permeable;
- High visibility;
- Rot-proof and chemically inert;
- High tensile strength;
- Coverage of contaminated area and 0.5 m beyond boundary if practical;
- Parallel sheets to be fixed together or overlap by 20 cm.

A common geo-textile fabric used on construction sites in NSW is mastaTEX™ Orange.

8.4. Proposed Capping Thickness and Materials

As discussed in Section 3, the geotextile marker layer is proposed to be covered with imported soil, finished with slabs for the proposed buildings, pavements for driveways, pedestrians and carparking, and landscaping material.

In paved areas, the capping is proposed to be a minimum of **0.5m thick**, which will include the following slab/pavement thicknesses as supplied by Goodman:

- Warehouses and other hardstand areas: 160mm – 200mm thick concrete slab
- Carparks and roads: 180mm thick concrete slab / bitumen overlay
- Pedestrian Pavements: 110mm thick concrete

Pavement surfaces will be underlain by a suitable subbase material to provide minimum thickness.

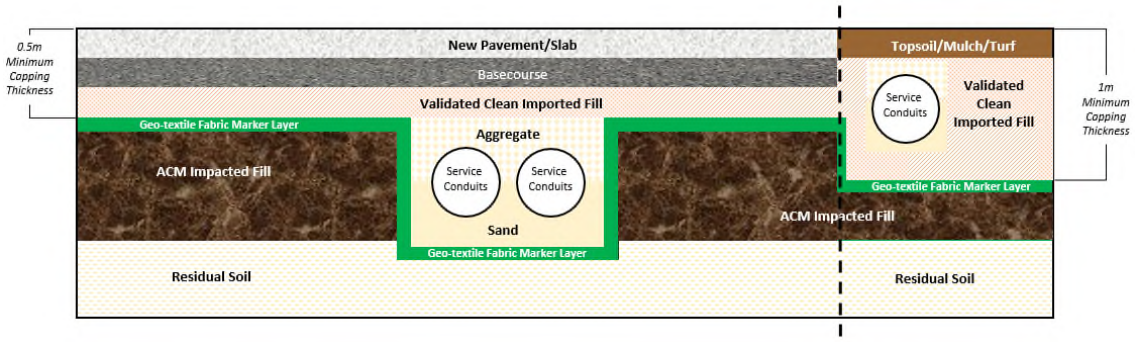
In **landscaped areas**, the capping is proposed to be at least **1m thick**, which will include 100mm of topsoil/mulch underlain by clean imported soil. Plants and trees should not be planted which have the potential to grow roots greater than the proposed capping thickness as they may breach the geofabric marker layer and impact on the integrity of the cap.

Where **services** are installed, they shall be installed within clean validated imported sand and/or aggregate.

A marker layer shall be placed in areas to separate asbestos impacted fill and the clean materials used to form the capping layer.

There is no specification for capping materials beneath rainwater tanks (if underground) and retaining walls as it is unlikely that the base of these structures will be breached by site users, visitors, and maintenance workers. Nonetheless, it is recommended that geofabric is laid on impacted fill (if present) prior to laying basecourse materials for these structures as a marker layer should future re-development take place.

A schematic of the proposed capping layer is provided below.



Fill material required to be imported to the site (i.e. soil, sand, aggregate (including base/subbase materials) and mulch) for backfilling, grading and landscaping purposes will be required to suitable (from a contamination perspective) for use.

- Excavated natural material (ENM) and virgin excavated natural material (VENM) will be required to have appropriate certification in accordance with the NSW EPA ENM/VENM exemption and order.

- Commercial products considered to include but not limited to aggregates, topsoil, sand and mulch will be required to have laboratory testing documentation from the source and have a specification.
- Prior to importation, the Environmental Consultant will need to approve the use of such material at the site. National Association of Testing Authorities endorsed analytical results may be required and/or further assessment of the material may be requested at the discretion of the Environmental Consultant prior to importation.
- An assessment of the soil, sand and aggregate used for backfilling and capping shall also be carried out during importation to confirm the material is suitable for use (refer to Section 9.3).

Coffey recommends not using recycled construction and demolition aggregates and sands such as crushed brick and concrete products as there is the potential to import asbestos mixed within the product.

During importation, the following information shall be recorded and maintained by the contractor and provided to Goodman at the completion of the works:

- Type, quantity and description of material imported
- Date and time of import;
- Source of material
- Truck registrations.

8.5. Surveying

Topographic surveys shall be carried out following placement of the geo-textile marker layer and at the completion of pavements/landscaping so that the depth of capping can be recorded for inclusion in the validation report (refer to Section 9.5) and the long-term environmental management plan (LTEMP) (refer to Section 10). The survey shall be carried out:

- With reduced levels (RL) to Australian Height Datum (AHD) and latitude/longitude coordinates; and
- On a grid of at least 5m x 5m, and 5m interval spacing along boundaries

8.6. Off-site disposal

Waste PPE/RPE generated during the earthworks will be required to be disposed off-site. Asbestos is pre-classified as Special (Asbestos) Waste, and must be transported by an appropriately licensed transporter, and disposed to a facility that is licensed to receive that class of waste.

Coffey understands that soils will be retained on-site. However, in the unlikely event that soils are required to be disposed offsite, the materials will be required to be classified in accordance with the NSW EPA (2014) Waste Classification Guidelines. It will be the responsibility of the Earthworks Contractor to ensure that the waste soils are suitably classified, that they are transported by an appropriately licensed haulage firm, that the soil movements are tracked and documented, and that the soil is disposed of at a landfill that is appropriately licensed to accept the type of waste received. Evidence of such shall be provided to Goodman for inclusion within the Validation Report.

It is important to note the Site Auditor will be required to view evidence that confirms adequate waste classification and proof that the receiving facilities are licensed to accept the wastes. If the Site Auditor is not satisfied with the classification of the waste or any other aspect of waste handling documentation, then they have a duty to note as such in their Site Audit Report and notify the NSW EPA.

8.7. Materials Tracking

Imported fill and materials taken offsite must be tracked for validation purposes. The Earthworks Contractor shall be required to prepare a Materials Tracking Plan, in which records of any materials transferred, imported or disposed offsite is documented. This may include recording relevant information including but not limited to:

- Stockpile name/number;
- Material origin and destination;
- Dates of stockpiling/transfer;
- Material description;
- Volume or weighed mass;
- Transport company including truck registrations and proof of identities.
- Where the stockpile(s) has been received, including the address and Environmental Protection Licence (EPL) number.

For asbestos or ACM, the POEO (Waste) Regulation 2014 requires tracking of all loads of asbestos greater than 100 kilograms, or 10 square metres within NSW. The POEO (Waste) Regulation 2014 requires the transport of asbestos in NSW to be recorded from the place of generation to its final destination using the NSW EPA's new online "WasteLocate" system. Transporters of asbestos waste are required to fulfil their duties with regards to tracking of asbestos and asbestos contaminated soil. Enquiries should be made with the EPA prior to offsite to disposal to confirm the status of the WasteLocate App and requirement to track asbestos waste generated during the earthworks.

8.8. Record keeping

Relevant documentation regarding the implementation of this CSDMP should be maintained by the appointed principal contractor and presented to Goodman. The documentation may include (but not be limited to):

- Site plans
- As-built topographic surveys showing the lateral extent and elevation of the geofabric marker layers and capping materials.
- The type(s) of geofabric marker layers.
- Materials tracking.
- Air monitoring and clearance certificates.
- Air monitoring certificates.
- Waste Classification Assessments (if undertaken).
- Details of any environmental incidents and/or unexpected finds of contamination which may have occurred during the course of the earthworks, and the actions undertaken in response to these incidents.
- A summary of material imported to the site for backfilling and regrading (i.e. soil, rock, aggregate, road base, mulch), including but not limited to volumes/mass, dates, sources, reports, laboratory certificates and transport dockets.
- A summary of waste disposed from site (i.e. soil, rock, aggregate, organic material (vegetation), and asbestos waste) including waste classification reports, volumes/mass, dates, disposal locations and disposal dockets.
- Staff and contractor inductions/toolbox talks/asbestos awareness training and training records.

- Relevant environmental reports.
- Photographs.
- Revisions of the CSDMP.

9. Validation Plan

A validation plan is required to ensure that relevant information is gathered and presented such that an assessment can be made as to the suitability of the site for its intended purpose. In summary, the following will be required to be validated:

- The type and extent of the geotextile fabric.
- The thickness of the capping layer and the materials used in its construction.
- Materials imported to the site.
- Materials disposed offsite (if carried out).

9.1. Data Quality Objectives

A process for establishing data quality objectives (DQOs) for an investigation has been defined by the US EPA and adopted in AS 4482.1-2005 and referenced in the amended ASC NEPM. DQOs are designed to:

- Set the study objectives;
- Collect the appropriate types and level of data (based on proposed recreational land use and CoPC); and
- Select appropriate tolerance levels for potential decision-making errors.

The DQO process is a seven-step iterative planning approach used to plan for environmental data collection activities. It provides a systematic approach for defining the criteria that a data collection design should satisfy, including when, where, who and how to collect samples or measurements, determination of tolerable decision error rates and the number of samples or measurements that should be collected.

The seven-step process for this validation plan and data quality indicators to be adopted are discussed and summarised in Appendix D.

9.2. Visual observations of geo-textile fabric

Observations by a suitably qualified consultant shall be carried during placement of the geo-textile fabric to assess whether the requirements specified in Section 8.4 are met.

9.3. Imported fill assessments

Imported material (i.e. soil, aggregate and mulch) will be required to be suitable (from a contamination perspective) for the proposed commercial/industrial land use.

To confirm the material is suitable for use, the following will be carried out:

- Prior to importation: Review of product documentation (i.e. VENM/ENM certificates, topsoil/mulch certification/documentation, base specifications).

- During importation: A visual inspection, sampling, field screening, laboratory analysis and assessment of the results.

9.3.1. Visual observations

Imported fill materials shall be visually observed during importation by an Environmental Consultant to check that it is consistent with that described in the source documentation, and for the presence of potential contamination.

9.3.2. Sampling and field screening

Fieldwork shall be undertaken by experienced and appropriately qualified environmental consultant following written field procedures which are based on industry accepted standard practice and the amended ASC NEPM 2013.

Soil samples shall be collected during importation. It is envisioned that samples will be collected from temporary stockpiles using a hand auger, shovel, or excavator depending on the dimensions of the stockpile and access.

A photo-ionisation detector (PID) shall be used to screen soil samples for the potential presence of volatile organic compounds (VOCs).

Between each sampling location, new nitrile gloves shall be used to reduce the potential for cross contamination to occur.

9.3.3. Sample nomenclature

Validation samples collected shall be identified by a unique sample identifier. The sample identifier should be included on all sample jars and associated paperwork including field sheets and chain of custody forms.

Sample labels shall be completed in indelible ink and include the following information:

- Project number
- Sample identifier
- Date of sample collection (day/month/year)
- Initials of sampler.

Quality control samples shall be labelled:

- Intra-laboratory and inter-laboratory duplicates: “DUP” + sequence number (i.e. DUP01, DUP02 etc.)
- Trip blanks: “TB” + sequence number (i.e. TB01, TB02 etc.)
- Trip Spikes: “TS” + sequence number (i.e. TS01, TS02 etc.)
- Rinsate blanks: “RB” + sequence number (i.e. RB01, RB02 etc.)

9.3.4. Sample storage and preservation

Samples shall be placed into laboratory prepared and supplied sample containers (i.e. jars, bags and bottles) with teflon-lined lids and preservatives, where required.

For analysis of VOCs, samples shall be created as rapidly as possible with zero headspace where practicable, attempting to minimise volatile losses. Samples shall be submitted as soon as possible to

the laboratories to prevent loss while in storage or transit and analysed within recommended holding times.

Sample containers shall be placed directly into an ice filled cooler and transported to the laboratories under chain of custody protocol. All samples are required to be documented as received by the laboratory chilled and intact.

9.3.5. Decontamination procedures

Non-disposable sampling equipment (e.g. trowel, shovel etc.) shall be decontaminated between each sampling location as follows:

- Scrub all surface of the equipment with a wire brush to remove soil and/or gross contamination;
- Scrub the equipment in a bucket filled with a solution of phosphate free detergent (Decon 90), using a brush that can reach all surfaces;
- Rinse the equipment in clean potable water; and
- Allow the equipment to air dry.

9.3.6. Equipment calibration

Equipment shall be calibrated as per the manufacturer's instructions.

The PID shall be bump tested with isobutylene gas at 0 ppm and 100 ppm at the commencement of each day of sampling and if necessary during the day in accordance with the procedure provided by the supplier.

Calibration certificates and bump test results shall be retained and provided within the validation report.

9.3.7. Field quality control samples

Field quality control samples shall be collected as follows:

- Intra-laboratory and inter-laboratory duplicates
- Rinsate blanks
- Trip blanks and Trip Spikes.

Field duplicate soil samples shall be collected from soil immediately adjacent to the primary sample by placing approximately equal portions of the primary sample into two sample jars. Samples shall be labelled so as to conceal their relationship to the primary sample from the laboratory.

Rinsate blanks shall consist of pre-preserved bottles filled with laboratory prepared water that is passed over decontaminated field equipment and then collected in containers used for the sampling process. Rinsate blanks shall be preserved in a similar manner to the original samples.

Trip blank and trip spike samples shall be prepared by the primary laboratory during soil validation sampling, carried to the field unopened and subjected to the same preservation methods as the primary field samples.

9.3.8. Laboratory analysis

Soil samples shall be analysed by ISO/IEC 17025 certified laboratories with NATA accredited methods for the analytes outlined in Table 3. The analytical suite shall be determined by the environmental consultant based on the source and characteristics of the material.

Table 3: Proposed Laboratory Analysis

Type	Rate	Analysis
Quarried VENM	-	Visual assessment only if documentation is adequate
VENM	Rate to be dependent on source and confirmed by Environmental Consultant and Site Auditor prior to import. Typical sampling frequencies include 1/100m^3, 1/250m^3 and 1/500m^3 depending on the source and volume, with a minimum of 3 samples per source.	Source dependant although may include TRH, BTEX, PAH, OCP, OPP, PCB, metals and asbestos. Analytical suite is dependent on the source and is to be confirmed by Environmental Consultant and Site Auditor prior to import.
ENM	As per Table 1 of the NSW EPA current Excavated Natural Material Order 2014.	As per Table 4 of the NSW EPA current Excavated Natural Material Order 2014 (metals, electrical conductivity, pH, TRH, BTEX, PAHs, metals, foreign materials), OCP, OPP, PCB and asbestos.
Recycled Aggregates	1/250 tonnes Considered to include but not limited to products containing crushed brick and concrete (e.g. unbound subbase (UBS), 40/70 aggregate, 10 mm aggregated, 20 mm aggregate, recycled sands)	Asbestos – collection of a 500 mL sample using Western Australia Department of Health Guideline 2009 field screening method.
Topsoil	As per Table 1 of the NSW EPA current Excavated Natural Material Order 2014.	As per Table 4 of the NSW EPA current Excavated Natural Material Order 2014 (metals, electrical conductivity, pH, TRH, BTEX, PAHs, metals), OCP, OPP, PCB and asbestos. Silica gel clean-up may also be required pending TRH results.
Mulch	A visual inspection should be undertaken of each load imported for signs of potential asbestos containing materials, engineered wood products, treated/coated wood residues or anthropogenic materials (physical contaminants such as glass, metal, plastics etc.) and the material should supplier documentation certifying the mulch does not contain these materials nor contain weed, pests or disease. Where such materials are identified within the mulch, the mulch shall not be applied to site.	Asbestos – collection of a 500 mL sample using Western Australia Department of Health Guideline 2009 field screening method.

TRH: Total recoverable hydrocarbons
BTEX: Benzene, toluene, ethylbenzene and xylene
PAH: Polycyclic aromatic hydrocarbons
OCP/OCP: Organochlorine pesticides/ organophosphate pesticides
PCB: Polychlorinated biphenyls
Metals: arsenic, cadmium, chromium, lead, nickel, zinc, mercury and copper

In the event that any materials not listed in Table 3 are required for import to site, approval of suitability of material including required sampling densities and laboratory analysis must be

granted from the validation consultant in consultation with NSW EPA Accredited Auditor prior to import.

9.3.9. Validation criteria

The material imported to the site will be VENM or ENM.

Virgin excavated natural material

Laboratory results for material imported as VENM will meet the definition of VENM as per the POEO requirements and also meet the following validation criteria:

- Ambient background concentrations (ABC) of metals (where available) adopted from Schedule B5b of the amended ASC NEPM 2013:
  - Zinc: 3 mg/kg to 60 mg/kg
  - Arsenic: 1 mg/kg to 18 mg/kg
  - Copper: 2 mg/kg to 40 mg/kg
  - Lead: 0.1 mg/kg to 30 mg/kg
  - Nickel: 1 mg/kg to 55 mg/kg
  - Trivalent chromium: 3 mg/kg to 160 mg/kg.
- TRH, BTEX, PAH, OCP, OPP and PCB results less than the limit of detection for the method. Asbestos results will be required to be reported as 'no asbestos detected'.

Excavated Natural Material

Material imported as ENM will be expected to have analytes less than the maximum average concentration for characterisation, and absolute maximum concentration, listed in Table 4 of the ENM order. These values are provided in Table 4 below for reference. Asbestos results will be required to be reported as 'no asbestos detected'.

Table 4: ENM Criteria

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)
Mercury	0.5	1
Cadmium	0.5	1
Lead	50	100
Arsenic	20	40
Chromium (total)	75	150
Copper	100	200
Nickel	30	60

Column 1 Chemicals and other attributes	Column 2 Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Column 3 Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)
Zinc	150	300
Electrical Conductivity	1.5 dS/m	3 dS/m
pH *	5 to 9	4.5 to 10
Total Polycyclic Aromatic Hydrocarbons (PAHs)	20	40
Benzo(a)pyrene	0.5	1
Benzene	NA	0.5
Toluene	NA	65
Ethyl-benzene	NA	25
Xylene	NA	15
Total Petroleum Hydrocarbons C10-C36	250	500
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*

Recycled Aggregates

The adopted criteria for assessment of recycled aggregates imported to site is presence/absence of asbestos. If the imported recycled aggregates are found to contain asbestos, they shall either be removed from site, or a risk assessment shall be carried out to further assess the material's suitability. The assessment will include comparison of laboratory results to the applicable commercial/industrial Health Screening Levels (HSLs) supplied in ASC NEPM and consideration as to how and where the materials are to be used on-site to assess whether they are suitable for the intended use.

Topsoil

As topsoil can be a blended or recycled product, topsoil material imported for use at the site will be compared against the relevant HSLs, Health Investigation Levels (HILs), Ecological Screening Levels (ESLs) and Ecological Investigation Levels (EILs) for commercial/industrial landuse as supplied in ASC NEPM.

Mulch

In the event that sampling of mulch for asbestos is required, the adopted criteria for mulch imported to site is presence/absence of asbestos. As mulch products are likely to be used as a finished covering layer, if asbestos is identified in the mulch it shall be removed from site.

Aesthetics

In addition to the numerical criteria, consideration shall be given to the presence of soils that are odorous or discoloured as a result of contamination, contain visible ACM, excessive extraneous material, for qualitative aesthetic purposes.

9.4. Quality assurance and control

Project specific quality assurance/quality control (QA/QC) procedures will be implemented to improve transparency, consistency, comparability, completeness, and confidence in the data collected.

The field procedures to be adopted during the validation assessment are discussed above. Laboratory QA/QC procedures and adopted DQIs are discussed in Appendix D.

9.5. Validation Report

At the completion of the earthworks and capping, a validation report shall be prepared in general accordance with OEH 2011 and the amended ASC NEPM 2013, documenting that the capping works have been completed. This report shall contain information including:

- Details of the site, environmental setting and contamination status.
- A summary of the asbestos capping works completed including:
  - Material tracking information (to be provided by the Earthworks Contractor).
  - Survey Data confirming the location, extent or geofabric and capping material.
  - Photographs of the earthworks.
- A summary of site inspections completed.
- Details of the source, classification and suitability of all imported materials.
- Waste characterisation data and associated reports, haulage dockets and receipts from licenced disposal facilities (to be provided by the Earthworks Contractor).
- Evidence of adequate waste classification process and proof that receiving facilities are licenced to accept the wastes (to be provided by the Remediation Contractor).
- Air monitoring and clearance certificates.
- Any variations to the strategy undertaken during the implementation of the capping works.
- Details of any environmental incidents and/or unexpected finds of contamination occurring during the course of the capping works and the actions undertaken in response to these incidents.
- Clear statement of the suitability of the site that is the subject of the validation report, for the proposed use.
- Scope and requirements for the ongoing management of the capping layer, including an outline of the LTEMP.

10. Long-Term Environmental Management Plan

A LTEMP shall be prepared by a suitably qualified Environmental Consultant following completion of the capping works in general accordance with the DIPNR (2000) Guideline for the Preparation of Environmental Management Plans and with consideration of the requirements for environmental management plans described in the NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme. It will be the responsibility of NSW Ports for implementation of the LTEMP.

The LTEMP shall include the following:

- A description of the site and its location.
- An outline of the purpose and objectives of the LTEMP.
- A description of the nature and location of asbestos contamination capped at the site.
- A description of the capping layer constructed including and thickness and materials used
- A long-term maintenance and monitoring/inspection programme to maintain the effectiveness of the cap.
- A description of the procedures for initiating and recording maintenance activities, monitoring results, non-conformances, and corrective actions taken to rectify any non-conformance.
- Actions that trigger intervention in response to monitoring observations.
- An outline of the entities responsible for the implementation of the LTEMP.
- A description of procedures to control potential health risks during future excavations and subsurface ground works that may penetrate the capping layer.
- A schedule for review of the LTEMP.

11. Approvals, Notifications and Licences

Prior to earthworks commencing, all relevant licences and approvals shall be obtained from the relevant authorities.

11.1. Asbestos related licences

Based on the types of asbestos identified previously, A SafeWork NSW Class A Licensed Asbestos Removal Contractor (LARC) will be required to conduct and/or oversee asbestos related works. The Class A LARC supervisor will be required to be present at the site during asbestos related works.

As friable asbestos has previously been identified within fill soil at Enfield ILC, a NSW Licenced Asbestos Assessor (LAA) will be required on-site during earthworks for supervision, air monitoring and perform visual clearances.

11.2. Regulator notification

The Class A LARC will be required to lodge and obtain the necessary SafeWork NSW asbestos removal permit prior to commencement of asbestos related works (5 days notification required). An Asbestos Removal Control Plan (ARCP) will be required to be prepared by the LARC and submitted with the notification. The ARCP must be aligned with this CSDMP and include:

- Details of the asbestos which will and may be encountered, including the location, type and condition of the asbestos.
- Details of how the capping works will be carried out and how asbestos impacted soil will be handled, including the method to be used and the tools, equipment and personal protective equipment to be used.

11.3. Community consultation

Prior to implementing asbestos controls at the site, Coffey recommends that consultation with adjoining properties is carried out to alleviate concerns associated with asbestos, which may arise during earthworks.

12. Contact information

The contact details provided in Table 5 shall be displayed in a prominent location (such as the entrance or site office). Should any incidents of concern occur they shall be initially reported to the Site Manager, who will prepare an incident report for the Project Manager.

Table 5: Contact Details

Name	Company	Responsibility	Contact Details
TBA	TBA (Earthworks Contractor)	Site Manager	TBA
TBA	TBA (Earthworks Contractor)	Project Manager	TBA
Ben Milner	Goodman	Goodman Representative	(02) 9230 7120
TBA	TBA (Environmental Consultancy)	Licenced Asbestos Assessor	TBA
TBA	TBA (Asbestos Removalist)	Class A Licenced Asbestos Removal Contractor	TBA

TBA: To be confirmed once contractor appointed

13. Asbestos Control Measures During Earthworks

The control measures outlined within this CSDMP have been recommended based on the proposed excavation and disturbance of friable and bonded ACM contaminated soil within an outdoor environment.

The appointed contractor and workers at the site must comply with all legislative, regulatory and guidance requirements, including but not limited to, the asbestos control measures outlined in this Section. If the legislation, regulations or guidelines contradict the information presented here the legislation, regulations or guidelines prevail.

13.1. Summary of Responsibilities

Each individual involved in earthworks will be responsible for complying with all relevant Work Health and Safety legislation, regulations and guidelines including, but not limited to those outlined in Table 6.

Coffey understands that a contractor will be engaged by Goodman to carry out the earthworks, and the following additional parties may also be required to complete the earthworks:

- A Class A Licensed Asbestos Removal Contractor (LARC), as discussed in Section 11.
- A Licenced Asbestos Assessor, as discussed in Section 11.

- Other subcontractors and labourers as required.

Table 6: Summary of Responsibilities for asbestos related works

Position/ Organisation	Reports to	Summary of Responsibilities for Stockpile Removal
Goodman Property Services	Ports NSW	Gain works approvals from NSW Ports for excavation works including breaching of cap.
Principal Contractor / Appointed Earthworks Contractor (TBC)	Goodman Property Services	Ensure works are completed in accordance with this CSDMP. Ensure contractors engaged in earthworks are inducted to this CSDMP prior to the commencement of works. Ensure that earthworks are carried out or overseen by a by a SafeWork NSW Class A LARC. Ensure that asbestos fibre air monitoring, and clearance inspections and certificates, are carried out by a Licenced Asbestos Assessor. Review and update records as required and implement corrective actions where necessary. Control access to asbestos work areas. Ensure that workers engaged by the person, whom the person reasonably believes may be involved in asbestos removal work or in the carrying out of asbestos-related work, are trained in the identification and safe handling of, and suitable control measures for, asbestos and ACM. Maintain soil tracking during relocation and stockpiling of contaminated soil.

Position/ Organisation	Reports to	Summary of Responsibilities for Stockpile Removal
Class A Licensed Asbestos Removal Contractor (LARC)	Principal Contractor	Hold a SafeWork NSW issued Class A Asbestos licence for asbestos removal. Develop an Asbestos Removal Control Plan (ARCP) for the excavation, handling and disposal of asbestos impacted soil and give written notice to SafeWork NSW at least 5 days before licensed asbestos removal work commences. The asbestos removal supervisor must be onsite whenever the work is being carried out. Provide appropriate training to workers carrying out licensed asbestos removal work to ensure that the work is carried out in accordance with the ARCP and this CSDMP. Ensure that workers engaged by the person, whom the person reasonably believes may be involved in asbestos removal work or in the carrying out of asbestos-related work, are trained in the identification and safe handling of, and suitable control measures for, asbestos and ACM. Keep a record of the training undertaken by a worker carrying out licensed asbestos related work and ensure that the training record is readily accessible at the site and available for inspection. Give information about health risks of licensed asbestos removal work to a person likely to be engaged to carry out licensed asbestos work before the person is engaged to carry out the work. Dispose of personal protective equipment appropriately.
Asbestos Removal Worker	Class A LARC and Principal Contractor	Asbestos removal worker must be trained in the identification and safe handling of, and suitable control measures for, asbestos and ACM. Limit access to asbestos work area. Dispose of asbestos waste and contaminated personal protective equipment appropriately. Carry out works in accordance with the ARCP and this CSDMP.
Licenced Asbestos Assessor	Principle Contractor or Class A LARC	Conduct asbestos fibre air monitoring. Carry out visual clearance inspections. Dispose of personal protective equipment appropriately.

13.2. Asbestos awareness training

Prior to commencement of excavation of asbestos impacted soil, in line with the SafeWork NSW How to Manage and Control Asbestos in the Workplace Code of Practice 2016, all relevant site personnel must have completed asbestos awareness training such that all workers are trained to recognise

potential health risks and control measures associated with asbestos. The Class A Supervisor or the Licenced Asbestos Assessor may provide the asbestos awareness training on site prior to commencement of excavation of asbestos impacted soil.

13.3. Inductions

Relevant personnel involved in asbestos related works shall be inducted into this CSDMP. Details of contractors or other personnel who have attended the induction are to be kept on the site in Appendix E of this CSDMP.

13.4. Toolbox talks

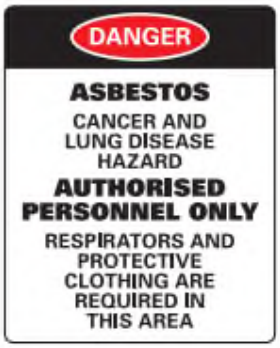
Prior to commencing excavation and handling of asbestos impacted soil or following change in site conditions, all relevant site personnel should participate in a toolbox talk. The toolbox talk must incorporate details and instructions on how to manage asbestos-impacted soil in accordance with this CSDMP. The toolbox talk can be combined with the Induction if practicable.

13.5. Barricades and signs

Signs and barricades must be placed to clearly demarcate where excavation and handling of asbestos impacted soil are being performed and restrict access to personnel not involved in the works.

Barricades may comprise temporary fencing with wind rated mesh/geofabric. It is recommended that the general public cannot see in to the work site due of the perceived risk of exposure, which could be exacerbated when observing workers wearing asbestos related PPE/RPE.

Signs should be in accordance with AS 1319-1994 Safety signs for the occupational environment for size, illumination, location and maintenance. The following graphic is an example of warning sign provided in SafeWork NSW How to Manage and Control Asbestos in the Workplace Code of Practice 2016.



13.6. Dust suppression

Dust suppression techniques will be required to control generation of visible dust during the course of the works. Dust suppression techniques may include one or a combination of the following:

- Fine water spraying/misting directly onto the soil and on the boundaries of the site.
- Use of PVA to stabilise the soil.
- Covering soil within trucks using tarpaulin or fabric cover.

- Covering dump truck/skip bins/stockpiles with high-density polythene (HDPE) sheeting or geotextile fabric.
- Restrict trucks to low speeds when transporting ACM impacted soils to stockpile locations.
- Ceasing works if visible dust is being generated from the site.

13.7. Erosion and sediment control

Erosion and sediment controls must be in place prior to commencement of work. The nature of the erosion and sediment controls will depend on the amount of water generated by construction activity and dust suppression. Examples include sediment barriers and traps to mitigate sediment load entering the stormwater system or migrating offsite. Sediment controls (i.e. hay bales, sand bags and/or silt fencing) may be required to be installed surrounding stockpiles.

13.8. Wheel Wash Bay

To minimise tracking of contaminated soil on vehicles leaving the site, a wheel wash bay shall be installed at the site entrance/exit. This shall comprise a cattlegrid underlaid by geo-textile fabric with aggregate on either side.

All vehicles are to be washed in the wheel wash bay prior to leaving the site.

Where vehicles have been used on surfaces deemed to be contaminated, tyres and wheels and are to be cleaned using a low-pressure hose and/or hand tools where necessary.

If vehicles used on contaminated surfaces are cleaned in the wheel wash bay, the underlying geotextile fabric, accumulated soil and aggregate must either be placed beneath the cap or be disposed of as special waste, asbestos waste to an appropriately licenced facility following waste classification sampling.

13.9. Personal protective and respiratory protective equipment

Personnel onsite will be required to wear appropriate personal protective equipment in line with WHS requirements specific to the task. For workers working within the site during excavation and handling of asbestos impacted soil, the following PPE/RPE is also mandatory:

- Half face respirator (i.e. Sundstrom SR900 Half Mask) with P3 particle filter.
- Footwear that can be easily decontaminated (i.e. gumboots) or disposable booties.
- Type 5 Tyvek suits.
- Disposable nitrile gloves.

Excavator operators or truck drivers may be exempt from asbestos RPE requirements if it can be shown that the excavator/truck cabs can be sealed during works and reverse cycle air conditioning can be engaged.

Respirators must comply with AS/NZS1715–2009 Selection, use and maintenance of respiratory equipment. Occupational protective gloves shall comply with EN 420:1994(AS/NZS 2161.2:1998)– Occupational Protective Gloves, Part 2 General Requirements.

Examples of appropriate PPE and RPE are provided in Appendix F.

13.10. Asbestos decontamination

Decontamination facilities will be required for machinery, equipment, and workers carrying out asbestos related work. Based on the asbestos related works to be undertaken and in consideration of site conditions, decontamination procedures shall include, but not be limited to:

- Establishment of a **'personal decontamination area'** and **'personal clean area'** adjacent to the asbestos work area using bollards and tiger tails, and 200 µm polythene sheeting on the ground. A trailer mounted 3 or 5 Stage Modular Decontamination Unit may be used for personal decontamination in place of a dry-decontamination area.
- When entering the site:
    1. Workers must enter the 'Personal Clean Area' and change into clean asbestos specific protective clothing.
    2. Any removed personal clothing must be stored in a dust-proof container.
    3. Move into the site.
- When leaving the site:
    1. Workers must enter the 'Personal Decontamination Area' and:
        - Remove any visible asbestos dust/residue from protective clothing by wiping down with damp cloths/wet wipes.
        - Place cloths/wet wipes into heavy duty polythene asbestos waste bags (1200mm long, 900mm wide, and 200 µm thick).
        - Carefully remove disposable protective clothing and place into asbestos waste bags (RPE must still be worn).
        - Use a footbath and/or damp cloths/wet wipes to wipe down footwear and place cloths/wet wipes into asbestos waste bags.
        - Place disposable mask into asbestos waste bags or wet wipe half face respirator.
        - Seal all asbestos waste bags with duct tape and place each into a second plastic bag.
        - Seal this second plastic bag and label/mark as 'Asbestos Waste' for subsequent off-site disposal. The bags must be twisted tightly and have the neck folded over and secured with adhesive tape (referred to as goose-necking).
    2. Move into the 'Personal Clean Area' and put on personal clothes.
- To reduce the risk of an asbestos waste bag tearing or splitting and to assist in manual handling, asbestos waste bags should not be filled more than half full (depending on the weight of the items) and excess air should be gently evacuated from the waste bag in a way that does not cause the release of dust. The 200 µm polythene sheeting which was placed on the ground in the personal decontamination area shall be disposed of as asbestos waste at the completion of the works.

Machinery and reusable equipment shall be decontaminated in a designated Decontamination Area using water and wet rags.

13.11. Handling of asbestos impacted soil

Asbestos impacted soil shall be handled in manner in which to minimise the potential for cross contamination of areas that have been previously been cleared by:

- Placing the soil directly into a dump truck or skip bins.
- Not overloading the dump truck or skip bins.

- Keeping movements of vehicles, plant and equipment to a practical minimum and maintaining low speeds during transportation.
- Using designated transportation routes/corridors between precincts and designated stockpile areas.
- Tracking of soil from cradle to grave by principal contractor.
- Stockpiling spoil on a reasonably robust barrier (i.e. concrete, geofabric and plywood).

13.12. Stockpile management

The following is required for stockpiled soil, if stockpiles are to be generated:

- Stockpiles shall be established:
  - Away from adjacent properties, drainage lines and water bodies. Avoid designated drains, sumps and low-lying areas subject to flooding or runoff. and
  - On a reasonably robust barrier (i.e. concrete, geofabric and plywood).
- Dust suppression and erosion and sediment controls shall be in place in accordance with Section 13.6 and 13.7 of this CSDMP.
- Stockpiles shall:
  - Not exceed the height of site boundary hoarding to minimise dust generation from the site.
  - Be less than 2m in height with side slopes to be a maximum ratio of 1V:2H.
  - Be appropriately labelled to minimise the risk of cross contamination.
  - Be positioned and formed to minimise potential for stockpile erosion where possible.

At the end of each day, stockpiles shall be wetted down, covered with 200 µm polythene sheeting or geofabric.

13.13. Asbestos fibre air monitoring

A licenced asbestos assessor (LAA) shall carry out air monitoring of the work area during excavation and handling of asbestos impacted soil. The LAA shall undertake control (minimum of four monitoring locations on the boundaries) and exposure monitoring using static or positional samples during excavation and handling of asbestos impacted soil. Asbestos fibre air monitoring results shall be discussed at the following shift toolbox talk and presented on a site noticeboard to inform site workers of the results.

Air monitoring shall be conducted by a National Association of Testing Authorities (NATA) accredited laboratory in accordance the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC: 3003 (2005)] and Australian Standard AS ISO/IEC 17025 – 2005, General requirements for the competence of testing and calibration laboratories. Air Monitoring Reports are required to be issued in accordance with NATA's accreditation requirements.

Works must be suspended if the air monitoring results are found to be above the detection limit of 0.01 fibres per millilitre of air (f/mL). The control limits/action levels are set out in Table 7.

Table 7: Air Monitoring Control limits

Action level (fibres/ml)	Control	Action
< 0.01	No new control measures are necessary	Continue with control measures.
0.01 to ≤ 0.02	1 - Review	Review control measures.
	2 - Investigate	Investigate the cause.
	3 - Implement	Implement controls to eliminate or minimise exposure and prevent further release.
> 0.02	1 - Stop removal work	Stop earthworks.
	2 - Notify regulator	Notify the regulator (SafeWork NSW) by phone followed by fax or written statement that work has ceased & the results of the air monitoring.
	3 - Investigate the cause	Conduct a thorough visual inspection of the site in consultation with all workers involved.
	4 - Implement controls to eliminate or minimise exposure and prevent further release	Review the controls to eliminate or minimise exposure and prevent further release
	5 - Do not recommence removal work until further air monitoring is conducted	Do not recommence until fibre levels are ≤ 0.01 fibres/mL

13.14. Asbestos visual clearance inspections

The LAA will be required to carry out visual clearance inspections of the site to verify that areas of the site can be reoccupied without asbestos controls including, but not limited to:

- Where asbestos impacted soil has been removed to underlying natural soil.
- Where asbestos impacted soil has been capped with geofabric.
- At the completion of the works.

The LAA who carried out the clearance inspection must issue a clearance certificate before the area requiring clearance is re-occupied. A clearance certificate must not be issued unless LAA is satisfied that:

- The inspection area, and the area immediately surrounding it, are free from visible asbestos; and
- Air monitoring results, if undertaken as part of the clearance inspection, shows asbestos below 0.01 fibres/Ml.

14. Contingency Plan and Unexpected finds

The conditions encountered during earthworks can be uncertain. A set of typical issues/unexpected finds and proposed corrective actions are provided in Table 8. Should an unexpected find be identified then the unexpected finds procedure included in Appendix G shall be followed.

Table 8: Contingency Plan/Unexpected Finds

Potential issues	Proposed corrective actions, as appropriate	Communication and additional sampling/ monitoring
Excessive stormwater	Stop works. Check control measures are adequate to prevent surface water runoff entering and leaving the site.	Breaches should be recorded outlining implemented control measures. Continue monitoring/sampling as required.
Excessive dust	Use water sprays; stop dust-generating activity until better dust control can be achieved or apply interim capping systems on stockpiles or exposed material. Stop work in high wind conditions. Works shall cease if the air monitoring results are found to be above the detection limit of 0.01 fibres per millilitre of air. Actions and controls for air monitoring are outlined in Section 13.13.	Breaches should be recorded outlining implemented control measures. Additional monitoring/sampling may be required – refer to Section 13.14.
Heavy rain	Ensure sediment and surface water controls are operating correctly. If possible divert surface water away from active work areas or excavations. Cover stockpiles.	Water accumulated in excavations may require sampling by an Environmental Consultant for potential contaminants of concern prior to pump out/offsite disposal. Management/disposal options to be formulated based on analytical results.
Equipment failures	Maintain spare equipment or parts; keep rental options available or shut down affected operations until repairs are made. Clean up the spill with absorbent material. Stockpile the impacted material in a secure location.	Sample impacted materials for chemicals of potential concern and assess appropriate disposal/treatment option based on an assessment of analytical results.
Relics/human remains	If human remains, buried stone artefacts or other indications of an aboriginal site are discovered during excavation work, work shall cease until an appropriate action can be confirmed.	Goodman, Ports NSW and the required authorities are required to be notified.
Discovery of underground tanks during excavation works	Work to be suspended until Environmental Consultant can further assess impacted soils/materials and associated risks. Tank removal works to be overseen and validated by Environmental Consultant.	Validation of excavations after tank removal by Environmental Consultant. Validation samples would at a minimum be analysed for TRHs, BTEX compounds, lead and PAHs.

Identification of malodourous or stained soils	Work to be suspended until Environmental Consultant can further assess impacted soils/materials and associated risks.	Sample impacted materials and assess appropriate disposal/treatment option based on an assessment of analytical results
The cap is required to be excavated or piled through	The earthworks contractor shall discuss the required scope of work with the Environmental Consultant such that asbestos controls can be put in place and a procedure prepared to reduce cross contamination and manage excess spoil.	Environmental Consultant to be notified. An addendum to this CSDMP may be required.
Complaints are received directly relating to the works undertaken	Stop works and implement control measures to address complaint (if possible).	Notify relevant Principal Contractor following complaint and follow incident procedure.
Damage to existing services (i.e. gas, electricity, plumbing)	Cease Works Immediately.	
Water in excavations	Stop works and investigate the source of water ingress (i.e. service or groundwater). Cap source if possible to limit ingress.	Collect samples and assess against relevant NSW EPA guidelines to enable disposal options to be formulated.

15. Conclusion

Goodman and Ports propose to redevelop Precinct E for industrial use. Asbestos contaminated fill has previously been stockpiled and capped on Precinct E.

The redevelopment will include cut and fill of existing fill, placement of a geofabric marker layer and capping with imported VENM/ENM prior to placement of slabs or landscaping. Excavation and off-site disposal of impacted fill would be a contingent option in the event that capping cannot be achieved due to unforeseen circumstances. Prior to the disposal of surplus material from the site the Environmental Consultant/Occupational Hygienist will be required to carry out a waste classification assessment of the material in accordance with the NSW EPA Waste Classification Guidelines.

Capping works will be required to be validated by a suitably qualified consultant which will include a program of inspections, sampling, laboratory analysis and reporting. At the completion of the capping works, a validation report will be required to be prepared in general accordance with NSW OEH 2011 *Guidelines for Consultants Reporting on Contaminated Sites*, and the National Environment Protection (Assessment of Site Contamination) Measure, 1999 (amended April 2013), documenting the works as completed.

A long-term EMP will also be required to be prepared following capping which succinctly describes the nature and location of contamination remaining on-site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place. The long-term EMP will be required to be recorded on the planning certificate issued under section 10.7 of the EP&A Act 1979 or a covenant registered on the title to land under section 88B of the Conveyancing Act 1919.

Coffey understands that this CSDMP will be reviewed and endorsed by a NSW EPA accredited Site Auditor, Tom Onus of Ramboll. Tom Onus has been appointed to prepare a Site Audit Report and Site Audit Statement at the completion of capping works certifying that the site is suitable for its intended use subject to compliance with the long-term EMP.

Subject to the successful implementation of the measures detailed in this CSDMP, it is considered that the site can be made suitable for the proposed industrial development.

16. Limitations

This report should be read in conjunction with the attached "Important information about your Coffey Environmental Report"

Important Information about your Coffey Environmental Report

Important information about your **Coffey** Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but

steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

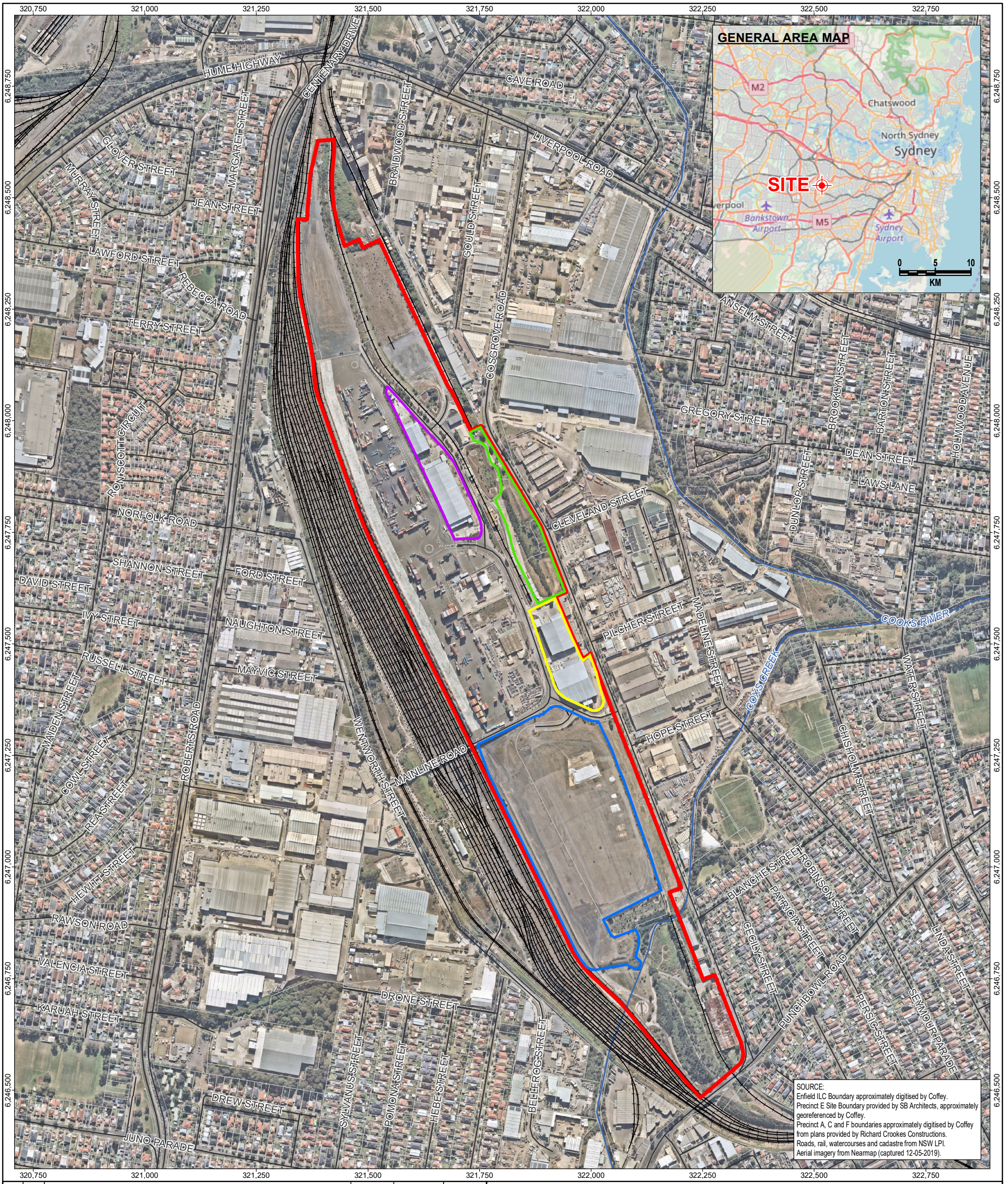
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Figures



SOURCE:
Enfield ILC Boundary approximately digitised by Coffey.
Precinct E Site Boundary provided by SB Architects, approximately georeferenced by Coffey.
Precinct A, C and F boundaries approximately digitised by Coffey from plans provided by Richard Crookes Constructions.
Roads, rail, watercourses and cadastre from NSW LPI.
Aerial imagery from Nearmap (captured 12-05-2019).

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	GH	SH	13.06.19

DRAFT

LEGEND

- Road
- Track
- Railway
- Watercourse
- Cadastre
- Precinct E Site Boundary
- Precinct A Boundary
- Precinct C Boundary
- Precinct F Boundary
- Enfield ILC Boundary

N

0 80 160 240 320
SCALE 1:8,000 (A3) METRES
Projection: GDA 1994 MGA Zone 56

drawn	GH
approved	SH
date	13.06.2019
scale	AS SHOWN
original size	A3

coffey
A TETRA TECH COMPANY

client: NSW PORTS

project: CONTAMINATED SOIL DISTURBANCE MANAGEMENT PLAN: PRECINCT E
ENFIELD ILC
MAINLINE ROAD, STRATHFIELD SOUTH NSW

title: SITE BOUNDARY AND PRECINCT BOUNDARIES

project no:	figure no:	rev:
SYDEN230542_R02	FIGURE 1	A

MXD Template Reference: 230542_02_GIS001_v0_1

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	XA	SH	16.01.20

DRAFT

LEGEND

- Precinct E Site Layout
- Stockpile
- Cadastre
- Precinct E Site Boundary
- Precinct C Boundary
- Precinct F Boundary
- Enfield ILC Boundary

N

0 15 30 45 60

SCALE 1:1,500 (A3) METRES

Projection: GDA 1994 MGA Zone 56

drawn	XA
approved	SH
date	16.01.2020
scale	AS SHOWN
original size	A3

coffey
A TETRA TECH COMPANY

client:	NSW PORTS
project:	CONTAMINATED SOIL DISTURBANCE MANAGEMENT PLAN: PRECINCT E ENFIELD ILC MAINLINE ROAD, STRATHFIELD SOUTH NSW
title:	PRECINCT E SITE FEATURES
project no:	SYDEN230542_R02
figure no:	FIGURE 2
rev:	A

MXD Template Reference: 230542_02_GIS02_v0_3

Appendix A – Architectural Plans

PROPOSED ENFIELD INTERMODAL LOGISTICS CENTRE

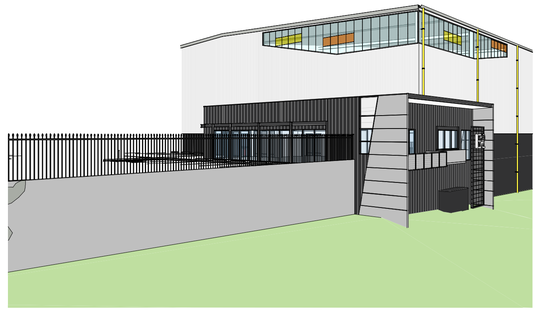
PRECINCT E

Drawing List

EILC DA 40	PRECINCT 'E' SITE & FLOOR PLAN
EILC DA 41	PRECINCT 'E' OVERALL SITE PLAN
EILC DA 402	OVERALL BUILDING ELEVATION
EILC DA 410	E1 SITE & FLOOR PLAN
EILC DA 411	E1 ROOF PLAN
EILC DA 412	E1 OFFICE FLOOR PLAN
EILC DA 413	E1 BUILDING ELEVATIONS
EILC DA 414	E1 OFFICE ELEVATIONS
EILC DA 415	E1 OVERALL SECTIONS
EILC DA 416	E1 OFFICE REFLECTED CEILING PLAN
EILC DA 420	E2 SITE & FLOOR PLAN
EILC DA 421	E2 ROOF PLAN
EILC DA 422	E2 OFFICE FLOOR PLAN
EILC DA 423	E2 BUILDING ELEVATIONS
EILC DA 424	E2 OFFICE ELEVATIONS
EILC DA 425	E2 OVERALL SECTIONS
EILC DA 426	E2 OFFICE REFLECTED CEILING PLAN

NSW Ports in partnership with Goodman

1 E1 OFFICE PERSPECTIVE



2 E2 OFFICE PERSPECTIVE

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

PRECINCT 'E' COVER SHEET

NTS

07.01.20

EILC DA 0 (1)

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Precinct E Area Schedule

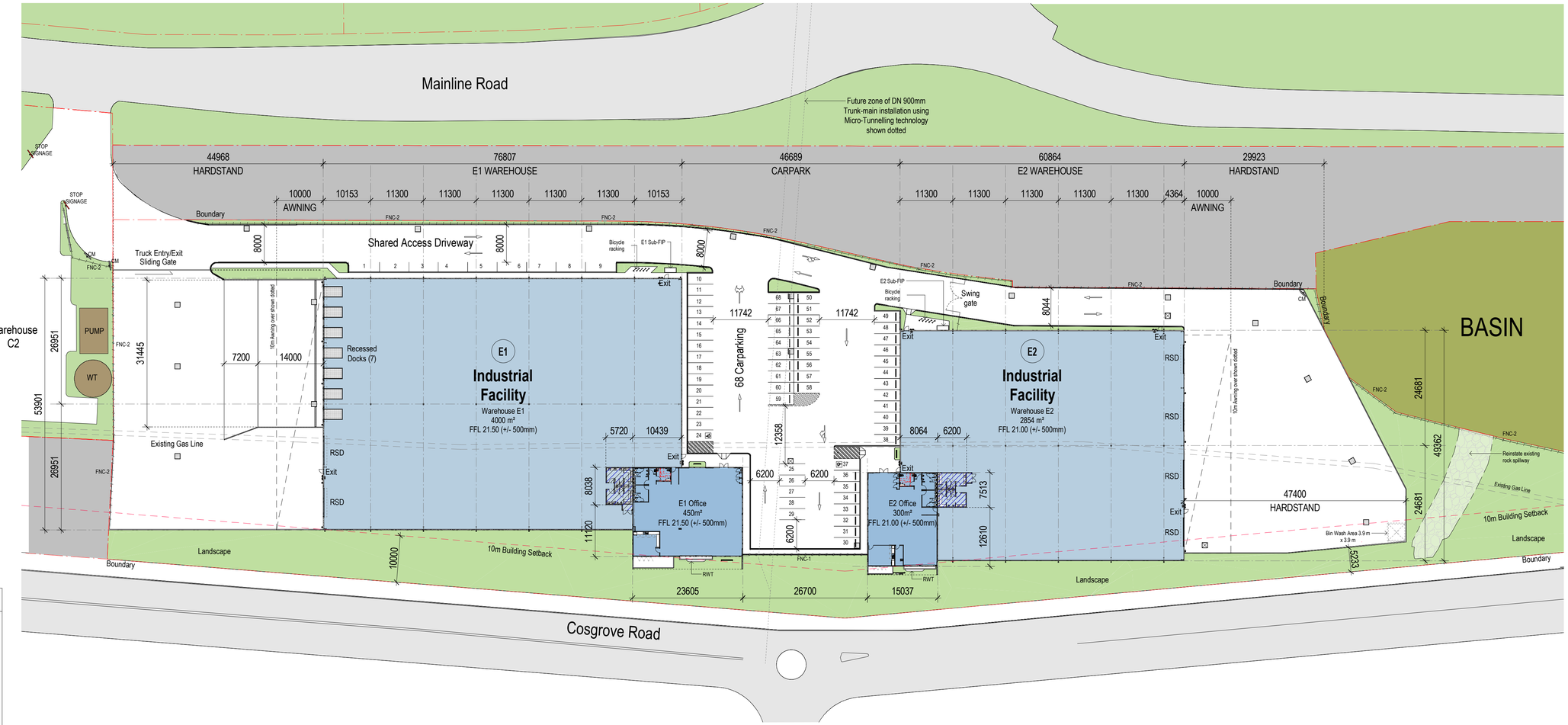
Precinct Site Area	23,440 m² 2.19 ha
Warehouse E1	
Warehouse	4,000 m²
Office E1	450 m²
Total Building Area	4,450 m²
Awning Area	537 m²
Hardstand Area	2,460 m²
Warehouse E2	
Warehouse	2,854m²
Office E2	300 m²
Total Building Area	3,154 m²
Awning Area	468 m²
Hardstand Area	2,192 m²
Total Building Area	7,604 m²
Shared Access Road	2,029 m²
Light duty Areas	2,094m²
Site Cover (exc. awning)	32.5%
Floor Space Ratio	0.32 :1
Landscape Area	6,918m²
Car Spaces	68

Fiout Schedule

- Fitout by tenant
- Base building Modification

SITE LEGEND:

- FNC-1, FENCE TYPE 2/ 1.8m DIPLOMAT BLACK P.C + SPEARTOP
- FNC-2, FENCE TYPE-1/1.8m CHAINMESH BLACK P.C WITH 3 ROWS OF BARDED WIRE
- PEDESTRIAN GATE
- SLIDING GATE
- RW — Retaining Wall
- Site Boundary
- 10m Building Setback
- CM — Convex Mirror



1 PRECINCT 'E' SITE AND FLOOR PLAN

PRELIMINARY

SBA ARCHITECTS | ENFIELD ILC

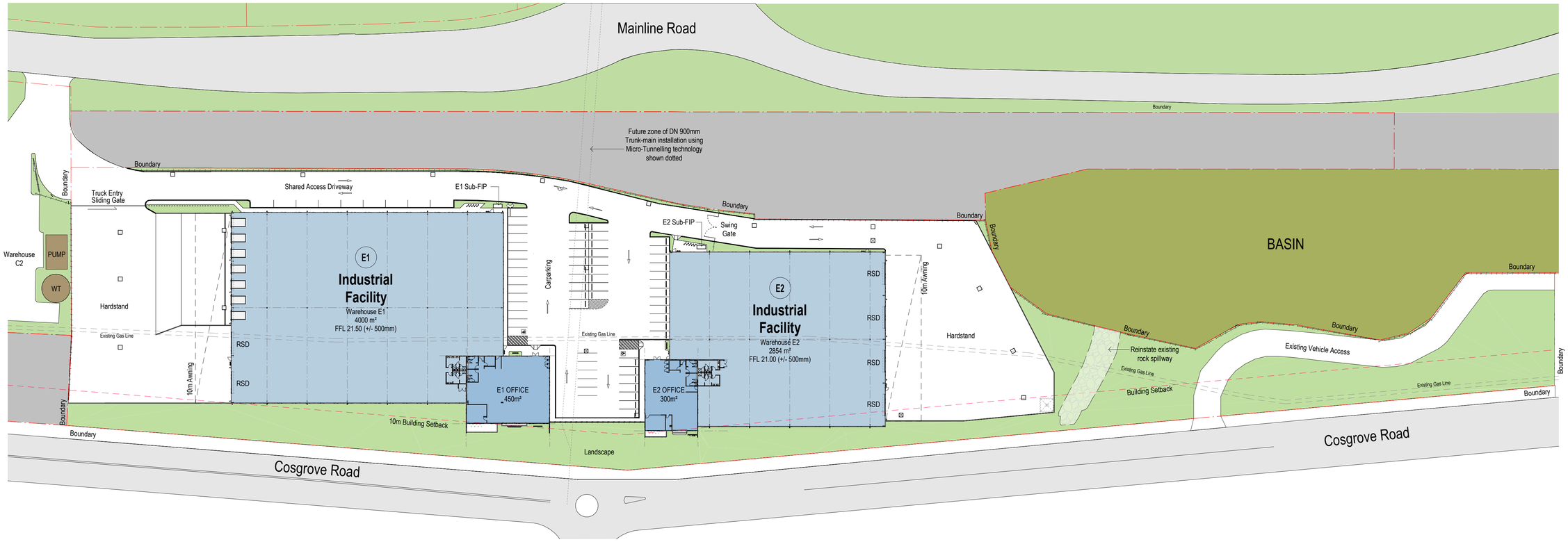
ENFIELD ILC
MAINLINE RD , STRATHFIELD SOUTH

PRECINCT 'E' SITE & FLOOR PLAN

1:500 @A1
1:1000 @A3
07.01.20

EILC DA 40 (3)

NSW Ports in partnership with Goodman



1 OVERALL PRECINCT PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

PRECINCT 'E' OVERALL SITE PLAN

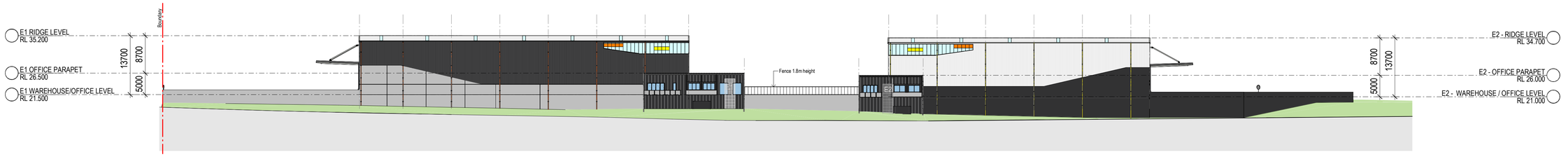
0 600

1:600 @A1
1:1200 @A3

07.01.20

EILC DA 41 (1)

NSW Ports in partnership with Goodman



1 Elevation E1 and E2

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

OVERALL BUILDING ELEVATION

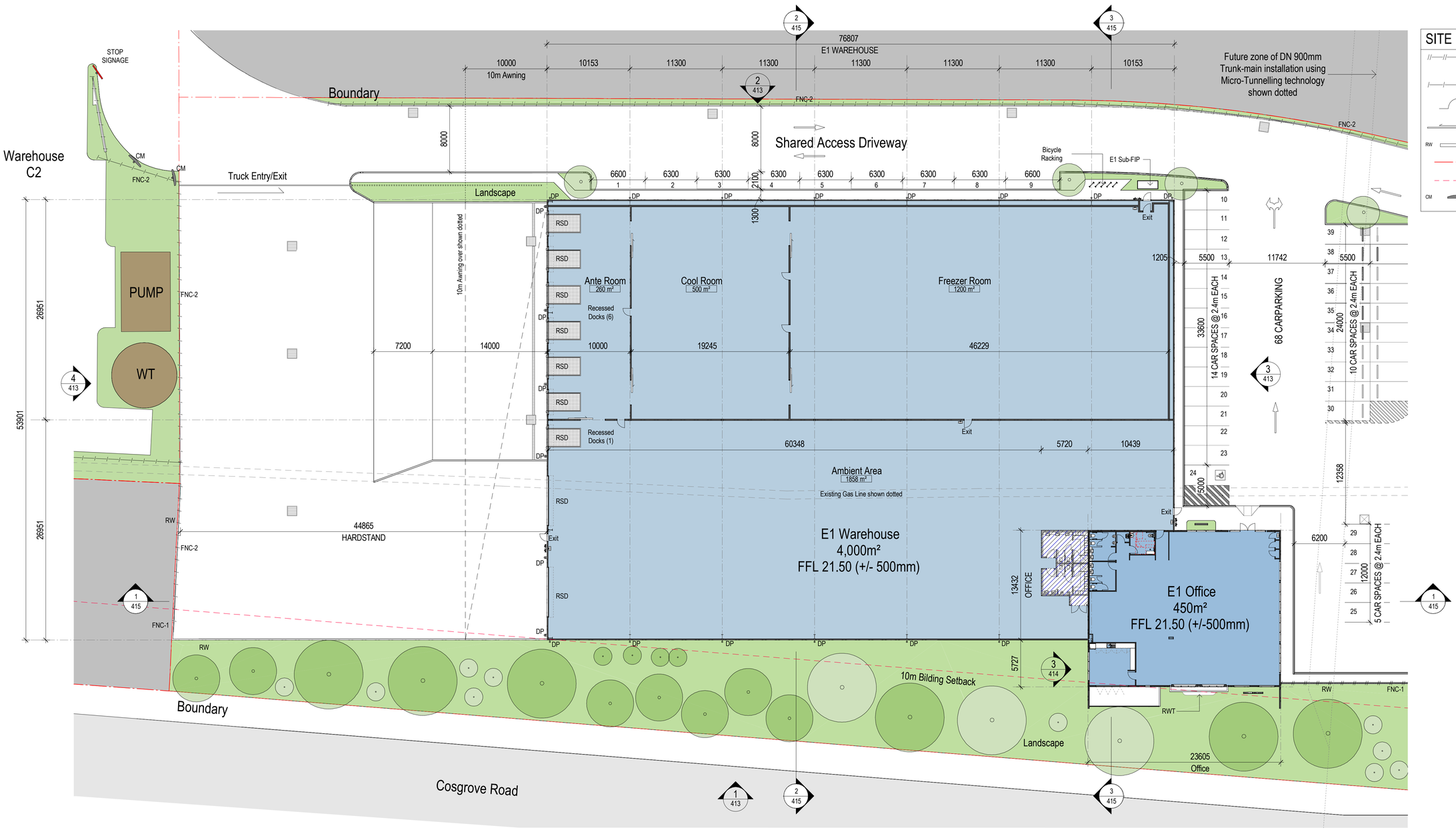
1:500 @A1
1:1000 @A3

0 50

08.01.20

EILC DA 402 (2)

NSW Ports in partnership with Goodman



SITE LEGEND:

- FNC-1, FENCE TYPE 2/ 1.8m DIPLOMAT BLACK P.C + SPEARTOP
- FNC-2, FENCE TYPE-1/1.8m CHAINMESH BLACK P.C WITH 3 ROWS OF BARDED WIRE
- PEDESTRIAN GATE
- SLIDING GATE
- RW — Retaining Wall
- Site Boundary
- 10m Building Setback
- CM — Convex Mirror

Fiout Schedule

- Fitout by tenant
- Base building Modification

1 E1 SITE & FLOOR PLAN

PRELIMINARY

SBA ARCHITECTS | ENFIELD ILC

ENFIELD ILC
MAINLINE RD , STRATHFIELD SOUTH

E1 SITE & FLOOR PLAN

1:250 @A1
1:500 @A3
07.01.20

EILC DA 410 (1)

NSWPorts in partnership with Goodman

Boundary

2/413 2/415

Boundary

EG

MDR MDR

10m Awning

BG

TRS TRS TRS TRS TRS TRS TRS

2.5° FALL

RIDGE LEVEL
RL.35.200

2.0° FALL

2.5° FALL

TRS TRS TRS TRS TRS TRS TRS TRS

INDICATIVE SOLAR SYSTEM LAYOUT

1.0°

BG

BG MDR

3/413

1/415

MDR

SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP

EG

BG

2.5° FALL

1/415

Boundary

10m Building Setback

10000

Boundary

ROOF LEGEND	
MDR	METAL ROOF SHEET
TRS	TRANSLUCENT ROOF SHEET
BG	BOX GUTTER
EG	EAVES GUTTER
SP	50 KW SOLAR SYSTEM

1 E1 ROOF PLAN

1/413 2/415

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E1 ROOF PLAN

0 20

1:200 @A1
1:400 @A3

07.01.20

EILC DA 411 (1)

NSW Ports in partnership with Goodman

Office Area Schedule	
Office E1	
Total Area	450 sqm
Fitout by tenant	
Base building Modification	

1 E1 OFFICE FLOOR PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

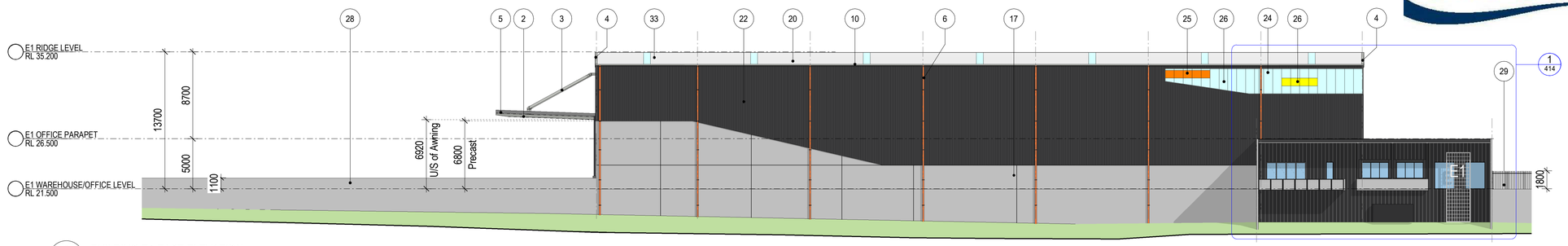
MAINLINE RD , STRATHFIELD SOUTH

E1 OFFICE FLOOR PLAN

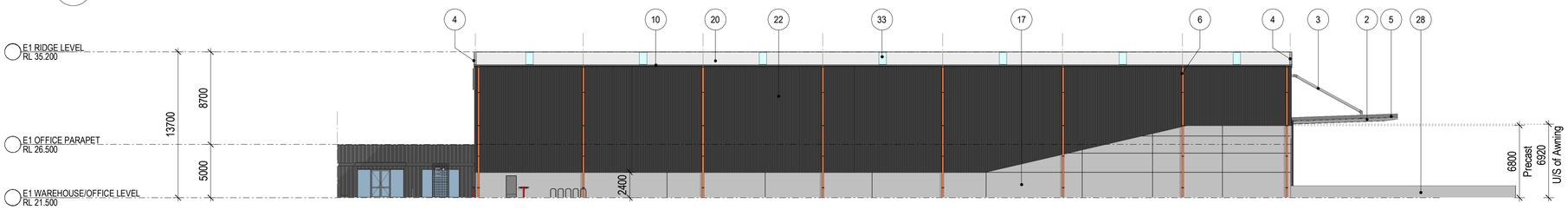
1:100 @A1
1:200 @A3

07.01.20

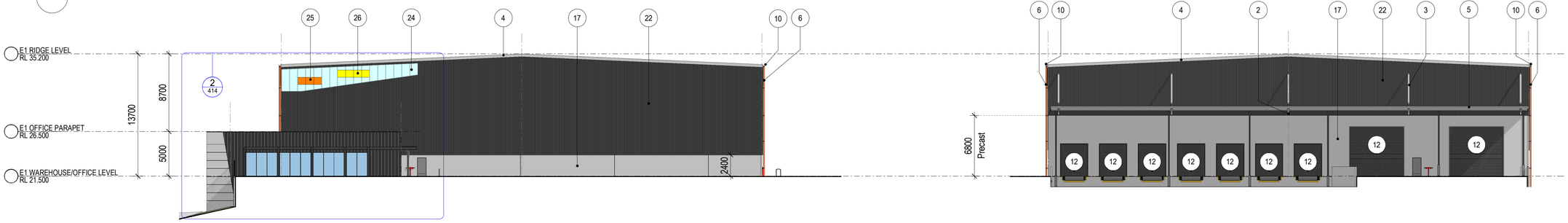
EILC DA 412 (1)



1 BUILDING E1-EAST ELEVATION



2 BUILDING E1-WEST ELEVATION



3 BUILDING E1-NORTH ELEVATION

4 BUILDING E1-SOUTH ELEVATION

FINISHES SCHEDULE E1- SCHEME A

	Material	Finish /Profile	Colour Scheme A-Dark
1	Aluminium Framed Glazing System	Powdercoat	Black Satin
2	Awning Steel Structure	Paint Finish	Dulux Shale Grey
3	Awning Struct	Paint Finish	Dulux Shale Grey
4	Prefinished Metal Capping/Flashing - Type 1	Colorbond	Shale Grey
5	Prefinished Metal Capping/Flashing - Type 2	Colorbond	Monument
6	Prefinish Metal Downpipes	Paint Finish	Orange
7	Garden feature wall	Garden wall double sided, steel frame & Grid	Black Satin
8	External Paver - Type 1	Outdoor Paving	Lightly Exposed Aggregate Concrete Walkways
9	Glazing	Performance Double Glazing Section J	Blue Tinted Glass
10	Prefinish Metal Gutter	Colorbond	Shale Grey
11	Off Form Concrete Planter Box	Natural Finish	
12	Metal Roller Shutter Doors	Paint Finish	Monument
13	Office Roof Soffit Lining	Paint Finish	Pure White
14	Precast Concrete with Expressed Joints	Natural Finish	
15	Office Profiled Metal Wall Cladding	Fielders Prominence Finesse 265mm Wide Pan	Monument
16	PFC Surround to Roller Shutter Doors	Paint Finish	Colorbond Monument

	Material	Finish/Profile	Colour Scheme A-Dark
17	Precast Concrete Panels - Type 1	Natural Finish	Natural
18	Precast Concrete Panels - Type 2	Impregnated Colour Precast	Monument
19	Profiled Glazing Reveals	Folded Meta Reveals	Black Satin
20	Profiled Metal Roof Sheeting - Type 1	Prefinish Metal Roof Sheeting	Colorbond Surfmist
21	Profiled Metal Roof Sheeting - Type 2 (Office Entry Awnings)	Prefinish Metal Roof Sheeting	Colorbond Monument
22	Profiled Metal Wall Cladding (Warehouse)	Prefinish Metal Wall Sheeting	Colorbond Monument
23	Spandrel	Colour back glass	Ceramic Frit-Colour: Frosted White Dots
24	Translucent Wall Cladding	Danpalon	Clear
25	Translucent Film	Avery Dennison	Sunset Orange
26	Translucent Film	Avery Dennison	Citrus Yellow
27	Warehouse Steel Structure	Paint Finish	Dulux Zeus Silver Grey
28	Retaining Wall		Refer to Civil's details
29	Outdoor Balustrade - Type perforated steel	Powdercoat	Dulux Black Satin
30	External Stairs	Off form concrete, w/alum. nosing	Natural Finish
31	Office Exposed Steel Structure	Paint Finish	Dulux Black Satin
32	Steel - RWT / Louvres	Powdercoated	Monument
33	Translucent Roof Sheeting	To Match Roof Sheeting Profile	Opal

PRELIMINARY

SBA ARCHITECTS | ENFIELD ILC

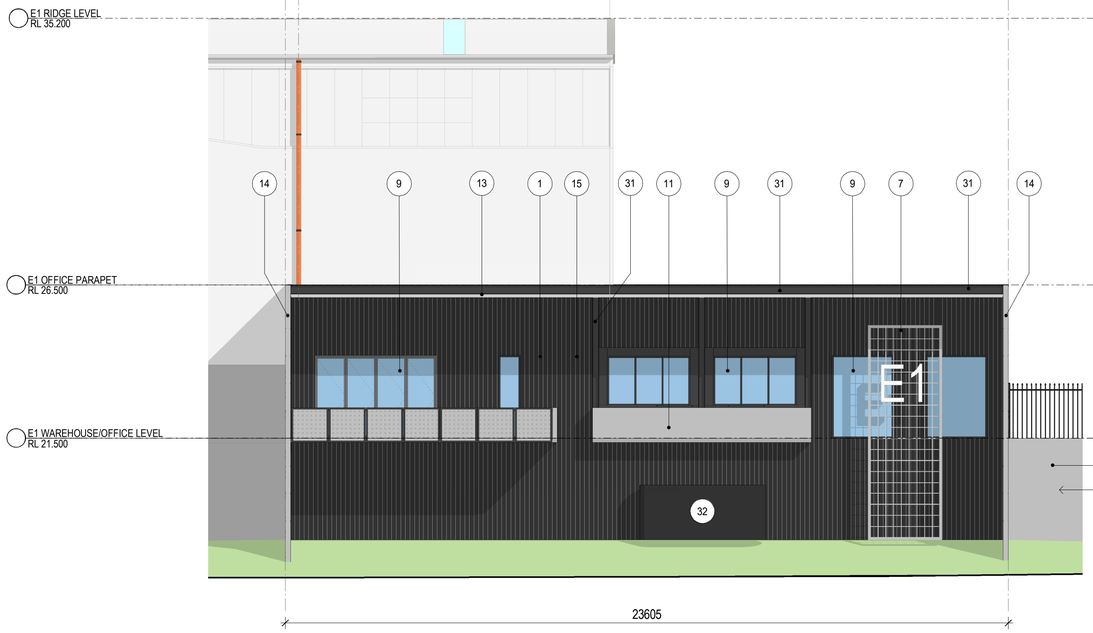
ENFIELD ILC
MAINLINE RD , STRATHFIELD SOUTH

E1 BUILDING ELEVATIONS

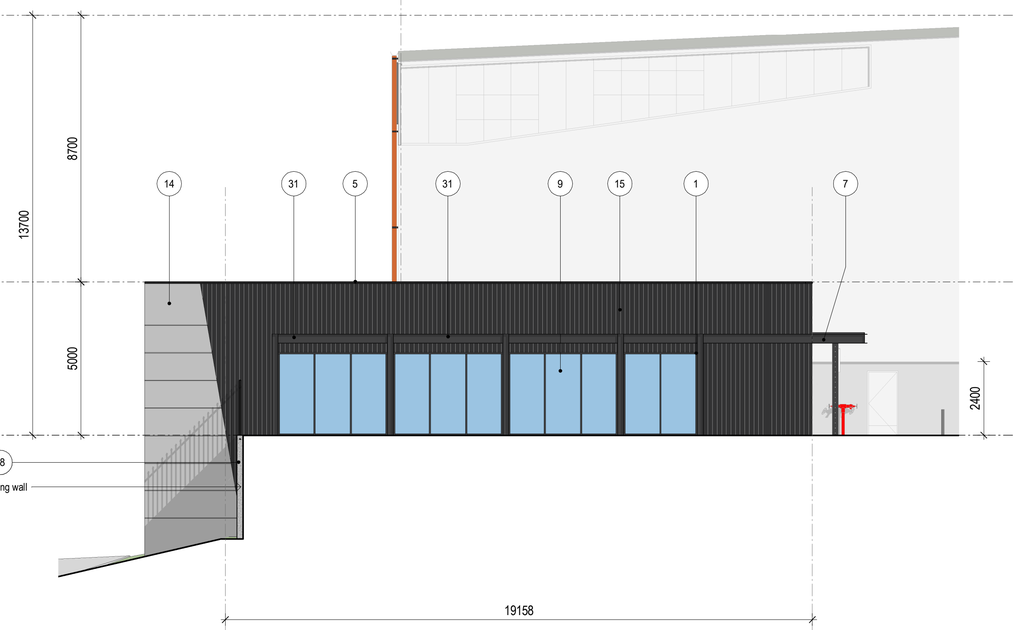
1:250 @A1
1:500 @A3
07.01.20

EILC DA 413 (1)

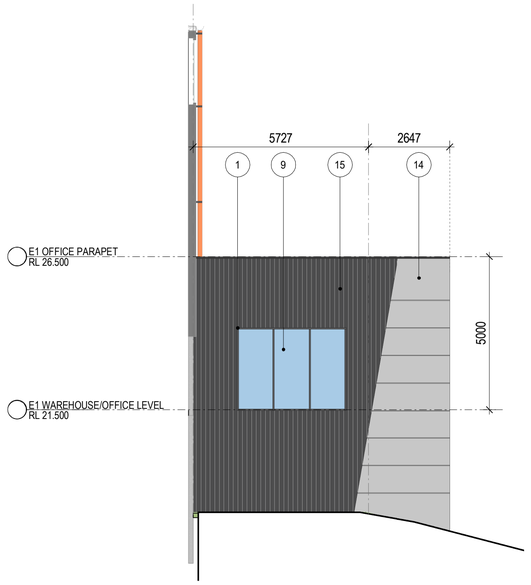
NSWPorts in partnership with Goodman



1 OFFICE E1- EAST ELEVATION



2 OFFICE E1- NORTH ELEVATION



3 OFFICE E1-SOUTH ELEVATION

4 OFFICE E1 PERSPECTIVE

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

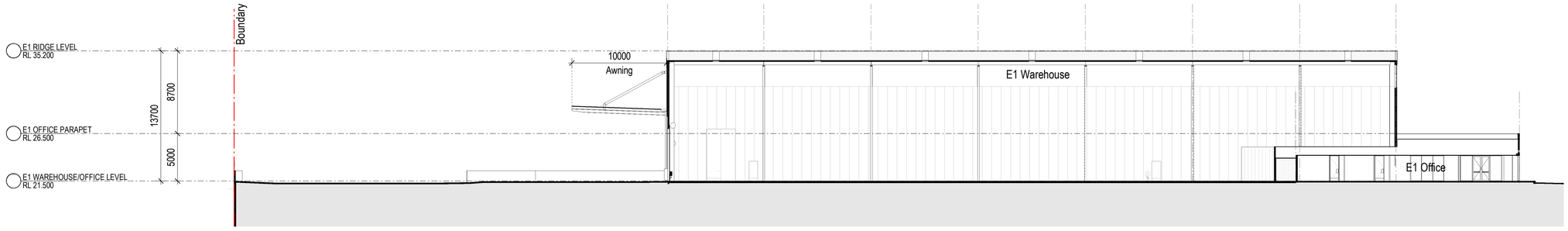
E1 OFFICE ELEVATIONS

0 10

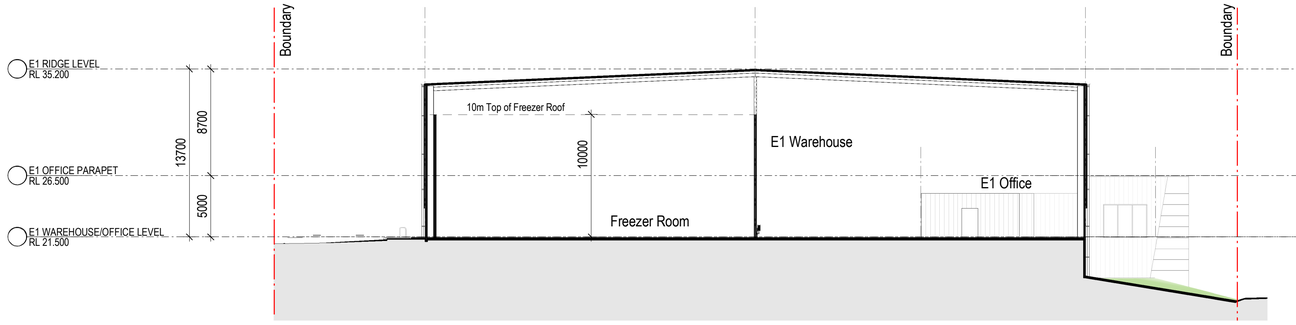
1:100 @A1
1:200 @A3

07.01.20

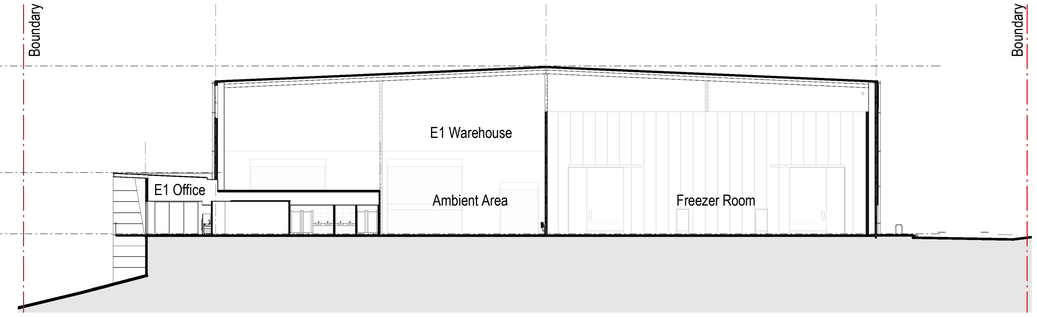
EILC DA 414 (1)



1 E1 WAREHOUSE & OFFICE - SECTION



2 E1 WAREHOUSE - SECTION



3 E1 OFFICE - SECTION

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E1 OVERALL SECTIONS

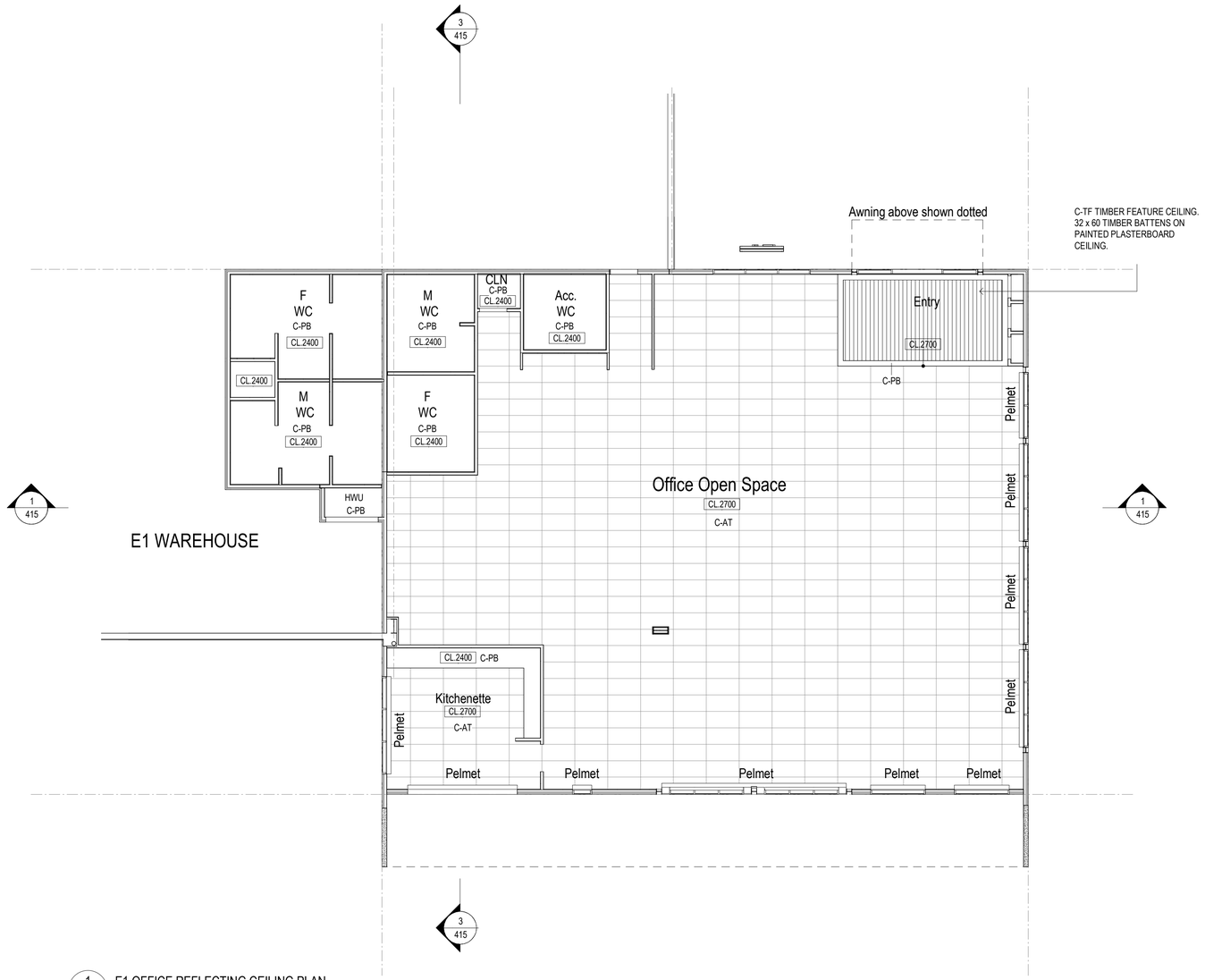
1:250 @A1
1:500 @A3

0 25

07.01.20

EILC DA 415 (1)

NSW Ports in partnership with Goodman



1 E1 OFFICE REFLECTING CEILING PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E1 OFFICE REFLECTED CEILING PLAN

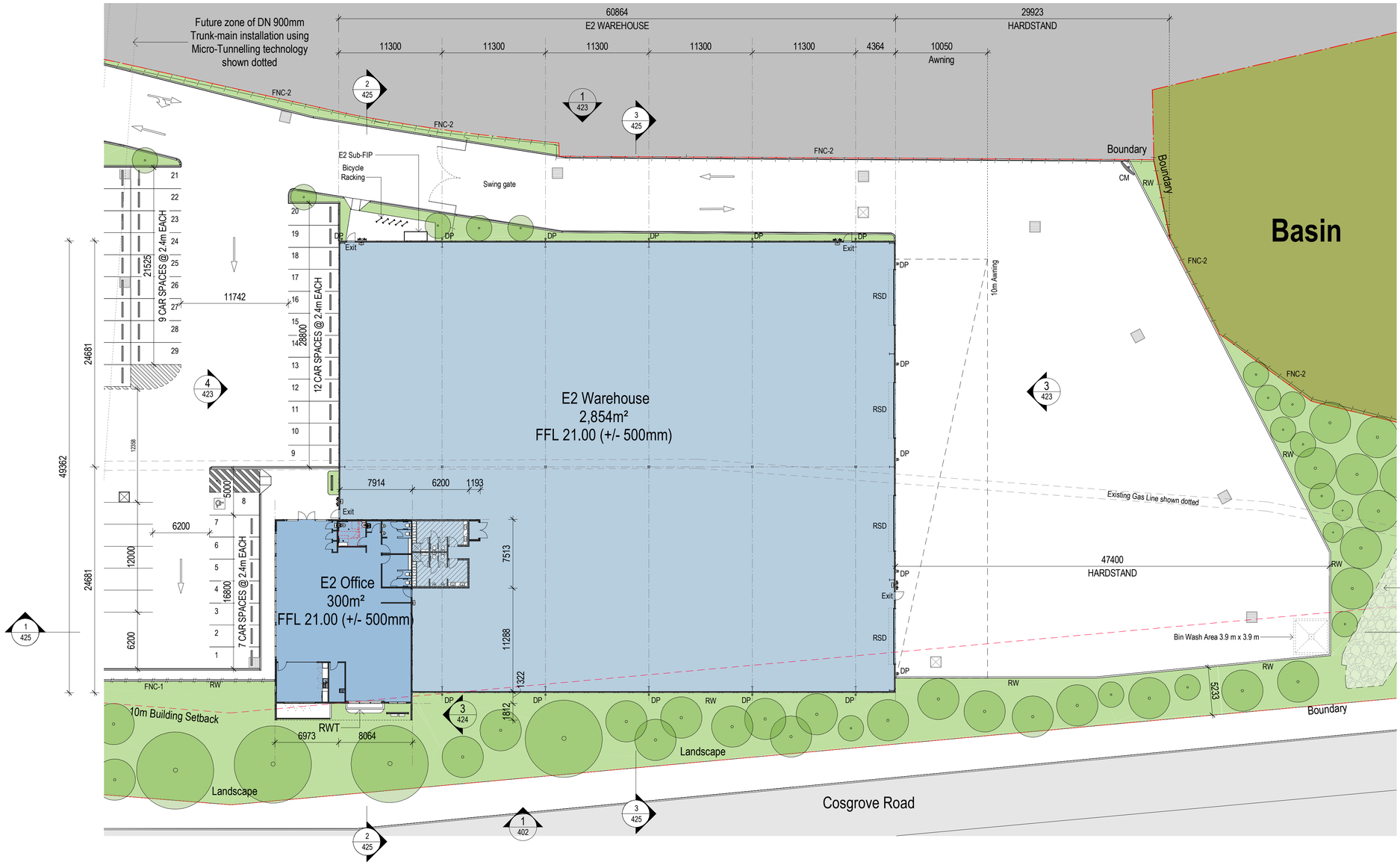
1:100 @ A1
1:200 @ A3

0 10

07.01.20

EILC DA 416 (1)

NSW Ports in partnership with Goodman



SITE LEGEND:

- FNC-1, FENCE TYPE 2/ 1.8m DIPLOMAT BLACK P.C + SPEARTOP
- FNC-2, FENCE TYPE-1/1.8m CHAINMESH BLACK P.C WITH 3 ROWS OF BARDED WIRE
- PEDESTRIAN GATE
- SLIDING GATE
- RW — Retaining Wall
- Site Boundary
- 10m Building Setback
- CM — Convex Mirror

Fiout Schedule

Fitout by tenant	
Base building Modification	

1 E2 SITE & FLOOR PLAN.

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E2 SITE & FLOOR PLAN

1:250 @A1
1:500 @A3

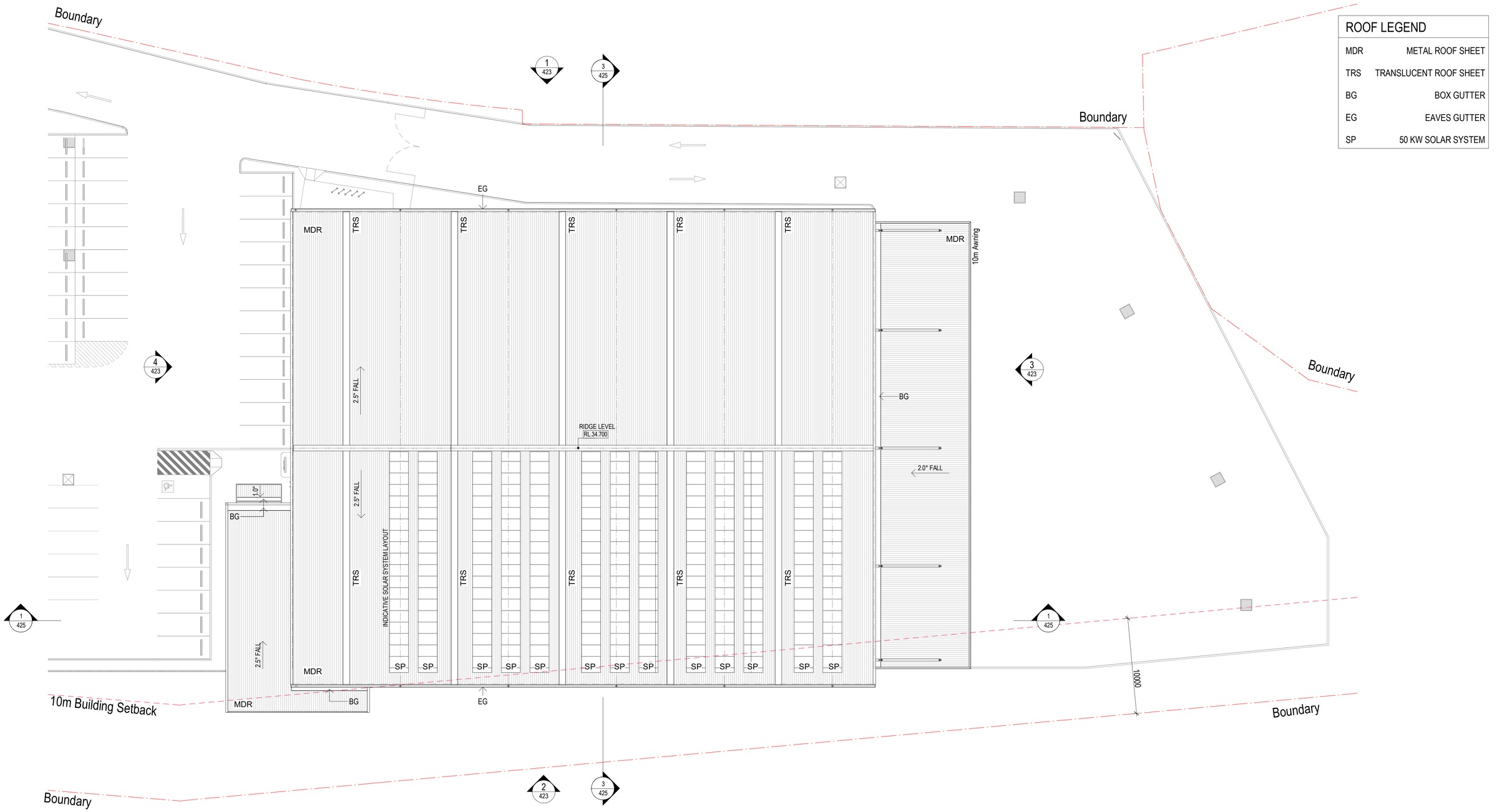
0 25

07.01.20

EILC DA 420 (1)

NSWPorts in partnership with Goodman

ROOF LEGEND	
MDR	METAL ROOF SHEET
TRS	TRANSLUCENT ROOF SHEET
BG	BOX GUTTER
EG	EAVES GUTTER
SP	50 KW SOLAR SYSTEM



1 E2 ROOF PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E2 ROOF PLAN

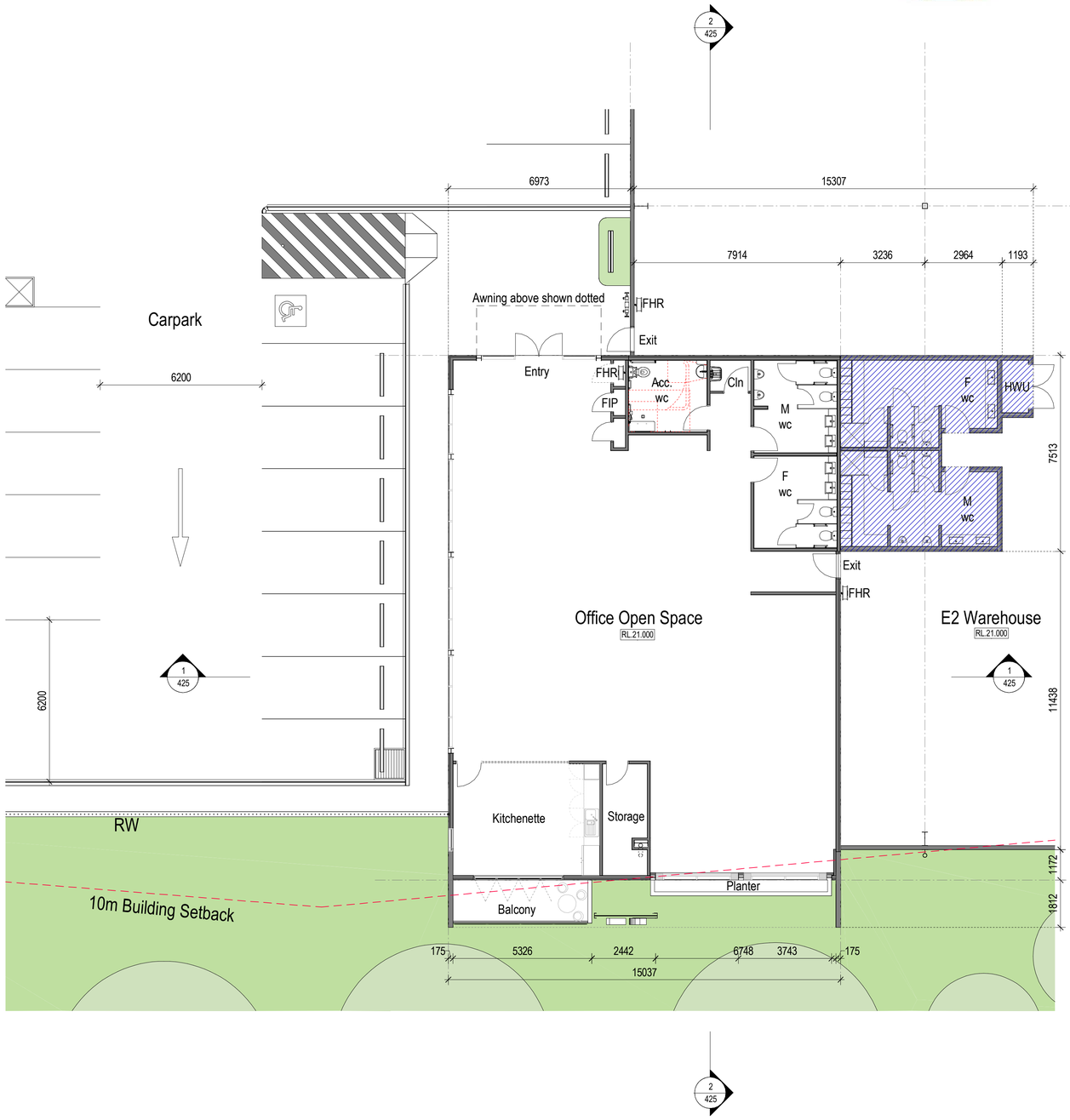
0 20

1:200 @A1
1:400 @A3

07.01.20

EILC DA 421 (1)

NSWPorts in partnership with Goodman



Office Area Schedule	
Office E2	
Total Area	300 sqm

1 E2 OFFICE FLOOR PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

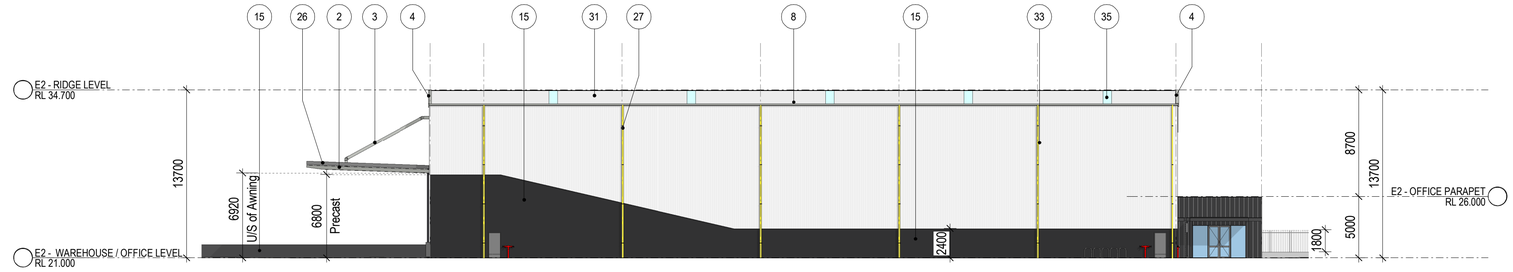
E2 OFFICE FLOOR PLAN

0 10

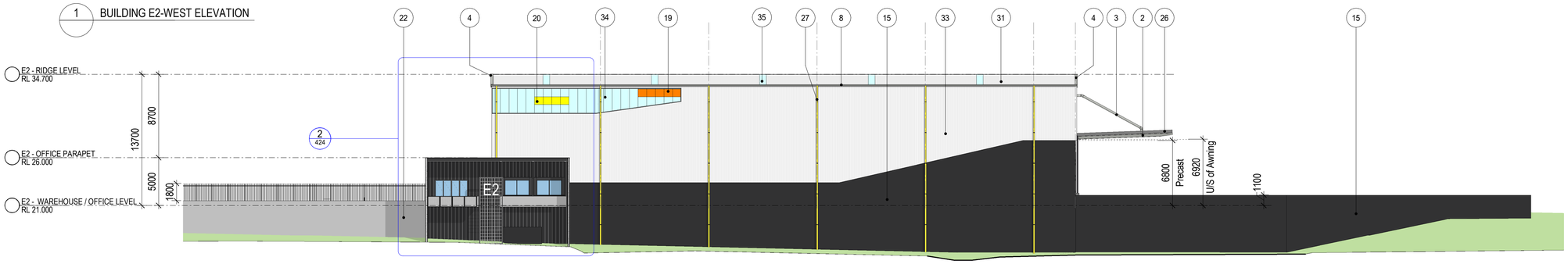
1:100 @A1
1:200 @A3

08.01.20

EILC DA 422 (2)

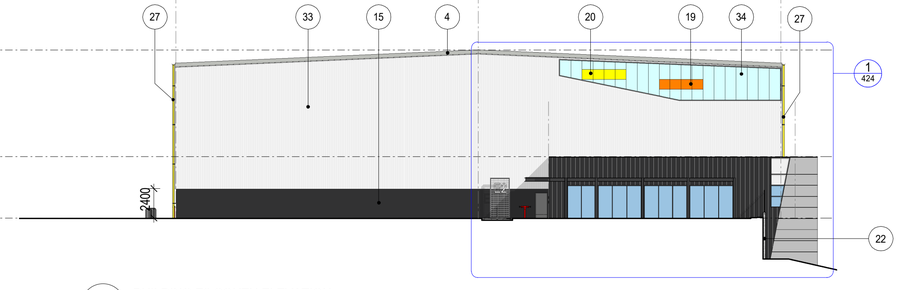


1 BUILDING E2-WEST ELEVATION



2 BUILDING E2-EAST ELEVATION

3 BUILDING E2-NORTH ELEVATION



4 BUILDING E2-SOUTH ELEVATION

FINISHES SCHEDULE E2- SCHEME B

	Material	Finish /Profile	Colour Scheme A-Dark
1	Aluminium Framed Glazing System	Powdercoat	Black Satin
2	Awning Steel Structure	Paint Finish	Dulux Shale Grey
3	Awning Struct	Paint Finish	Dulux Shale Grey
4	Prefinished Metal Capping/Flashing - Type 1	Colorbond	Shale Grey
5	Garden feature wall	Garden wall double sided, steel frame & Grid	Black Satin
6	External Paver - Type 1	Outdoor Paving	Lightly Exposed Aggregate Concrete Walkways
7	Glazing	Performance Double Glazing Section J	Blue Tinted Glass
8	Prefinish Metal Gutter	Colorbond	Shale Grey
9	Off Form Concrete Planter Box	Natural Finish	
10	Office Roof Soffit Lining	Paint Finish	Pure White
11	Precast Concrete with Expressed Joints	Natural Finish	
12	Office Profiled Metal Wall Cladding	Fielders Prominence Finesse 265mm Wide Pan	Colorbond Monument
13	Metal Roller Shutter Doors	Paint Finish	Dulux Monument (Not in use)
14	Precast Concrete Panels - Type 1	Precast	Natural Finish
15	Precast Concrete Panels - Type 2	Impregnated Colour Precast	Monument
16	Profiled Glazing Reveals	Folded Meta Reveals	Black Satin
17	Profiled Metal Wall Cladding	Prefinish Metal Wall Sheeting	Colorbond Monument (Not in use)

	Material	Finish/Profile	Colour Scheme A-Dark
18	Spandrel	Colour back glass	Ceramic Frit-Colour: Frosted White Dots
19	Translucent Film	Avery Dennison	Sunset Orange
20	Translucent Film	Avery Dennison	Citrus Yellow
21	Warehouse Steel Structure	Paint Finish	Dulux Zeus Silver Grey
22	Retaining Wall		Refer to Civil's details
23	Outdoor Balustrade - Type perforated steel	Powdercoat	Dulux Black Satin
24	External Stairs	Off form concrete, w/alum. nosing	Natural Finish
25	Office Exposed Steel Structure	Paint Finish	Dulux Black Satin
26	Prefinished Metal Capping/Flashing - Type 2	Colorbond	Basalt
27	Prefinish Metal Downpipes	Paint Finish	Yellow
28	Metal Roller Shutter Doors	Paint Finish	Dulux Basalt Grey
29	PFC Surround to Roller Shutter Doors	Paint Finish	Dulux Basalt Grey
30	Precast Concrete Panels	Impregnated Colour Precast	Dulux Surfmist
31	Profiled Metal Roof Sheeting	Prefinish Metal Roof Sheeting	Colorbond Surfmist
32	Profiled Metal Roof Sheeting - Type 2 (Office Entry Awnings)	Prefinish Metal Roof Sheeting	Colorbond Basalt
33	Profiled Metal Wall Cladding (Warehouse)	Prefinish Metal Wall Sheeting	Colorbond Surfmist

	Material	Finish/Profile	Colour Scheme A-Dark
34	Translucent Wall Cladding	Danpalon	Clear
35	Translucent Roof Sheeting	To Match Roof Sheeting Profile	Opal
36	Steel - RWT / Louvres	Powdercoated	Monument

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

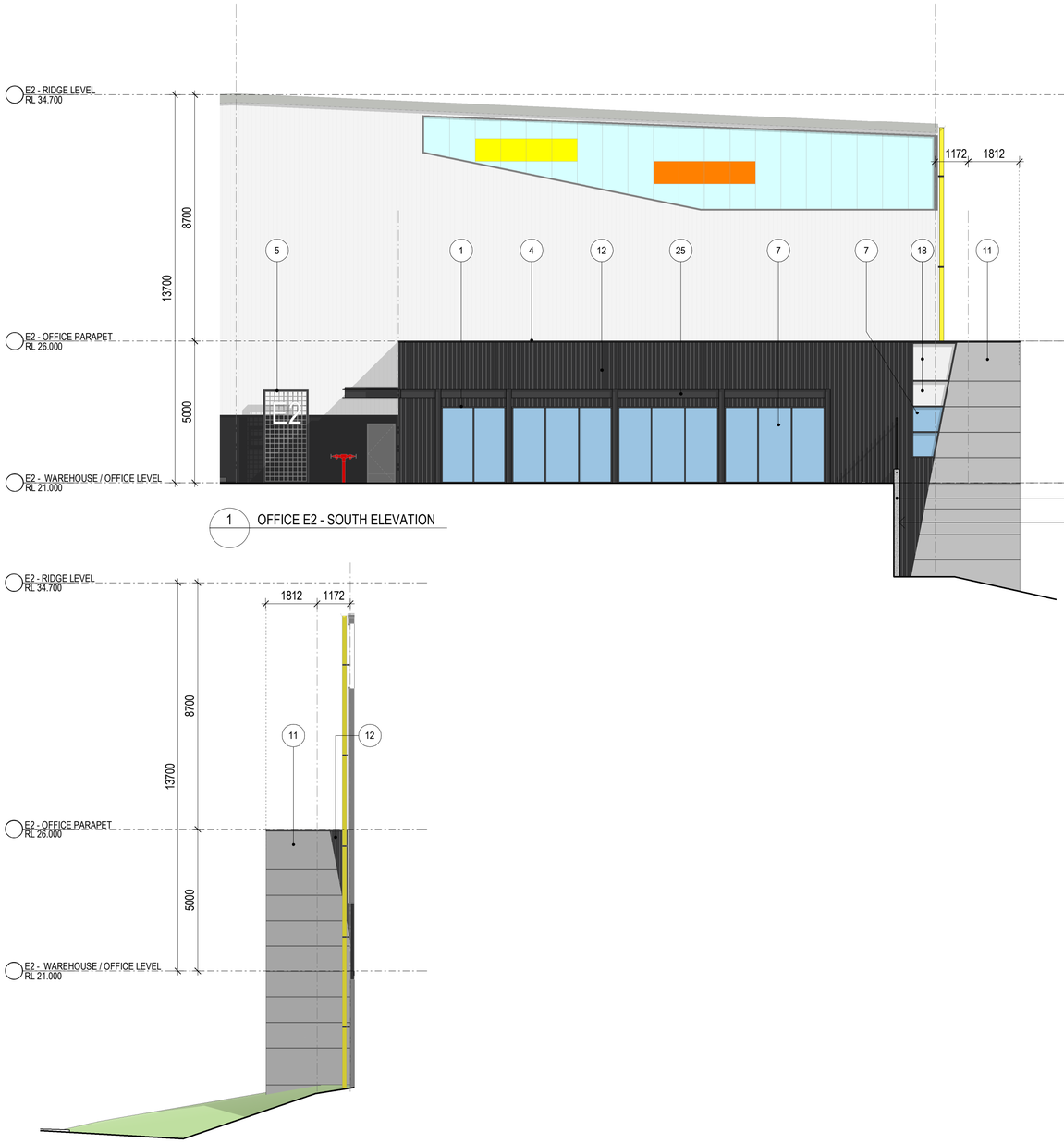
E2 BUILDING ELEVATIONS

1:250 @A1
1:500 @A3

08.01.20

EILC DA 423 (2)

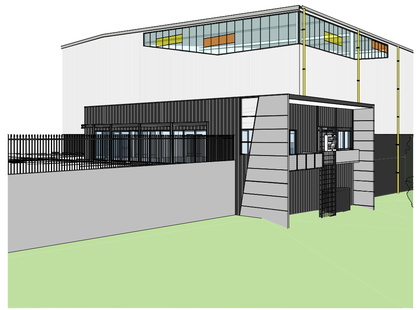
NSW Ports in partnership with Goodman



1 OFFICE E2 - SOUTH ELEVATION

2 OFFICE E2 - EAST ELEVATION

3 OFFICE E2 - NORTH ELEVATION



4 E2 OFFICE PERSPECTIVE

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

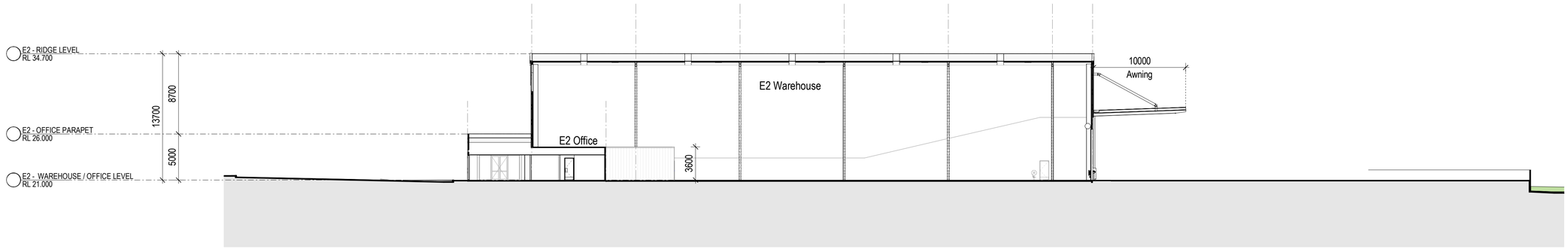
E2 OFFICE ELEVATIONS

1:100 @A1
1:200 @A3

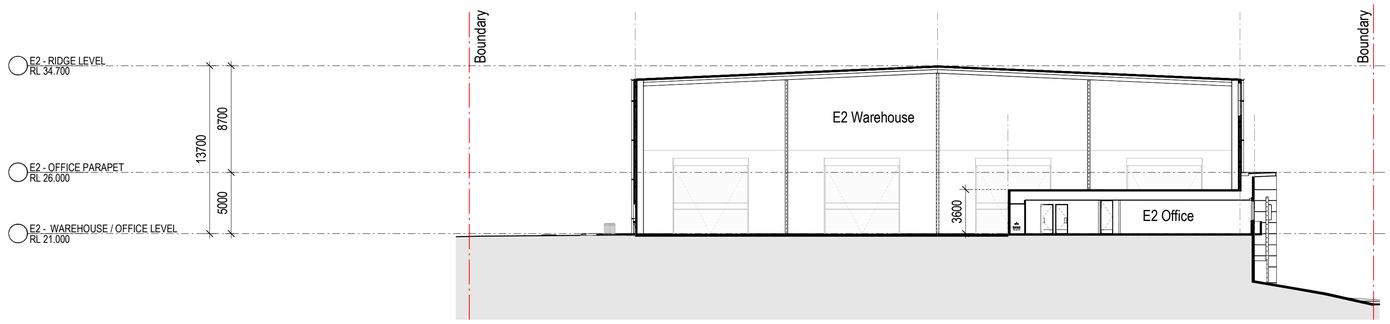
08.01.20

EILC DA 424 (2)

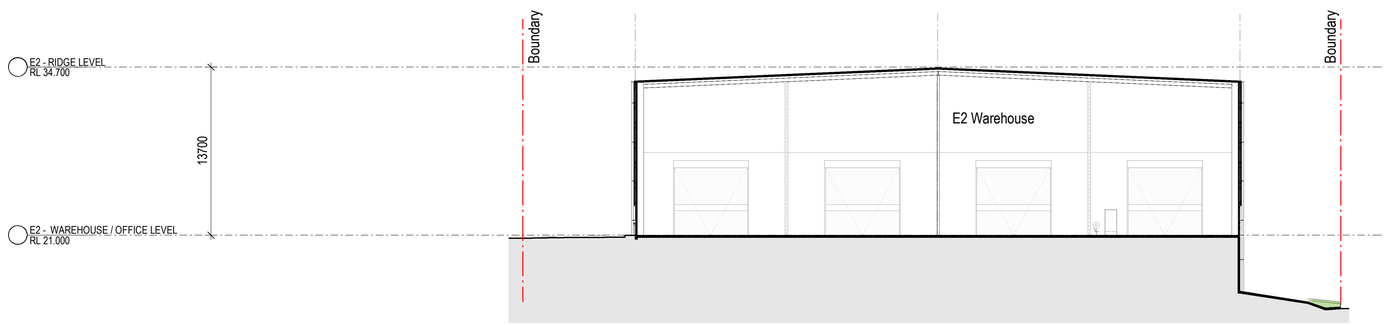
NSW Ports in partnership with Goodman



1 E2 WAREHOUSE & OFFICE - SECTION



2 E2 OFFICE - SECTION



3 E2 WAREHOUSE - SECTION

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

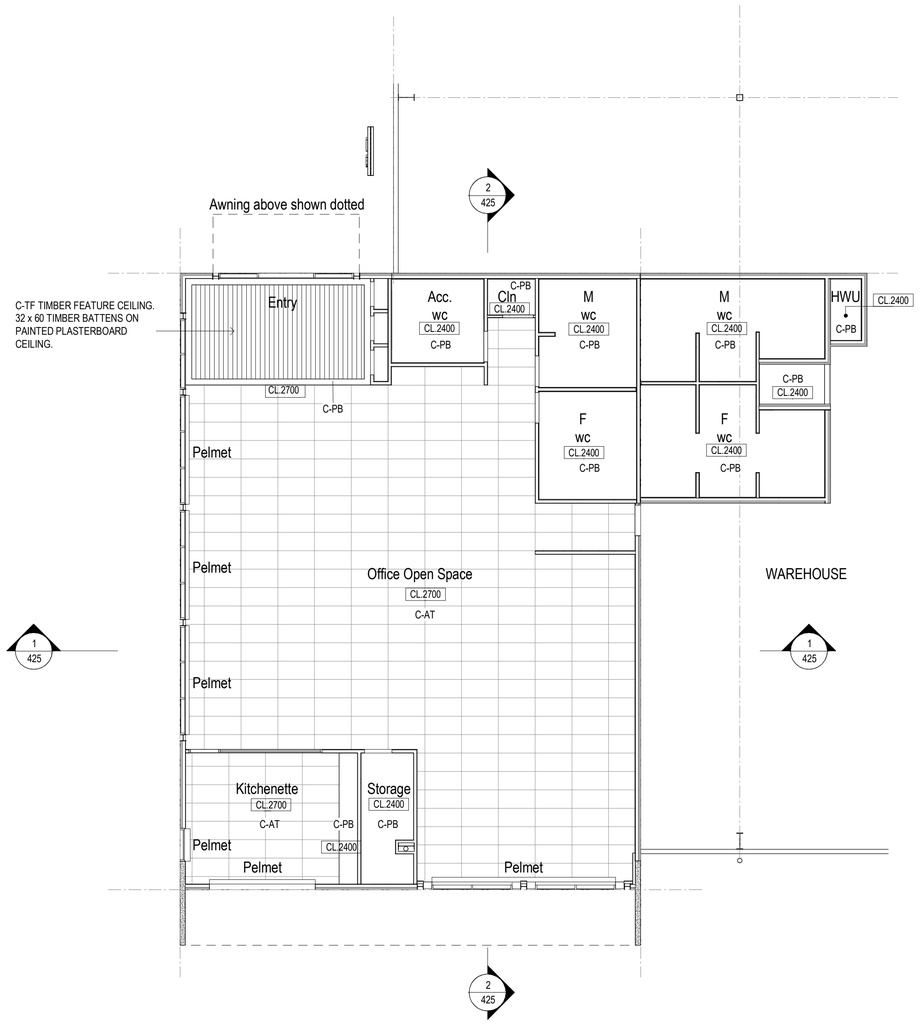
E2 OVERALL SECTIONS

1:250@A1
1:500@A3

0 25

07.01.20

EILC DA 425 (1)



1 E2 OFFICE REFLECTED CEILING PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E2 OFFICE REFLECTED CEILING PLAN

0 10

1:100 @ A1
1:200 @ A3

08.01.20

EILC DA 426 (2)

PROPOSED ENFIELD INTERMODAL LOGISTICS CENTRE

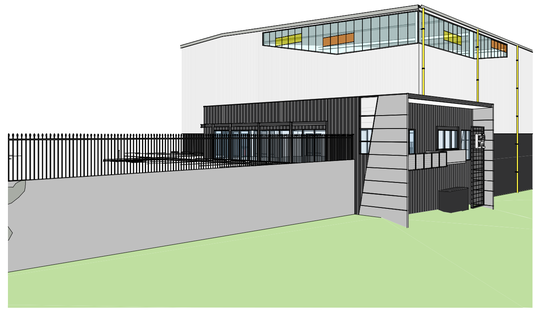
PRECINCT E

Drawing List

EILC DA 40	PRECINCT 'E' SITE & FLOOR PLAN
EILC DA 41	PRECINCT 'E' OVERALL SITE PLAN
EILC DA 402	OVERALL BUILDING ELEVATION
EILC DA 410	E1 SITE & FLOOR PLAN
EILC DA 411	E1 ROOF PLAN
EILC DA 412	E1 OFFICE FLOOR PLAN
EILC DA 413	E1 BUILDING ELEVATIONS
EILC DA 414	E1 OFFICE ELEVATIONS
EILC DA 415	E1 OVERALL SECTIONS
EILC DA 416	E1 OFFICE REFLECTED CEILING PLAN
EILC DA 420	E2 SITE & FLOOR PLAN
EILC DA 421	E2 ROOF PLAN
EILC DA 422	E2 OFFICE FLOOR PLAN
EILC DA 423	E2 BUILDING ELEVATIONS
EILC DA 424	E2 OFFICE ELEVATIONS
EILC DA 425	E2 OVERALL SECTIONS
EILC DA 426	E2 OFFICE REFLECTED CEILING PLAN

NSW Ports in partnership with Goodman

1 E1 OFFICE PERSPECTIVE



2 E2 OFFICE PERSPECTIVE

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

PRECINCT 'E' COVER SHEET

NTS

07.01.20

EILC DA 0 (1)

NSW Ports in partnership with Goodman

Precinct E Area Schedule

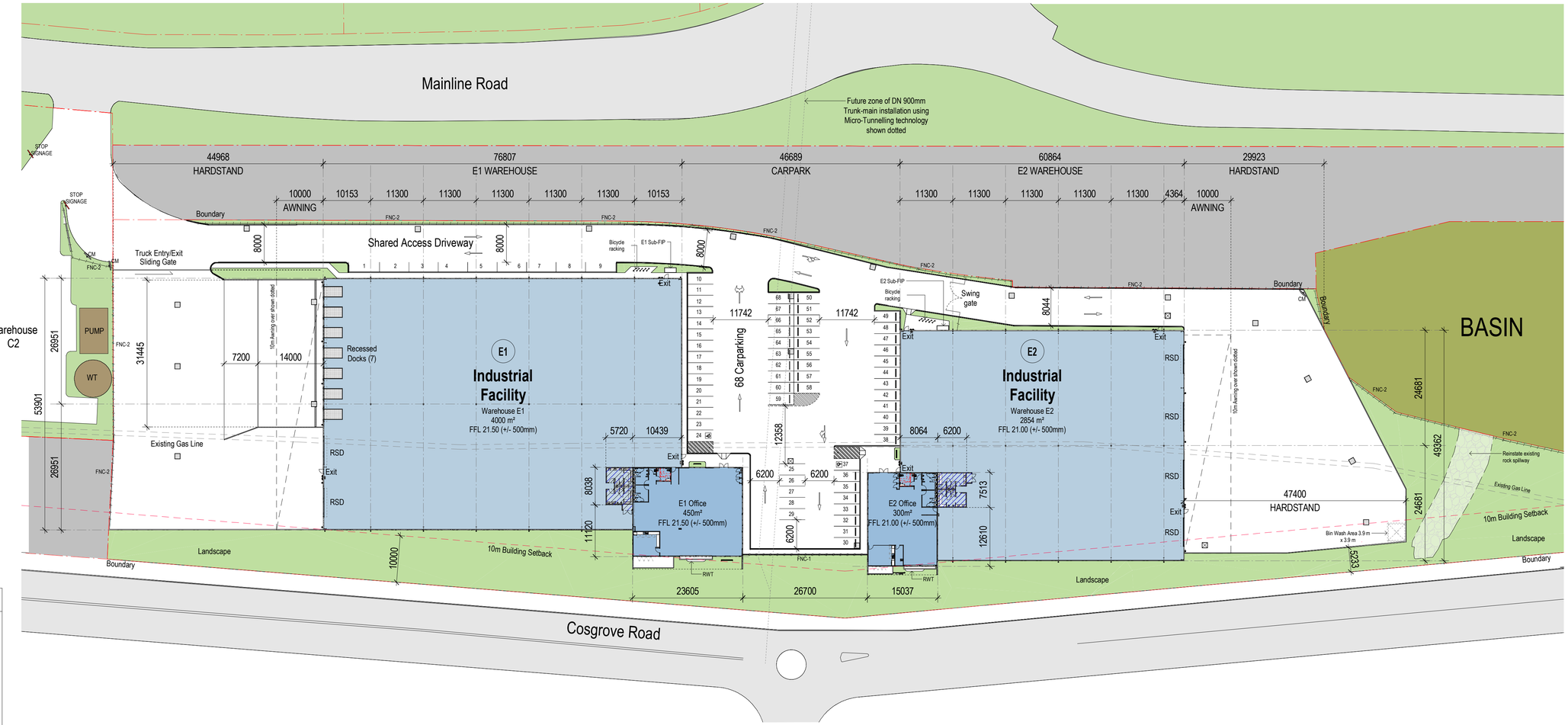
Precinct Site Area	23,440 m² 2.19 ha
Warehouse E1	
Warehouse	4,000 m²
Office E1	450 m²
Total Building Area	4,450 m²
Awning Area	537 m²
Hardstand Area	2,460 m²
Warehouse E2	
Warehouse	2,854m²
Office E2	300 m²
Total Building Area	3,154 m²
Awning Area	468 m²
Hardstand Area	2,192 m²
Total Building Area	7,604 m²
Shared Access Road	2,029 m²
Light duty Areas	2,094m²
Site Cover (exc. awning)	32.5%
Floor Space Ratio	0.32 :1
Landscape Area	6,918m²
Car Spaces	68

Fiout Schedule

- Fitout by tenant
- Base building Modification

SITE LEGEND:

- FNC-1, FENCE TYPE 2/ 1.8m DIPLOMAT BLACK P.C + SPEARTOP
- FNC-2, FENCE TYPE-1/1.8m CHAINMESH BLACK P.C WITH 3 ROWS OF BARDED WIRE
- PEDESTRIAN GATE
- SLIDING GATE
- RW — Retaining Wall
- Site Boundary
- 10m Building Setback
- CM — Convex Mirror



1 PRECINCT 'E' SITE AND FLOOR PLAN

PRELIMINARY

SBA ARCHITECTS | ENFIELD ILC

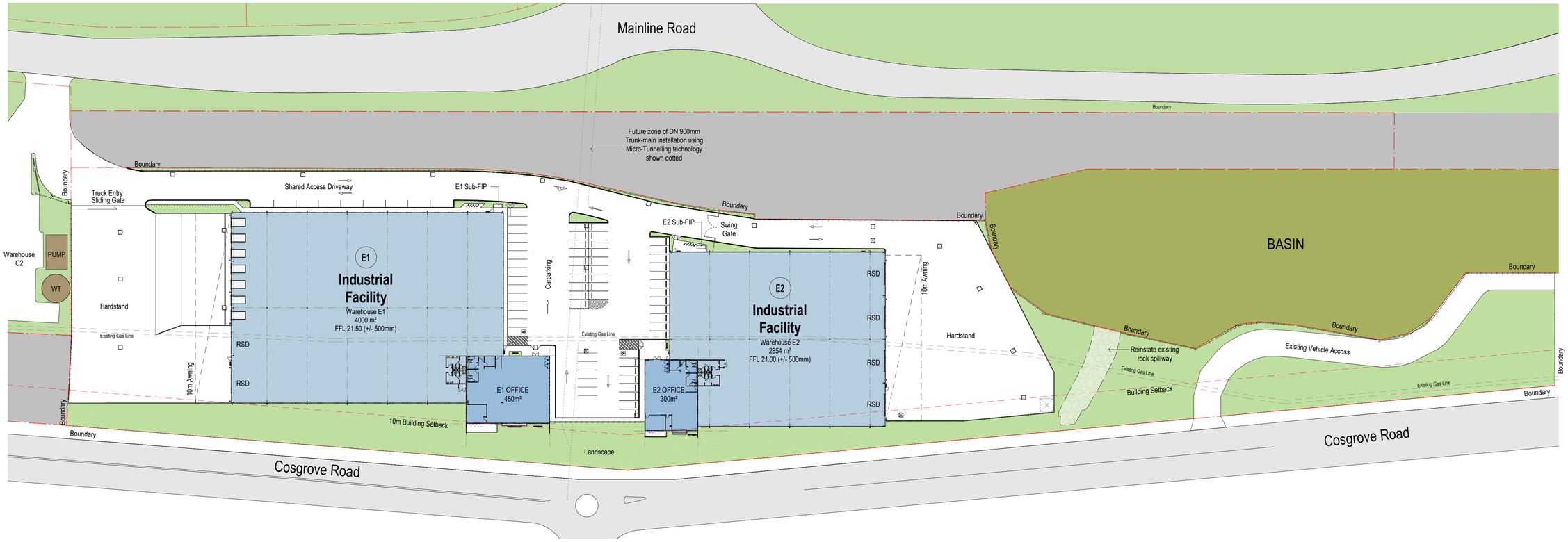
ENFIELD ILC
MAINLINE RD , STRATHFIELD SOUTH

PRECINCT 'E' SITE & FLOOR PLAN

1:500 @A1
1:1000 @A3
07.01.20

EILC DA 40 (3)

NSW Ports in partnership with Goodman



1 OVERALL PRECINCT PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

PRECINCT 'E' OVERALL SITE PLAN

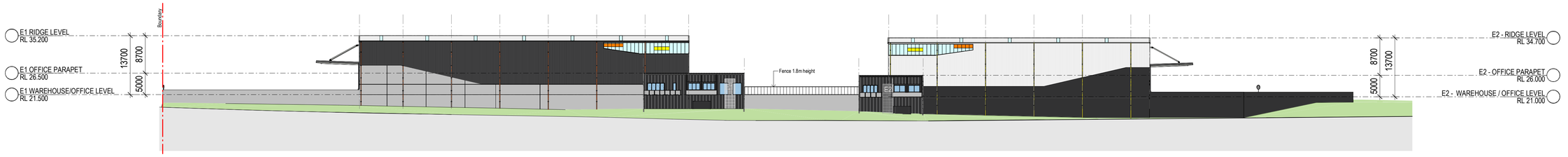
0 600

1:600 @A1
1:1200 @A3

07.01.20

EILC DA 41 (1)

NSW Ports in partnership with Goodman



1 Elevation E1 and E2

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

OVERALL BUILDING ELEVATION

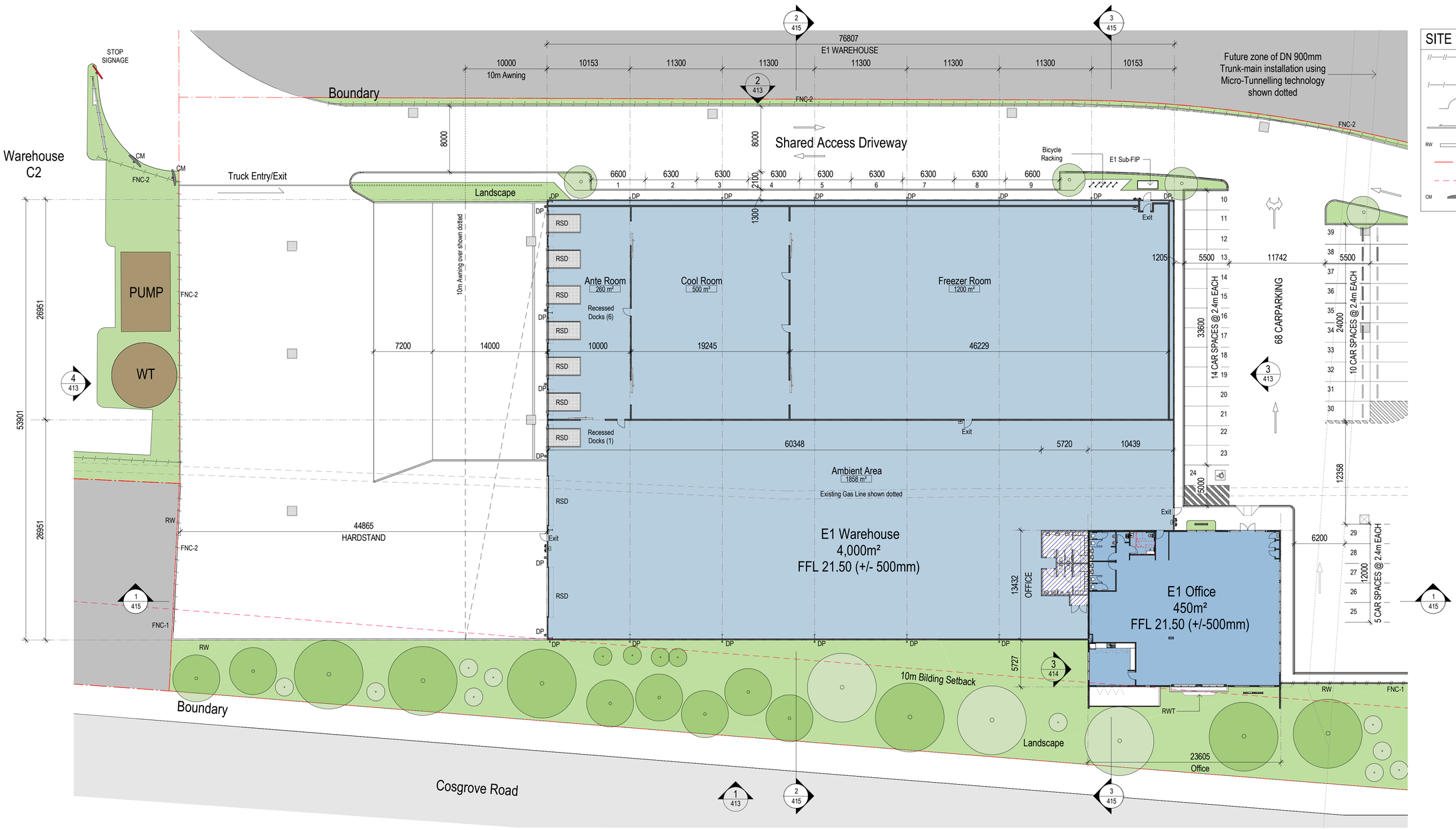
1:500 @A1
1:1000 @A3

0 50

08.01.20

EILC DA 402 (2)

NSW Ports in partnership with Goodman



SITE LEGEND:

- FNC-1, FENCE TYPE 2/ 1.8m DIPLOMAT BLACK P.C + SPEARTOP
- FNC-2, FENCE TYPE-1/1.8m CHAINMESH BLACK P.C WITH 3 ROWS OF BARDED WIRE
- PEDESTRIAN GATE
- SLIDING GATE
- RW — Retaining Wall
- Site Boundary
- 10m Building Setback
- CM — Convex Mirror

Fiout Schedule

- Fitout by tenant
- Base building Modification

1 E1 SITE & FLOOR PLAN

PRELIMINARY

SBA ARCHITECTS | ENFIELD ILC

ENFIELD ILC
MAINLINE RD , STRATHFIELD SOUTH

E1 SITE & FLOOR PLAN

1:250 @A1
1:500 @A3
07.01.20

EILC DA 410 (1)

NSWPorts in partnership with Goodman

Boundary

2/413 2/415

Boundary

EG

MDR MDR

10m Awning

BG

TRS TRS TRS TRS TRS TRS TRS

2.5° FALL

RIDGE LEVEL
RL.35.200

2.0° FALL

2.5° FALL

TRS TRS TRS TRS TRS TRS TRS TRS

INDICATIVE SOLAR SYSTEM LAYOUT

1.0°

BG

BG MDR

3/413

1/415

MDR

SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP

EG

BG

2.5° FALL

1/415

Boundary

10m Building Setback

10000

Boundary

ROOF LEGEND	
MDR	METAL ROOF SHEET
TRS	TRANSLUCENT ROOF SHEET
BG	BOX GUTTER
EG	EAVES GUTTER
SP	50 KW SOLAR SYSTEM

1 E1 ROOF PLAN

1/413 2/415

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E1 ROOF PLAN

0 20

1:200 @A1
1:400 @A3

07.01.20

EILC DA 411 (1)

NSW Ports in partnership with Goodman

Office Area Schedule	
Office E1	
Total Area	450 sqm
Fitout by tenant	
Base building Modification	

1 E1 OFFICE FLOOR PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

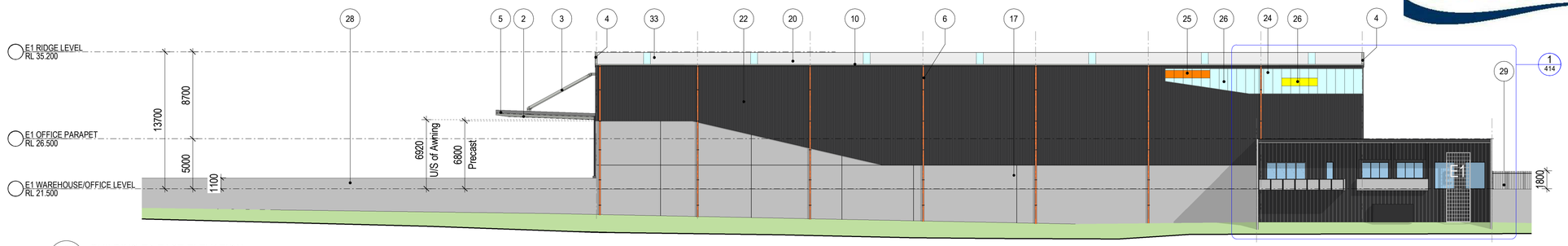
MAINLINE RD , STRATHFIELD SOUTH

E1 OFFICE FLOOR PLAN

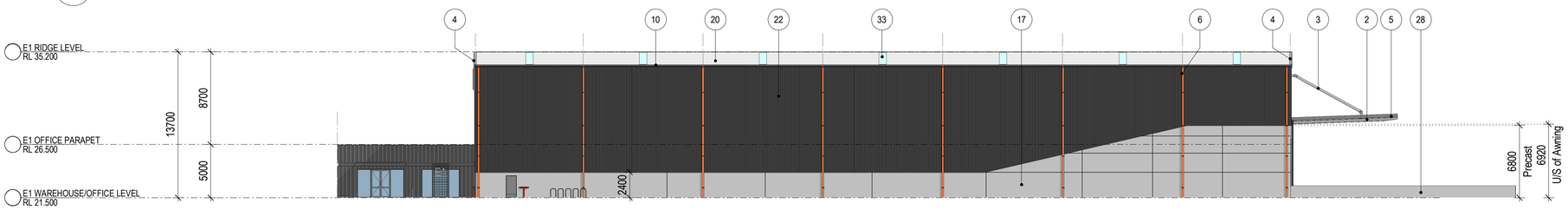
1:100 @A1
1:200 @A3

07.01.20

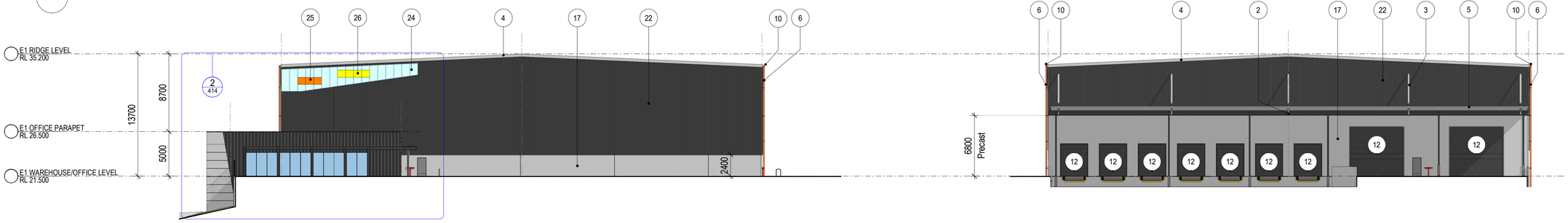
EILC DA 412 (1)



1 BUILDING E1-EAST ELEVATION



2 BUILDING E1-WEST ELEVATION



3 BUILDING E1-NORTH ELEVATION

4 BUILDING E1-SOUTH ELEVATION

FINISHES SCHEDULE E1- SCHEME A

	Material	Finish /Profile	Colour Scheme A-Dark
1	Aluminium Framed Glazing System	Powdercoat	Black Satin
2	Awning Steel Structure	Paint Finish	Dulux Shale Grey
3	Awning Struct	Paint Finish	Dulux Shale Grey
4	Prefinished Metal Capping/Flashing - Type 1	Colorbond	Shale Grey
5	Prefinished Metal Capping/Flashing - Type 2	Colorbond	Monument
6	Prefinish Metal Downpipes	Paint Finish	Orange
7	Garden feature wall	Garden wall double sided, steel frame & Grid	Black Satin
8	External Paver - Type 1	Outdoor Paving	Lightly Exposed Aggregate Concrete Walkways
9	Glazing	Performance Double Glazing Section J	Blue Tinted Glass
10	Prefinish Metal Gutter	Colorbond	Shale Grey
11	Off Form Concrete Planter Box	Natural Finish	
12	Metal Roller Shutter Doors	Paint Finish	Monument
13	Office Roof Soffit Lining	Paint Finish	Pure White
14	Precast Concrete with Expressed Joints	Natural Finish	
15	Office Profiled Metal Wall Cladding	Fielders Prominence Finesse 265mm Wide Pan	Monument
16	PFC Surround to Roller Shutter Doors	Paint Finish	Colorbond Monument

	Material	Finish/Profile	Colour Scheme A-Dark
17	Precast Concrete Panels - Type 1	Natural Finish	Natural
18	Precast Concrete Panels - Type 2	Impregnated Colour Precast	Monument
19	Profiled Glazing Reveals	Folded Meta Reveals	Black Satin
20	Profiled Metal Roof Sheeting - Type 1	Prefinish Metal Roof Sheeting	Colorbond Surfmist
21	Profiled Metal Roof Sheeting - Type 2 (Office Entry Awnings)	Prefinish Metal Roof Sheeting	Colorbond Monument
22	Profiled Metal Wall Cladding (Warehouse)	Prefinish Metal Wall Sheeting	Colorbond Monument
23	Spandrel	Colour back glass	Ceramic Frit-Colour: Frosted White Dots
24	Translucent Wall Cladding	Danpalon	Clear
25	Translucent Film	Avery Dennison	Sunset Orange
26	Translucent Film	Avery Dennison	Citrus Yellow
27	Warehouse Steel Structure	Paint Finish	Dulux Zeus Silver Grey
28	Retaining Wall		Refer to Civil's details
29	Outdoor Balustrade - Type perforated steel	Powdercoat	Dulux Black Satin
30	External Stairs	Off form concrete, w/alum. nosing	Natural Finish
31	Office Exposed Steel Structure	Paint Finish	Dulux Black Satin
32	Steel - RWT / Louvres	Powdercoated	Monument
33	Translucent Roof Sheeting	To Match Roof Sheeting Profile	Opal

PRELIMINARY

SBA ARCHITECTS | ENFIELD ILC

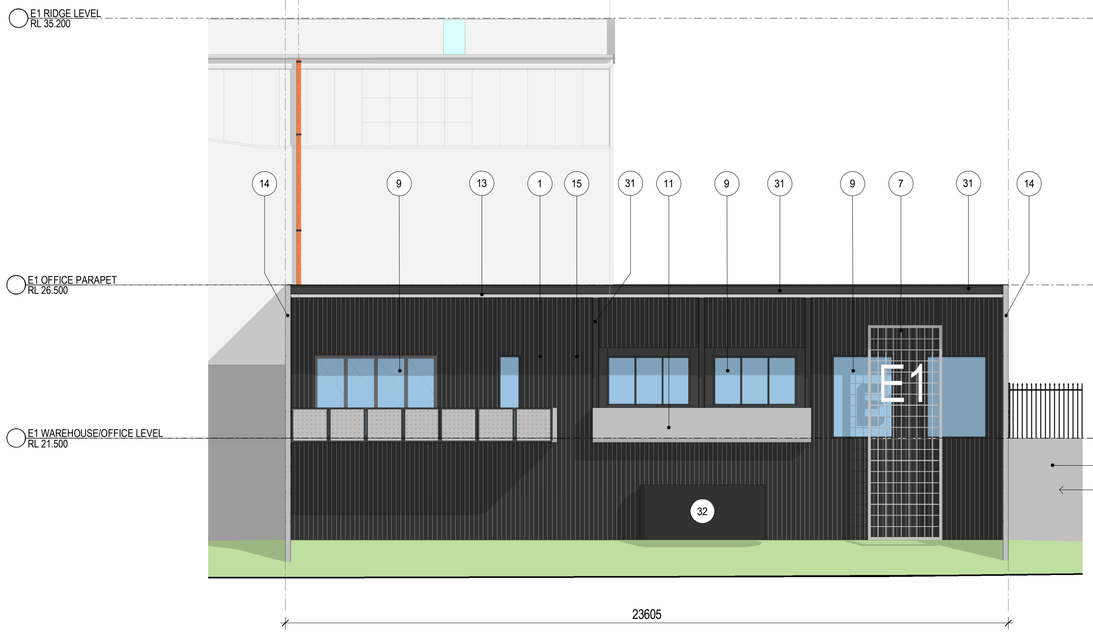
ENFIELD ILC
MAINLINE RD , STRATHFIELD SOUTH

E1 BUILDING ELEVATIONS

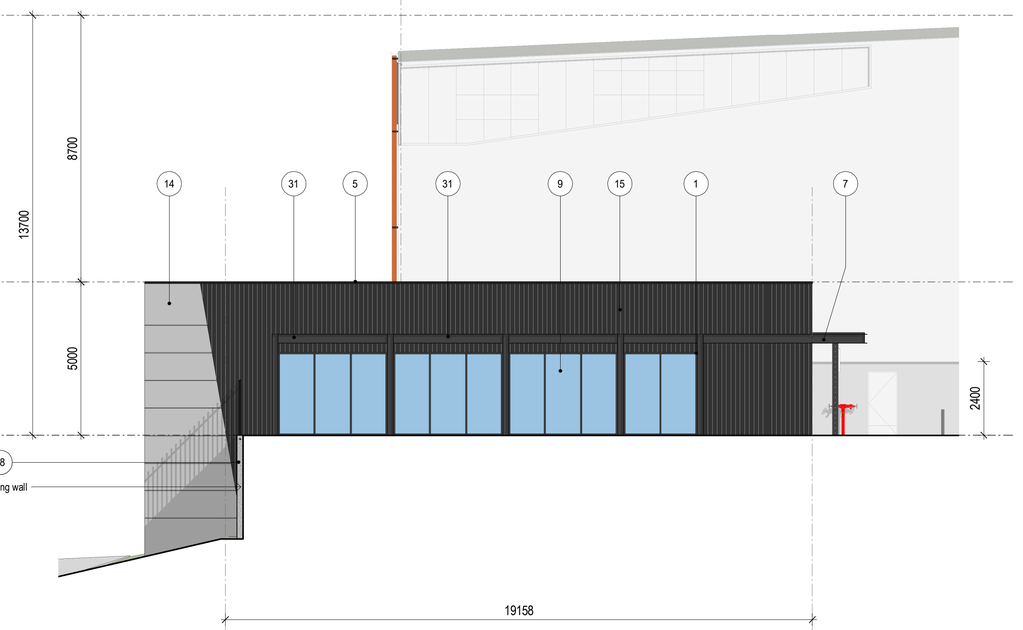
1:250 @A1
1:500 @A3
07.01.20

EILC DA 413 (1)

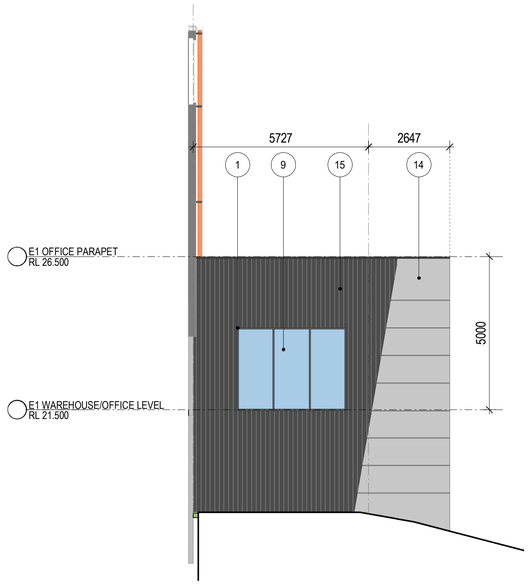
NSWPorts in partnership with Goodman



1 OFFICE E1- EAST ELEVATION



2 OFFICE E1- NORTH ELEVATION



3 OFFICE E1-SOUTH ELEVATION

4 OFFICE E1 PERSPECTIVE

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

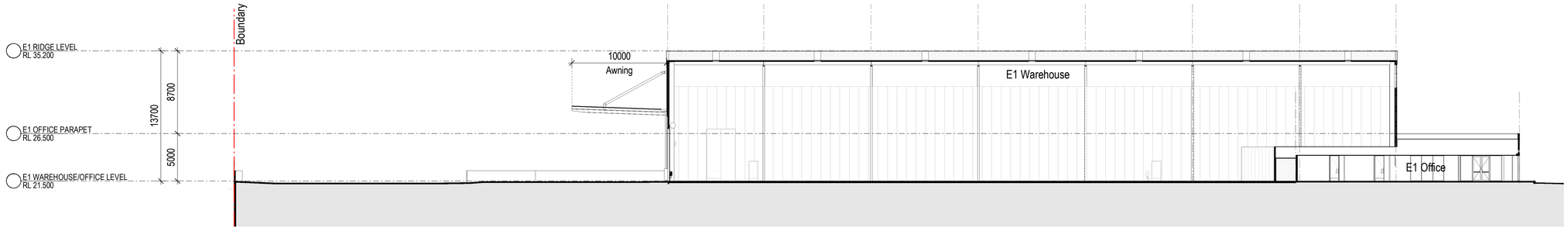
E1 OFFICE ELEVATIONS

0 10

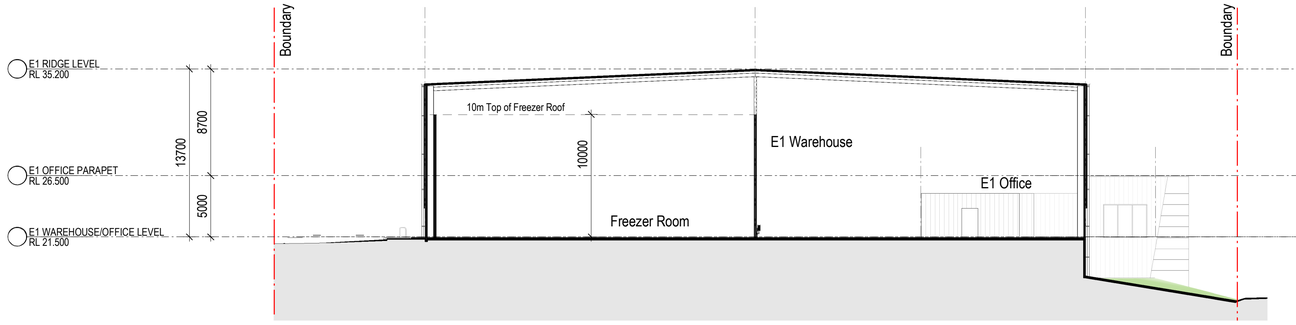
1:100 @A1
1:200 @A3

07.01.20

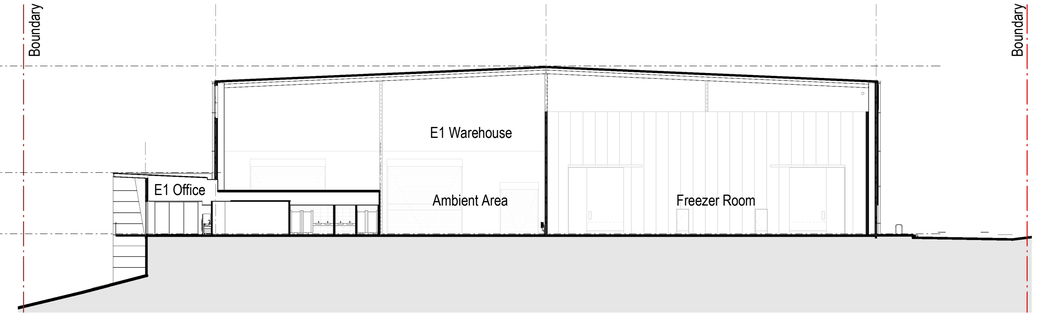
EILC DA 414 (1)



1 E1 WAREHOUSE & OFFICE - SECTION



2 E1 WAREHOUSE - SECTION



3 E1 OFFICE - SECTION

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E1 OVERALL SECTIONS

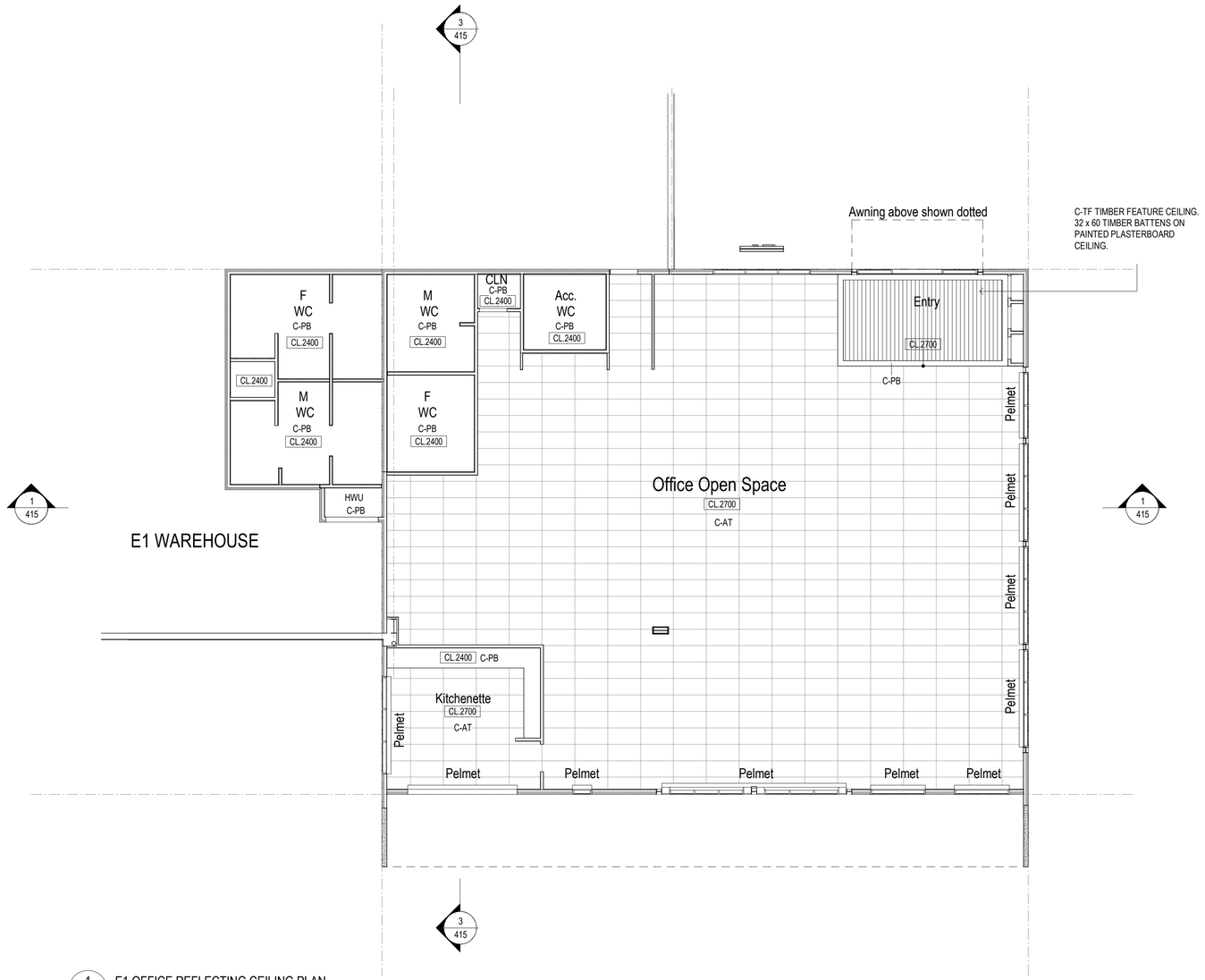
1:250 @A1
1:500 @A3

0 25

07.01.20

EILC DA 415 (1)

NSW Ports in partnership with Goodman



1 E1 OFFICE REFLECTING CEILING PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E1 OFFICE REFLECTED CEILING PLAN

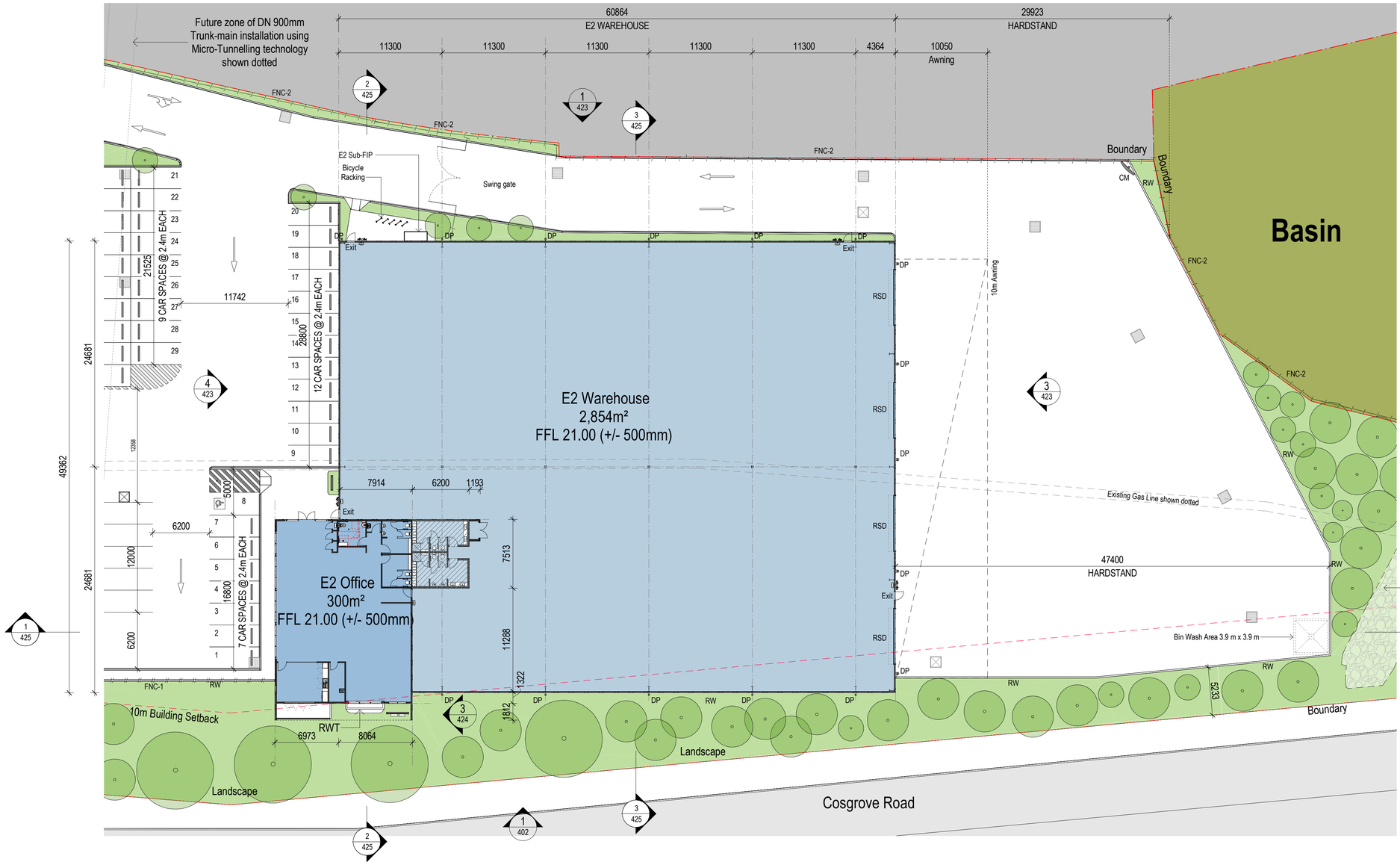
1:100 @ A1
1:200 @ A3

0 10

07.01.20

EILC DA 416 (1)

NSW Ports in partnership with Goodman



SITE LEGEND:

- FNC-1, FENCE TYPE 2/ 1.8m DIPLOMAT BLACK P.C + SPEARTOP
- FNC-2, FENCE TYPE-1/1.8m CHAINMESH BLACK P.C WITH 3 ROWS OF BARDED WIRE
- PEDESTRIAN GATE
- SLIDING GATE
- RW — Retaining Wall
- Site Boundary
- 10m Building Setback
- CM — Convex Mirror

Fiout Schedule

Fitout by tenant	
Base building Modification	

1 E2 SITE & FLOOR PLAN.

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E2 SITE & FLOOR PLAN

1:250 @A1
1:500 @A3

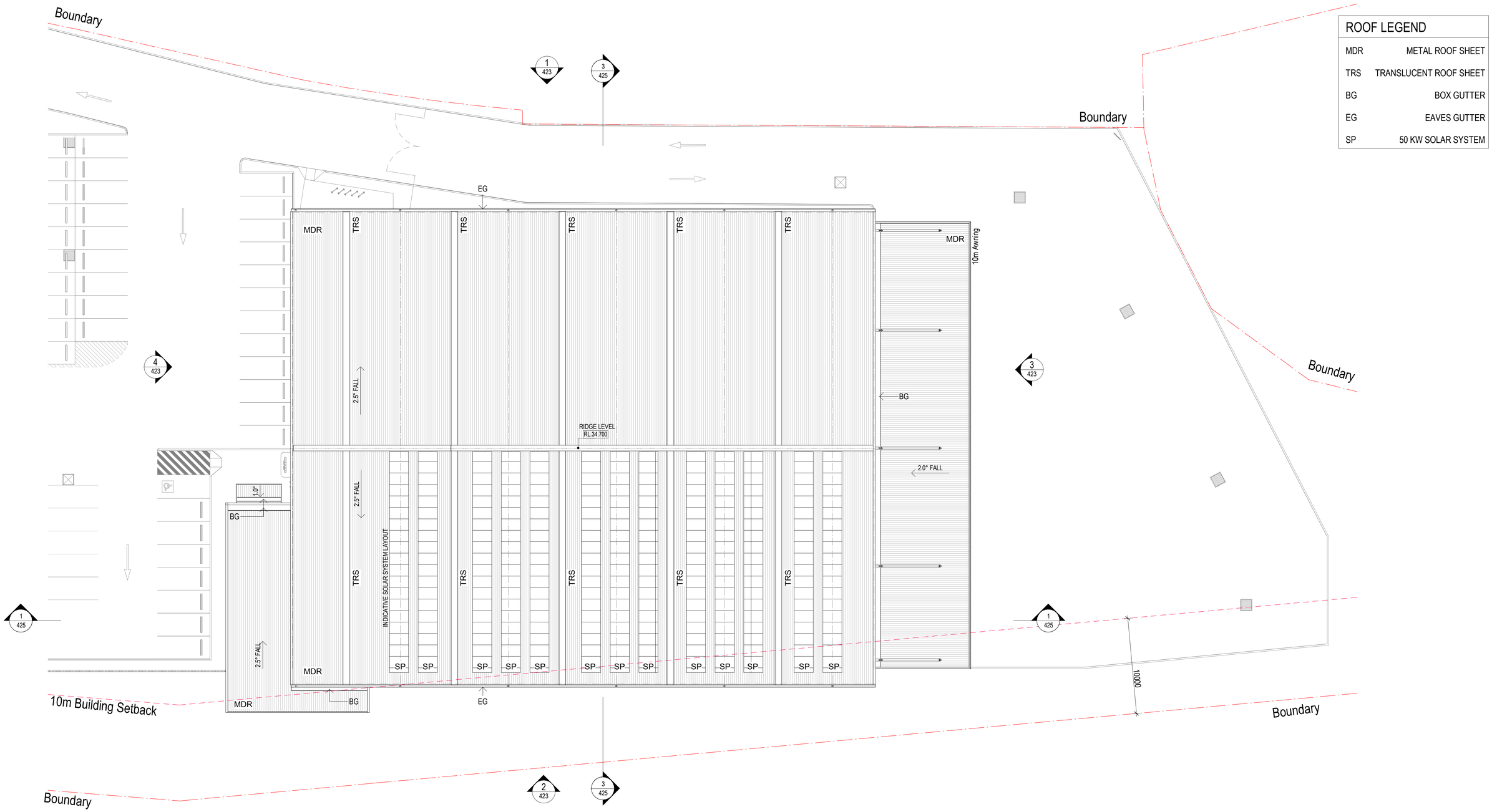
0 25

07.01.20

EILC DA 420 (1)

NSWPorts in partnership with Goodman

ROOF LEGEND	
MDR	METAL ROOF SHEET
TRS	TRANSLUCENT ROOF SHEET
BG	BOX GUTTER
EG	EAVES GUTTER
SP	50 KW SOLAR SYSTEM



1 E2 ROOF PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E2 ROOF PLAN

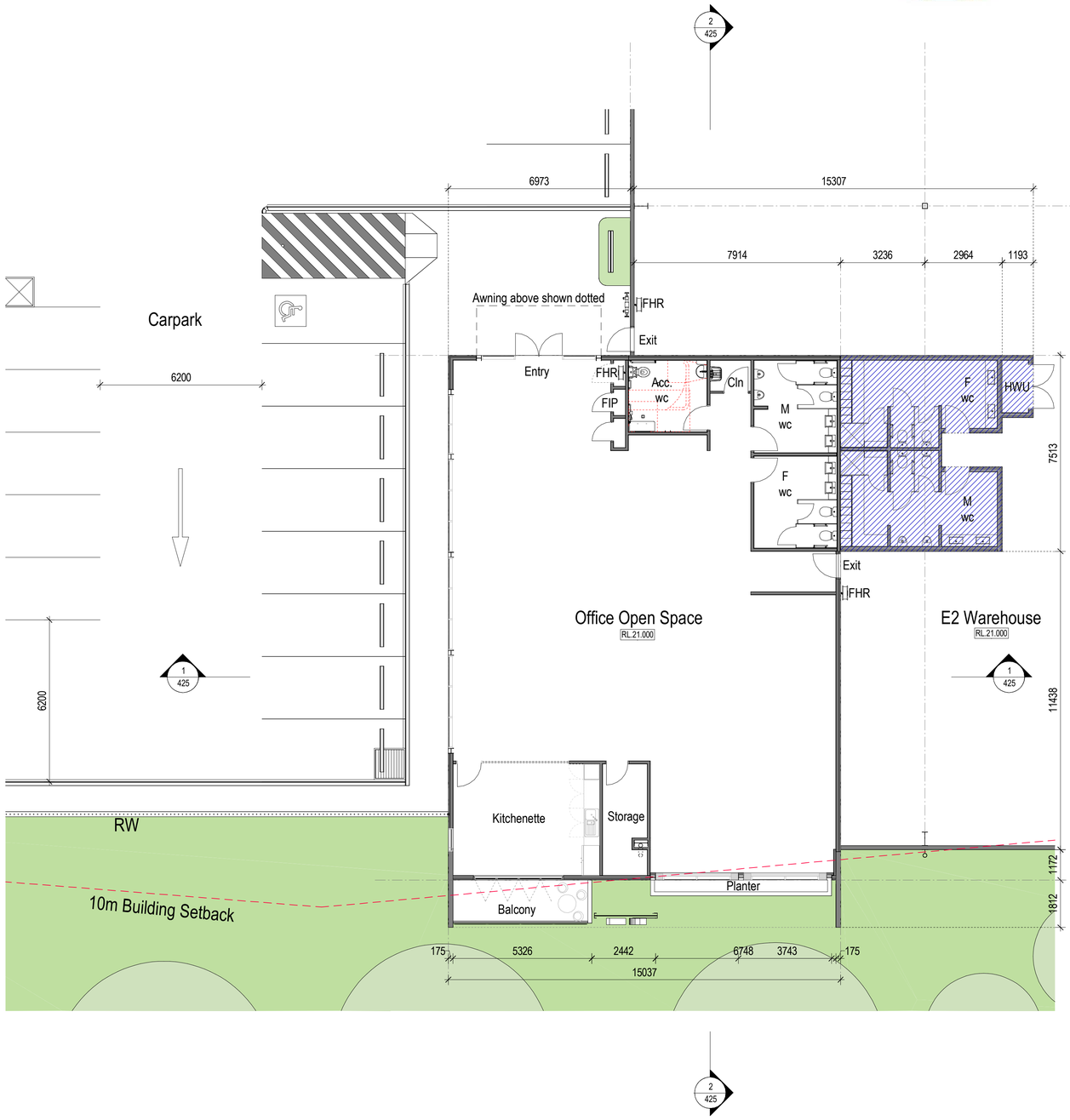
0 20

1:200 @A1
1:400 @A3

07.01.20

EILC DA 421 (1)

NSWPorts in partnership with Goodman



Office Area Schedule	
Office E2	
Total Area	300 sqm

1 E2 OFFICE FLOOR PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

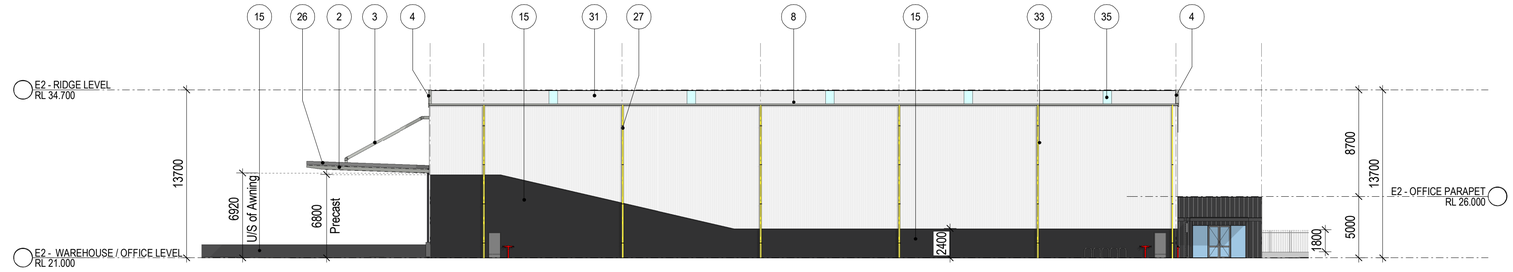
E2 OFFICE FLOOR PLAN

0 10

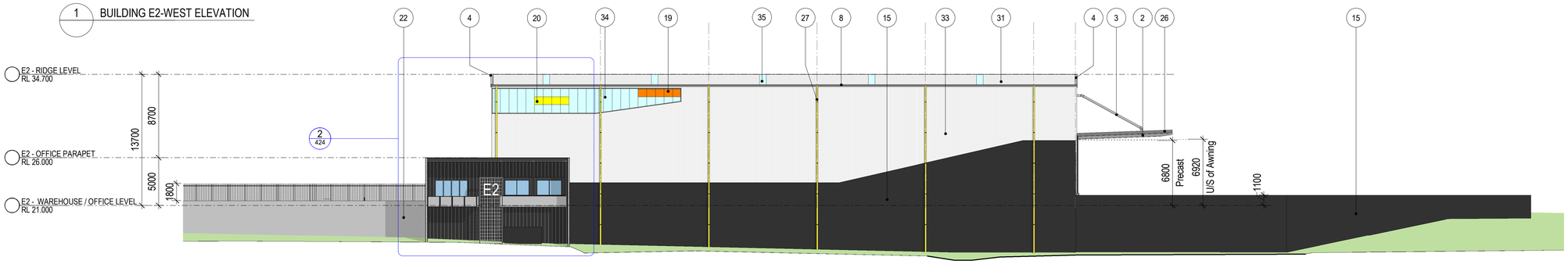
1:100 @A1
1:200 @A3

08.01.20

EILC DA 422 (2)

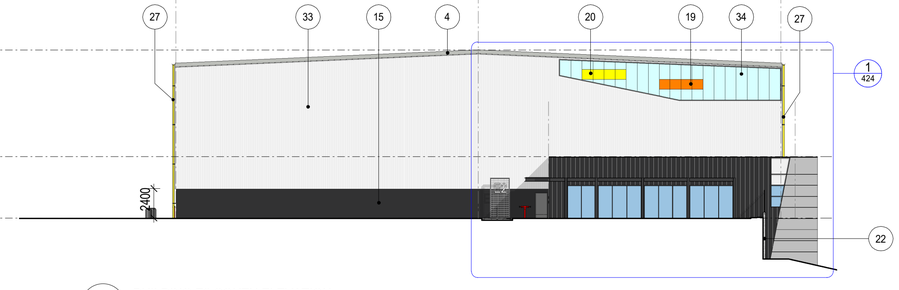


1 BUILDING E2-WEST ELEVATION



2 BUILDING E2-EAST ELEVATION

3 BUILDING E2-NORTH ELEVATION



4 BUILDING E2-SOUTH ELEVATION

FINISHES SCHEDULE E2- SCHEME B

	Material	Finish /Profile	Colour Scheme A-Dark
1	Aluminium Framed Glazing System	Powdercoat	Black Satin
2	Awning Steel Structure	Paint Finish	Dulux Shale Grey
3	Awning Struct	Paint Finish	Dulux Shale Grey
4	Prefinished Metal Capping/Flashing - Type 1	Colorbond	Shale Grey
5	Garden feature wall	Garden wall double sided, steel frame & Grid	Black Satin
6	External Paver - Type 1	Outdoor Paving	Lightly Exposed Aggregate Concrete Walkways
7	Glazing	Performance Double Glazing Section J	Blue Tinted Glass
8	Prefinish Metal Gutter	Colorbond	Shale Grey
9	Off Form Concrete Planter Box	Natural Finish	
10	Office Roof Soffit Lining	Paint Finish	Pure White
11	Precast Concrete with Expressed Joints	Natural Finish	
12	Office Profiled Metal Wall Cladding	Fielders Prominence Finesse 265mm Wide Pan	Colorbond Monument
13	Metal Roller Shutter Doors	Paint Finish	Dulux Monument (Not in use)
14	Precast Concrete Panels - Type 1	Precast	Natural Finish
15	Precast Concrete Panels - Type 2	Impregnated Colour Precast	Monument
16	Profiled Glazing Reveals	Folded Meta Reveals	Black Satin
17	Profiled Metal Wall Cladding	Prefinish Metal Wall Sheeting	Colorbond Monument (Not in use)

	Material	Finish/Profile	Colour Scheme A-Dark
18	Spandrel	Colour back glass	Ceramic Frit-Colour: Frosted White Dots
19	Translucent Film	Avery Dennison	Sunset Orange
20	Translucent Film	Avery Dennison	Citrus Yellow
21	Warehouse Steel Structure	Paint Finish	Dulux Zeus Silver Grey
22	Retaining Wall		Refer to Civil's details
23	Outdoor Balustrade - Type perforated steel	Powdercoat	Dulux Black Satin
24	External Stairs	Off form concrete, w/alum. nosing	Natural Finish
25	Office Exposed Steel Structure	Paint Finish	Dulux Black Satin
26	Prefinished Metal Capping/Flashing - Type 2	Colorbond	Basalt
27	Prefinish Metal Downpipes	Paint Finish	Yellow
28	Metal Roller Shutter Doors	Paint Finish	Dulux Basalt Grey
29	PFC Surround to Roller Shutter Doors	Paint Finish	Dulux Basalt Grey
30	Precast Concrete Panels	Impregnated Colour Precast	Dulux Surfmist
31	Profiled Metal Roof Sheeting	Prefinish Metal Roof Sheeting	Colorbond Surfmist
32	Profiled Metal Roof Sheeting - Type 2 (Office Entry Awnings)	Prefinish Metal Roof Sheeting	Colorbond Basalt
33	Profiled Metal Wall Cladding (Warehouse)	Prefinish Metal Wall Sheeting	Colorbond Surfmist

	Material	Finish/Profile	Colour Scheme A-Dark
34	Translucent Wall Cladding	Danpalon	Clear
35	Translucent Roof Sheeting	To Match Roof Sheeting Profile	Opal
36	Steel - RWT / Louvres	Powdercoated	Monument

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

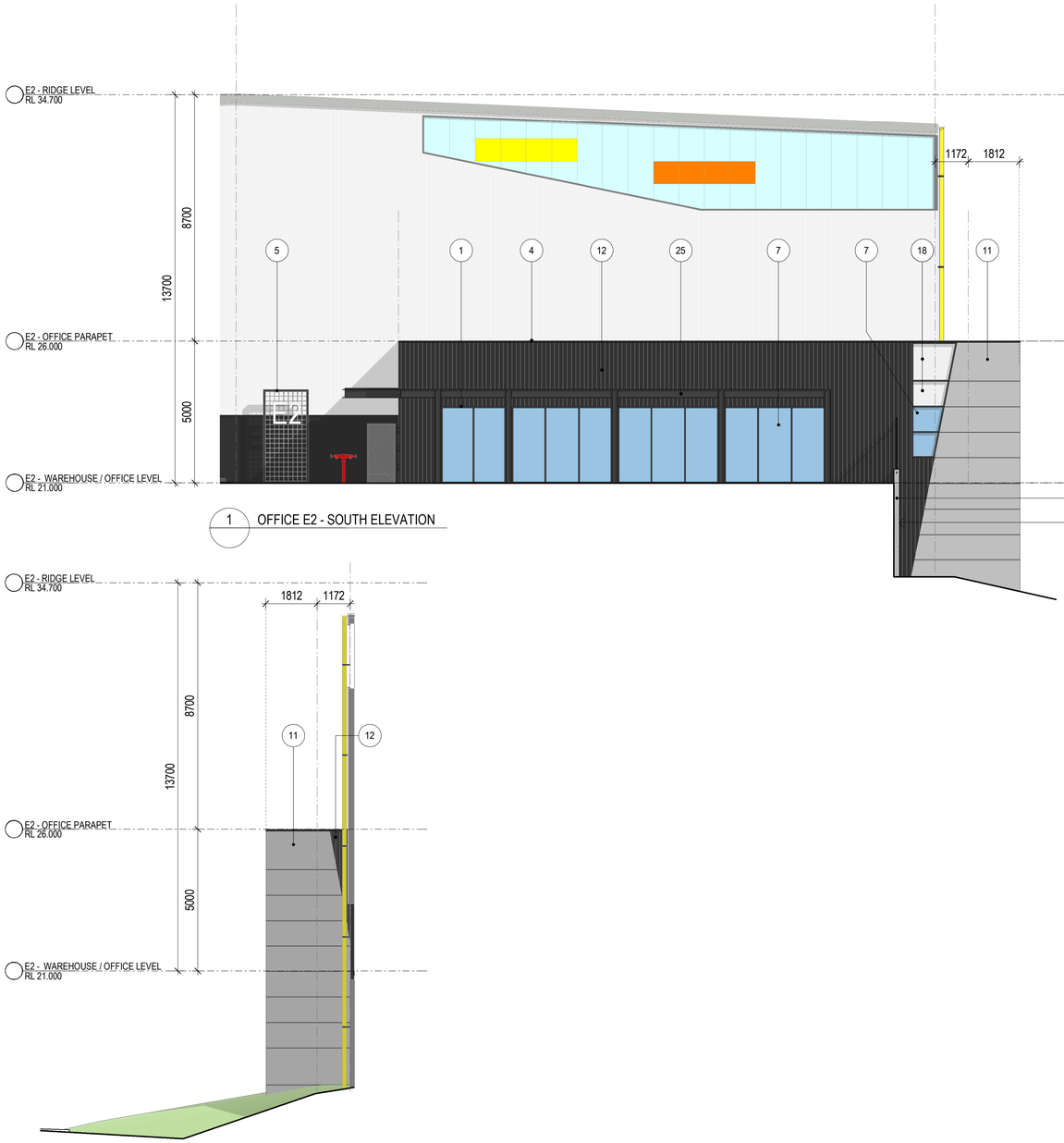
E2 BUILDING ELEVATIONS

1:250 @A1
1:500 @A3

08.01.20

EILC DA 423 (2)

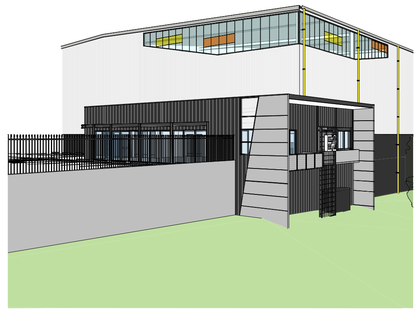
NSW Ports in partnership with Goodman



1 OFFICE E2 - SOUTH ELEVATION

2 OFFICE E2 - EAST ELEVATION

3 OFFICE E2 - NORTH ELEVATION



4 E2 OFFICE PERSPECTIVE

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

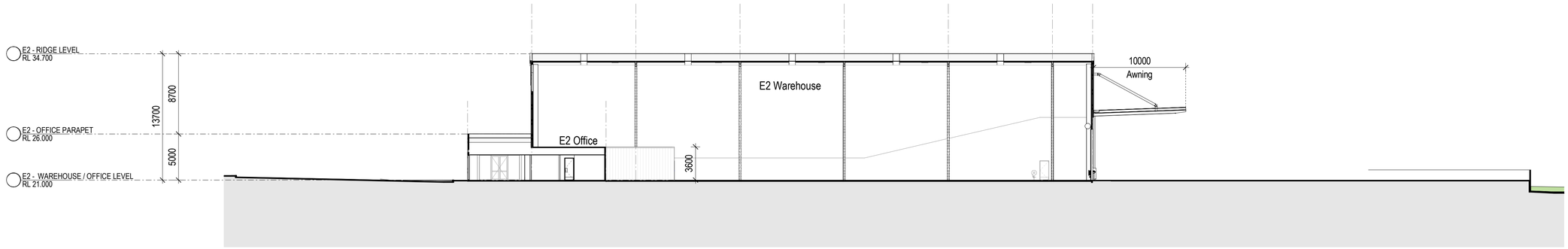
E2 OFFICE ELEVATIONS

1:100 @A1
1:200 @A3

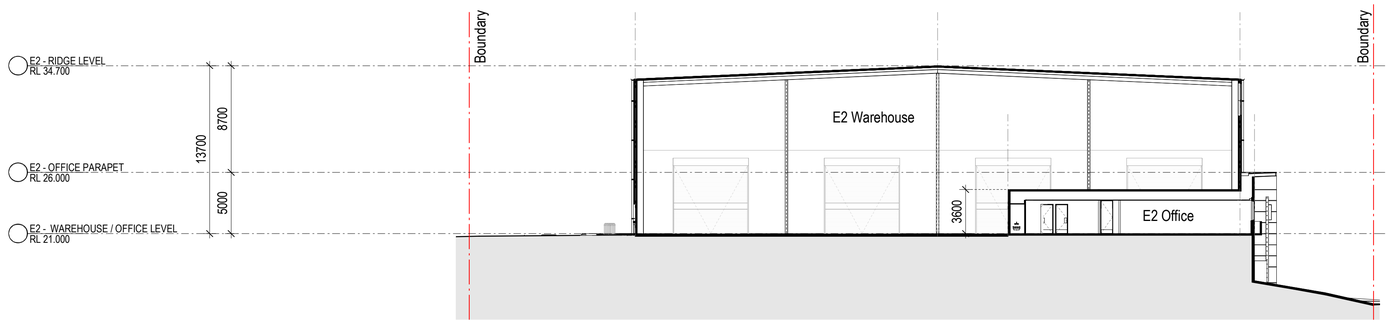
08.01.20

EILC DA 424 (2)

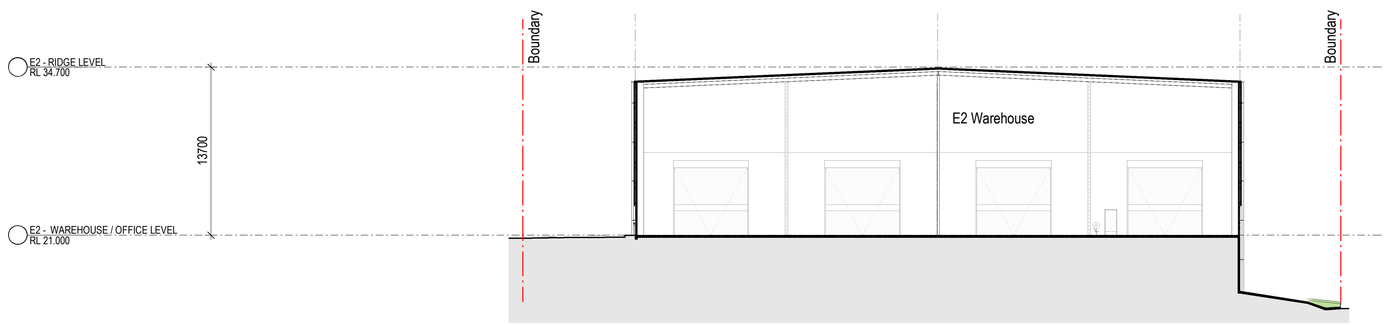
NSW Ports in partnership with Goodman



1 E2 WAREHOUSE & OFFICE - SECTION



2 E2 OFFICE - SECTION



3 E2 WAREHOUSE - SECTION

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

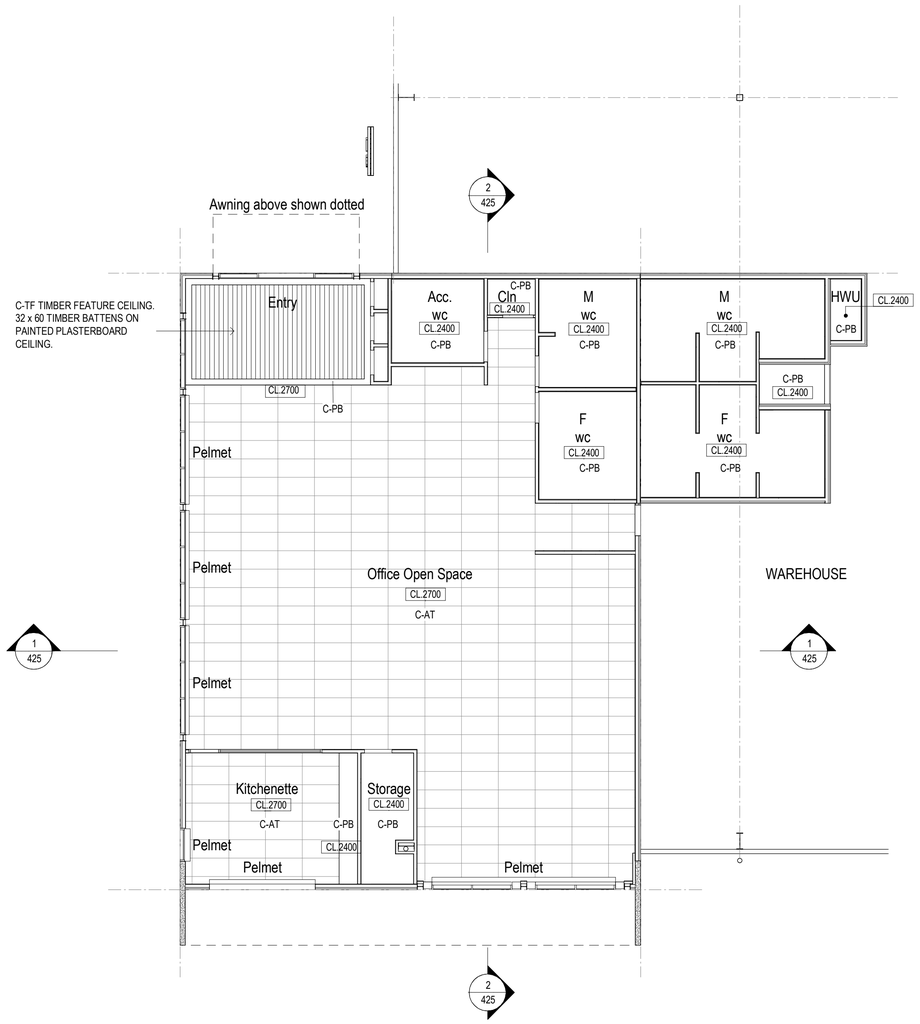
E2 OVERALL SECTIONS

1:250@A1
1:500@A3

0 25

07.01.20

EILC DA 425 (1)



1 E2 OFFICE REFLECTED CEILING PLAN

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

ENFIELD ILC

MAINLINE RD , STRATHFIELD SOUTH

E2 OFFICE REFLECTED CEILING PLAN

0 10

1:100 @ A1
1:200 @ A3

08.01.20

EILC DA 426 (2)

Appendix B – Civil Plans

NSW Ports in partnership with Goodman

NOTES:

LOTS 12 & 6 TO BE CONSOLIDATED

LOTS 2,7,3,4 & 20 TO BE CONSOLIDATED
(SUBJECT TO THE ACQUISITION OF LOT 7)

LOTS 8 & 9 TO BE CONSOLIDATED

PRELIMINARY

SBA ARCHITECTS

ENFIELD ILC

Enfield Intermodal Logistics Centre

Mainline Rd, Strathfield South

Sub-Division Plan

0 300

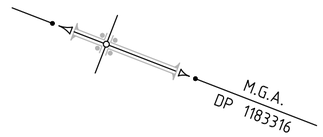
1 : 2500 @A1
1 : 5000 @A3

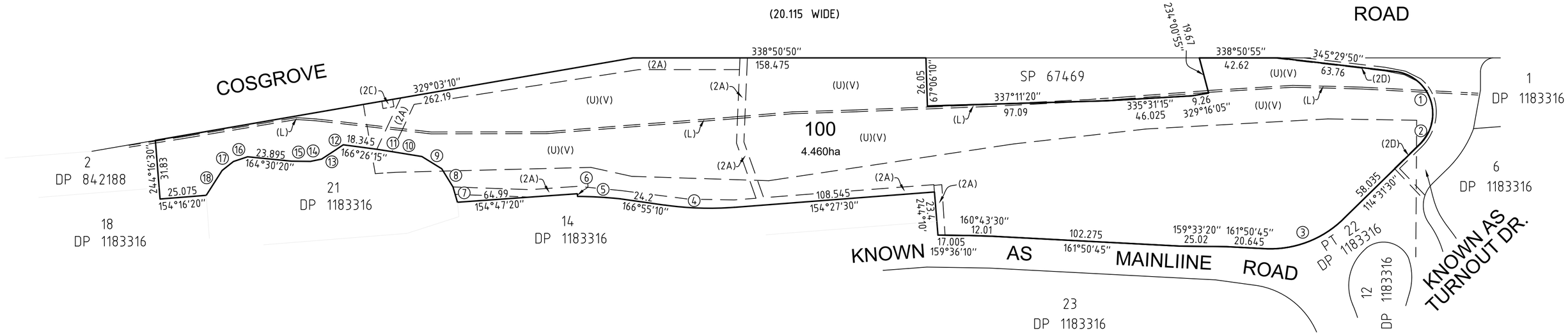
22 Jan 2018

EILC DA02 (P2)

SCHEDULE OF SHORT & CURVED BOUNDARIES

No.	BEARING	DISTANCE	ARC	RADIUS
1	39°54'30"	37.41	43.69	23
2	104°25'20"	8.07	8.11	23
3	138°11'05"	45.35	46.66	56.55
4	160°41'20"	37.765	37.84	173.985
5	162°06'10"	23.135	23.145	241.635
6	242°32'20"	1.455		
7	232°28'35"	8.63		
8	217°03'40"	11.565		
9	190°27'40"	12.61		
10	168°10'40"	16.345		
11	167°44'25"	8.33		
12	124°43'50"	5.29		
13	125°42'45"	8.74		
14	147°25'55"	6.205		
15	159°34'10"	10.16		
16	140°19'40"	8.105		
17	120°26'45"	7.79		
18	101°26'05"	15.93		





(2A) EASEMENT TO DRAIN WATER 2, 4 WIDE & VARIABLE WIDTH (DP 1183316)
(2C) EASEMENT FOR ELECTRICITY AND OTHER PURPOSE VARIABLE WIDTH (DP 1183316)
(2D) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 2 WIDE & VARIABLE WIDTH (DP 1183316)
(L) EASEMENT FOR PIPELINE 1 WIDE & VARIABLE WIDTH (X371733)
(U) RESTRICTION ON THE USE OF LAND (7918905)
(V) RESTRICTION ON THE USE OF LAND (7918905)

SURVEYOR Name: SCOTT PETER LINDSAY LORD Date of Survey: 18 - 9 - 2018 Surveyor's Reference: 44814 006DP	PLAN OF CONSOLIDATION OF LOTS 2, 3, 4, 7 AND 20 IN DP 1183316	LGA: STRATHFIELD Locality : STRATHFIELD SOUTH Reduction Ratio 1: 1500 Lengths are in metres.	Registered	DP

CUT/FILL DIAGRAM

SCALE 1 : 10

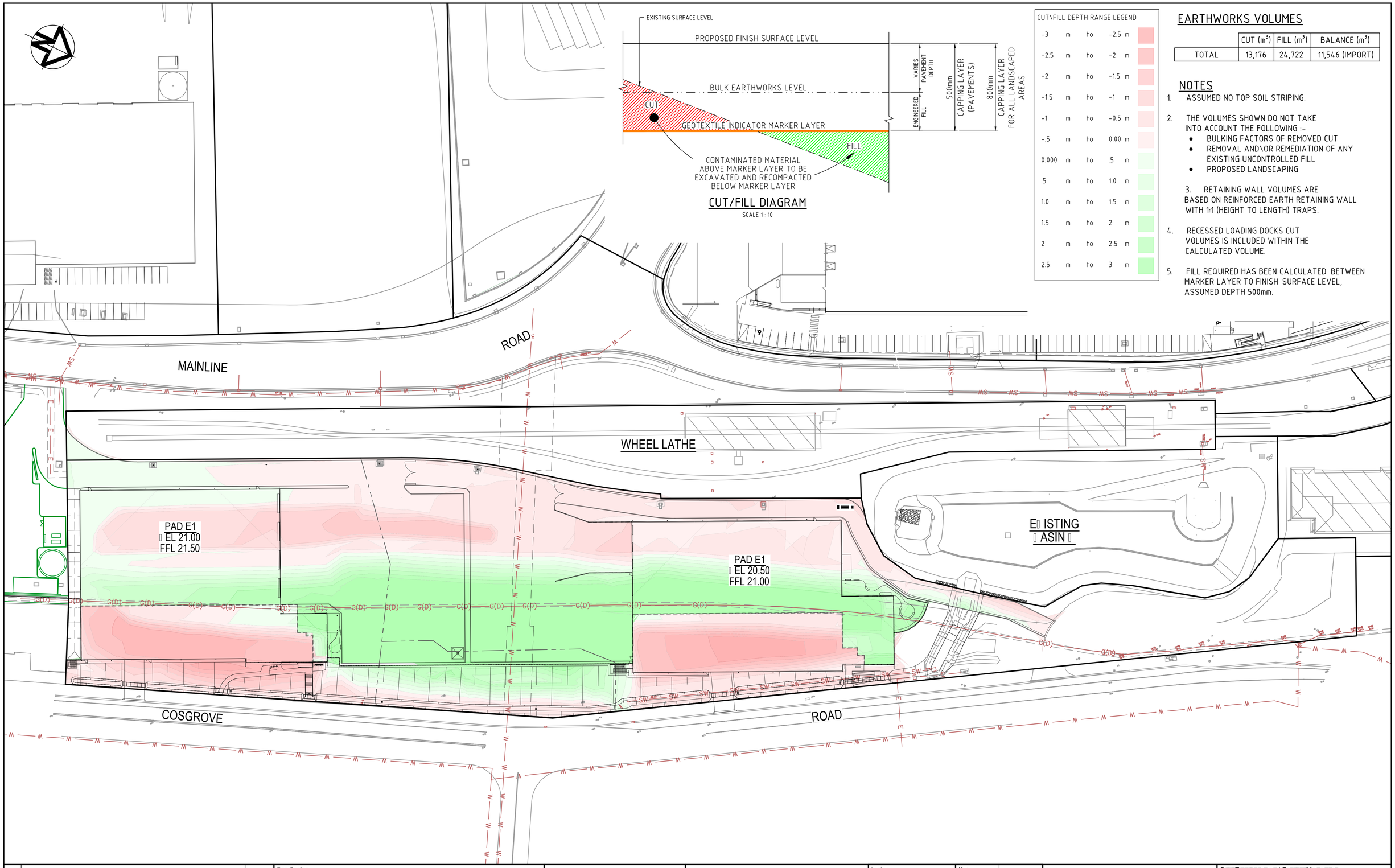
CUT\FILL DEPTH RANGE LEGEND				
-3	m	to	-2.5	m
-2.5	m	to	-2	m
-2	m	to	-1.5	m
-1.5	m	to	-1	m
-1	m	to	-0.5	m
-.5	m	to	0.00	m
0.000	m	to	.5	m
.5	m	to	1.0	m
1.0	m	to	1.5	m
1.5	m	to	2	m
2	m	to	2.5	m
2.5	m	to	3	m

EARTHWORKS VOLUMES

	CUT (m^3)	FILL (m^3)	BALANCE (m^3)
TOTAL	13,176	24,722	11,546 (IMPORT)

NOTES

1. ASSUMED NO TOP SOIL STRIPING.
2. THE VOLUMES SHOWN DO NOT TAKE INTO ACCOUNT THE FOLLOWING :-
   - BULKING FACTORS OF REMOVED CUT
   - REMOVAL AND\OR REMEDIATION OF ANY EXISTING UNCONTROLLED FILL
   - PROPOSED LANDSCAPING
3. RETAINING WALL VOLUMES ARE BASED ON REINFORCED EARTH RETAINING WALL WITH 1:1 (HEIGHT TO LENGTH) TRAPS.
4. RECESSED LOADING DOCKS CUT VOLUMES IS INCLUDED WITHIN THE CALCULATED VOLUME.
5. FILL REQUIRED HAS BEEN CALCULATED BETWEEN MARKER LAYER TO FINISH SURFACE LEVEL, ASSUMED DEPTH 500mm.



Issue	Description	Date
P1	ISSUED FOR INFORMATION	24-06-19

Bar Scales

100mm on Original

THIS DRAWING CANNOT BE COPIED OR REPRODUCED IN ANY FORM OR USED FOR ANY OTHER PURPOSE OTHER THAN THAT ORIGINALLY INTENDED WITHOUT THE WRITTEN PERMISSION OF AT&L

Client: Goodman

Scales	NTS	Drawn	AD
		Designed	F□
Grid	MGA	Checked	AT
Height Datum	AHD	Approved	

Project: INTERMODAL LOGISTICS CENTRE ENFIELD PRECINCT E

Title: BULK EARTHWORKS CUT AND FILL PLAN

C□□□E□□□□□r□a□d Pr□□□□Ma□a□□r□
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Status: FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION

A1

Project No. - Drawing No.: 17-478-SKC031

Issue: P1

Date Plotted: 24 Jun 2019 - 03:58PM File Name: F:\17-478 Enfield\Drgs\Civil\Sketches\17-478-SKC031_Precinct E-Cut And Fill Plan.dwg

Appendix C – Photographs

Photo 1. 06052019 – Looking north across Precinct E, parallel with western boundary, with stockpile on right side of photograph.

Photo 2. 06052019 – Looking north across Precinct E, parallel with eastern boundary, with stockpile on right side of photograph.

Photo 3. 06052019 – Looking south across Precinct E, parallel with western boundary, with stockpile on left side of photograph.

Photo 4. 06052019 – Looking north across Precinct E, parallel with western boundary, at gravel covered car park with stockpile on right side of photograph.

Photo 5. 06052019 – Looking north across Precinct E, parallel with western boundary, with dense vegetation on right hand side.

Photo 6. 06052019 – Looking north through dense vegetation running north to south through centre of site.

Photo 7. 06052019 – Looking north-west through centre of site at dense vegetation.

Photo 8. 06052019 – Looking north at eastern boundary of Precinct E with dense vegetation in centre of site, with Cosgrove Road in background.

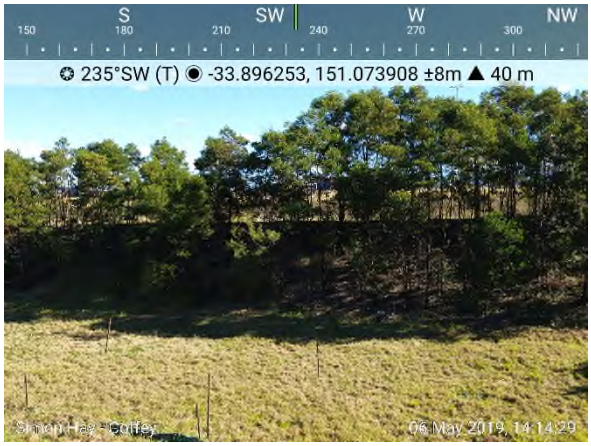

Photo 9. 06052019 – Looking south-west high-pressure gas main corridor running north south through centre of site.

Photo 10. 06052019 – Looking north-east at storage containers (part of Precinct C redevelopment) located in central western portion of site.

Photo 11. 06052019 – Close-up of dangerous goods storage in central western portion of site – no staining was identified in soil surrounding storage.

Photo 12. 06052019 – Looking north across Precinct E, parallel with western boundary with maintenance shed (off-site) on left side of photograph.

Photo 13. 06052019- Close-up of suspected asbestos-containing fibre cement debris identified on ground surface in north-western portion of site (see Figure 2).

Photo 14. 06052019- Looking south across Precinct E from northern portion of site at stockpile in background and mature and dense vegetation on left side of photograph.

Appendix D – Data Quality Objectives for Validation

DATA QUALITY OBJECTIVES

Step 1 – State the Problem

Goodman and NSW Ports are proposing to construct industrial warehouses on Precinct E. Asbestos contaminated soil is present in fill and in stockpiles which may pose a potential unacceptable risk to human health without remediation or adequate management measures in place. The asbestos contaminated soil is proposed to be capped with a geotextile and clean imported fill as part of the proposed development.

Step 2 - Identify the Decisions

The decisions to be made based for validation will be as follows:

- Has the asbestos contaminated soil been sufficiently capped, such that potential unacceptable risks to human health are appropriately managed following redevelopment?
- Has imported material been validated as suitable for the proposed land use?
- Has surplus materials, if any, removed from site been disposed to a landfill lawfully licenced to receive such material?

Step 3 - Identify Inputs in the Decision

The inputs required to make the above decisions will be as follows:

- Information from previous reports outlining the nature and extent of contaminated soils requiring management.
- Description and type of the marker layer used.
- Visual observations.
- Photographs.
- VENM/ENM certificates.
- Laboratory analytical results.
- Topographical survey data and site plans for the marker layer and capping layers.
- Waste disposal dockets and truck registers.

Step 4 - Define Boundaries of the Study

The spatial boundary of the management and validation works is the lot boundaries of Precinct E, as shown on Figures 1 and 2 attached.

Step 5 - Develop a Decision Rule

Soil and mulch will be imported to the site for landscaping and capping purposes. Imported soil including excavated natural material (ENM), virgin excavated natural material (VENM) must have appropriate certification in accordance with the NSW EPA ENM/VENM exemption and order. Aggregates must be sampled in accordance with Table 3 of the CSDMP and be required to be sourced from a commercial supplier. Mulch will be required to be obtained from a commercial supplier and have a specification. If a VENM/ENM certificate cannot be provided or the integrity of the certificate is questionable, then a visual inspection and sampling of the proposed material will be required to be undertaken at the source. Sampling, analysis and validation criteria requirements are outlined in Section 9.3. VENM assessment at the source would also be subject reviewing the site history to assess whether any activities (historic or current) undertaken at that site may potentially have caused contamination of the source material.

In the event that the VENM, ENM, aggregates or mulch does not meet the validation criteria following assessment onsite it will be required to be removed from the site.

In the event that contaminated soil cannot be effectively capped, then the contaminated soil will be required to be disposed offsite.

If asbestos-containing material is visually observed during a visual clearance inspection then it will be required to be removed from that area or capped, and the visual clearance inspection repeated.

If disposal dockets are not provided by the earthworks contractor, then the landfill will be contacted directly for assistance.

If topographic survey data cannot be provided, then an intrusive investigation may be required to be carried out to confirm the depth of capping and a visual inspection carried out to confirm the presence of the marker layer.

If the quality control (QC) results meet the data quality indicators (DQI), then the analytical data is considered suitable and reliable for the purpose of this contamination investigation.

Step 6 - Specify the performance or acceptance criteria

There are two types of decision errors:

- Sampling errors, which occur when the samples collected are not representative of the conditions within the investigation area; and
- Measurement errors, which occur during sample collection, handling, preparation, analysis and data reduction.

The null hypothesis, which is an assumption assumed to be true in the absence of contrary evidence, for this validation assessment will be 'Asbestos contaminated soil has not been effectively capped and therefore the site is not suitable for use'.

These errors may lead to the following decision errors:

- Type I error - Rejecting the hypothesis as false when it is really true: Deciding that effective capping has occurred when the reverse is true; and
- Type II error - Accepting the hypothesis as true when it is really false: Deciding that effective capping has not occurred when the reverse is true.

An assessment will be made as to the likelihood of a decision error being made based on the results of a QA/QC assessment and the closeness of the data to assessment criteria. Additionally, statistical methods such as 95% Upper Confidence Limit (UCL) calculations may be utilised, where applicable.

The acceptable limits on decision errors applied during this investigation and the manner of addressing possible decision errors were developed based on the data quality indicators (DQIs) of:

- Accuracy: a quantitative measure of the closeness of reported data to the true value;
- Comparability: a qualitative parameter expressing the confidence with which one (1) data set can be compared with another;
- Completeness: a measure of the amount of useable data (expressed as %) from a data collection activity;
- Representativeness: the confidence (expressed qualitatively) that data are representative of each media present on the site; and
- Precision: a quantitative measure of the variability (or reproducibility) of data.

Step 7 - Optimise the Design

The purpose of this step is to identify a resource-effective data collection design for generating data that satisfies the DQOs.

To ensure the design satisfied the DQOs, DQIs (for accuracy, comparability, completeness, precision and reproducibility) have been established to set acceptance limits on field methodologies and laboratory data collected.

DATA QUALITY INDICATORS

A summary of the field and laboratory DQIs for the validation assessment are provided in the table below.

Summary of DQIs

Field Considerations	Laboratory Considerations	Comments
Accuracy (bias)		
Are SOPs appropriate and complied with? Has sampling equipment been calibrated?	Analysis of:	Bias introduced:
	Trip blanks;	By chemicals during handling or transport;
	Rinsate blanks;	From contaminated equipment;
	Reagent blanks;	From contaminated reagent;
	Method blanks;	During laboratory analysis;
	Matrix spikes;	During laboratory preparation and analysis (may be high or low);
	Surrogate spikes;	During laboratory preparation and analysis (may be high or low);
	Reference material;	Precision of preparation of analytical method;
	Laboratory control samples;	Precision of preparation of analytical method;
Comparability		
Number of sampling rounds Same methodologies and SOPs used on each occasion. Experienced sampler and same sampler. Climatic conditions (temperature, rainfall, wind). Same types of samples collected (filtered, size fractions).	Sample analytical methods used (including clean-up). Laboratory practical quantification limits (PQL) or limit of reporting (LOR) (justify /quantify if different). Same laboratories (justify /quantify if different). Same units (justify /quantify if different).	Same approach to sampling (WIs, holding times). Quantify influence from climatic or physical conditions. Samples collected, preserved, handled in same manner (filtered, same containers).

Field Considerations	Laboratory Considerations	Comments
Completeness		
Critical locations sampled. Critical depths sampled. SOPs appropriate and complied with. Experienced sampler. Documentation correct including COCs.	Critical samples analysed in accordance with the RAP. Analytes sampled in accordance with scope of works. Appropriate methods and PQL/LORs. Sample documentation correct. Sample holding times complied with.	The required percentage completeness should be specified in the scope of works. Required data must be obtained from critical samples and CoPC. Incompleteness is influenced by: Field performance problems (access problems, difficulties on site, damage); Laboratory performance problems (Matrix interference, invalid holding times); and Matrix problems.
Representativeness		
Appropriate media sampled according to the field program. Media in the field program sampled. Samples properly and adequately preserved Samples in proper custody between the field and reaching the laboratory	Samples analysed according to the RAP.	Samples must be collected to reflect characteristics of each medium. Sample analysis must reflect properties of field samples. Homogeneity of the samples. Appropriate collection, handling, storage and preservation. Detection of laboratory artefacts, e.g. contamination blanks.
Precision		
Field program appropriate and complied with.	Analysis of:	
	Laboratory and inter-laboratory duplicates; and	Measured by the coefficient of variance or standard deviation of the mean or Relative Percentage.
	Field duplicates.	Field duplicates measure field and laboratory precision Difference (RPD) calculations. Variation in RPDs can be expected to be higher for organics, low concentrations (<5 x laboratory PQL/LOR) or non-homogenous samples.

Acceptable limits adopted for data quality indicators for this assessment are outlined in the table below.

Acceptable Limits

Item	Acceptable Limit
Analysis of blind (intra-laboratory) duplicates and split (inter-laboratory) duplicates.	Rate of 1:20 (10%) primary soil samples for the same analysis of primary samples; Calculation of relative percentage differences between primary and duplicate samples. RPD results for soil samples: • 200% (where the average concentration is 0-10 x laboratory PQL/LOR); • 50% (where the average concentration is 10-20 x laboratory PQL/LOR); and • 30% (where the average concentration is > 20 x laboratory PQL/LOR). RPDs will be considered where a concentration is greater than 10 times the PQL/LOR.
Analysis of rinsate blanks	Rate of one (1) sample per batch of soil sampling; and Results less than the laboratory PQL/LOR.
Analysis of laboratory prepared trip blanks	Rate of one (1) sample per batch for soil samples where volatiles are analysed; and Results less than the laboratory PQL/LOR.
Analysis of laboratory prepared trip spikes	Rate of one (1) sample per batch for soil samples where volatiles are analysed; and Results within 60-120% recovery.
Analysis of laboratory blanks, surrogates, reference and control samples	The laboratories will be required to conduct their own internal quality program for assessment of the repeatability of the analytical procedures and instrument accuracy under their NATA accreditation. This will include analysis of laboratory blank samples, duplicate samples, spike samples, control samples and surrogate spikes. The laboratory QA/QC procedures and results will be described within the laboratory reports. The laboratory internal QA/QC sample results will be reviewed for comparison with the laboratory's NATA guidelines and Schedule B3 of ASC NEPM 2013.
Laboratories and methods used	National Association of Testing Authorities accredited for the method. Methods should be in accordance with amended ASC NEPM.
Holding times	Samples should be analysed within recommended holding times.
Sample PQL/LORs	Results less than the adopted assessment criteria; justify/quantify if different.

Appendix E – Induction Records

Name	Company	Date	Signature	Inducted by

Name	Company	Date	Signature	Inducted by

Name	Company	Date	Signature	Inducted by

Appendix F – Personal Protective Equipment

Asbestos Materials Personal Protective Equipment (PPE)

During asbestos-related earthworks, PPE must be worn by the licenced asbestos removal contractor, the licensed asbestos assessor and other personnel who are required to enter the asbestos work area. The following PPE should be used as required:

Types of Asbestos Materials PPE	
PPE	**Picture**
Half faced disposable P2 respirator <u>can only</u> be used for non-friable/bonded asbestos-related works. Respirators must comply with AS/NZS1715–2009 *Selection, use and maintenance of respiratory equipment.*	
Half faced respirator with a P3 particulate filter cartridge to be used for friable asbestos-related works. Respirators must comply with AS/NZS1715–2009 *Selection, use and maintenance of respiratory equipment.*	
Full faced respirator with a P3 particulate filter cartridge to be used for friable asbestos-related works. Respirators must comply with AS/NZS1715–2009 *Selection, use and maintenance of respiratory equipment.*	
Disposable coveralls rated Type 5 or equivalent e.g. Tyvek	
Appropriate glasses or goggles.	
Appropriate gloves i.e. cut resistant gloves for working with soil and disposable nitrile gloves to be worn over the cut resistant gloves, where required. Occupational protective gloves shall comply with EN 420:1994(AS/NZS 2161.2:1998)–*Occupational Protective Gloves, Part 2 General Requirements.*	

It is important to note that the disposable coveralls and gloves are single use only and must be disposed of as Special Waste (Asbestos Waste) after each use. Respirators needs to be decontaminated. Cartridges must be inspected and replaced as required dependent upon the type and duration of usage.

Appendix G – Unexpected Finds Procedure, Form and Register

If an unexpected find is identified during earthworks, the following procedure shall to be followed:

1. Cease disturbance of the affected portion of the site.
2. Immediately implement controls if it is considered that the unexpected find may pose an immediate risk of harm to human health or the environment, and it is safe to do so.
3. Notify the relevant authorities if required (i.e. NSW EPA, SafeWork NSW).
4. Contact the Site Supervisor, Principal Contractor and the Contractors Environmental Representative (CER) for inspection.
5. Site Supervisor, Principal Contractor and CER to conduct an assessment of the location and extent of the unexpected find, if safe to do so.
6. Work Health and Safety (WHS) and environmental controls shall be established based on initial observations, if required. These may include but not be limited to:
    a. Controlling access by establishment of barricades and warning signs.
    b. Encapsulating with clean soil, plastic or geofabric.
    c. Establishing erosion and sediment controls
    d. Employing dust mitigation measures.
    e. Air monitoring.
7. Further visual assessment and sample collection and analysis shall be carried out by a qualified environmental consultant or occupational hygienist, if required. If necessary, samples shall be collected and analysed at a laboratory for contaminants of potential concern using National Association of Testing Authorities (NATA) accredited methods.
8. Depending on the outcome of the assessment by the environmental consultant / occupational hygienist, the unexpected find may need to be further assessed, managed, remediated or disposed offsite in accordance with regulatory requirements.
9. A meeting/workshop shall be held by the Principal Contractor. The CER, environmental consultant / occupational hygienist and key stakeholders shall attend the meeting to determine an appropriate course of action. This should include discussions around the handling, treatment and disposal of material; Workplace Health and Safety considerations; and how the affected area shall be validated.
10. Affected areas shall be reopened for earthworks following a clearance of the location and issuance of a report by the environmental consultant / occupational hygienist and/or instruction from the Principal Contractor or CER.

Any unexpected finds encountered should be listed on a UFP register, which should include the action taken and the status of the unexpected find. A suitable register is attached.

Prior to closing out an unexpected find it will be important to ensure the appropriate documentation is obtained, such as: photographs, the UFP form, waste classification letter(s) and a validation report or letter.

UNEXPECTED FINDS PROTOCOL FORM

To be completed by the Site Supervisor/Environmental Representative

Form Completed By	
Company Name	
Contact Details	
Date Form Completed	
Date Unexpected Find Identified	
UFP Reference Number	
Location of Unexpected Find including a site sketch	
Description of Unexpected Find	
Persons Contacted / Notified	
Unexpected finds isolated	Yes ☐ No ☐
Description of controls established	
Photographs taken	Yes ☐ No ☐
Further Assessment Required	Yes ☐ No ☐
Other Comments	

Unexpected Finds Register					
UFP Reference Number	Date UFP Identified	Suspect Material	Recorded on UFP Form	Action Taken	Status
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		

APPENDIX J

Spoil Re-use and Fill Importation Protocol

ENFIELD INTERMODAL LOGISTICS CENTRE

Precinct E
Spoil Re-Use and Fill Importation Protocol

Prepared for:

Goodman Limited
Level 17
60 Castlereagh Street
Sydney NSW 2000

SLR Ref: 630.12792-R01
Version No: -v1.0
October 2019

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 Limited (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.

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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
630.12792-R01-v1.0	16 October 2019	Samantha Hayes	Nathan Archer	Nathan Archer

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1 Cut and Fill

The redevelopment will include cut and fill of the existing material, placement of a geofabric marker layer and capping with imported Virgin Excavated Natural Material (VENM) or Excavated Natural Material (ENM) prior to the placement of slabs or landscaping. A combination of cut and imported material will be used to complete a depth of 1 m for landscaped areas (including 100 mm of topsoil/mulch) and 500 mm in paved areas which will include the following slab/pavement thicknesses:

- 160 mm to 200 mm for warehouses and hardstands;
- 180 mm for carparks and roads; and
- 110 mm for pedestrian pavements.

The intention is to achieve a cut and fill balance across the site, with the goal of no exportation of material offsite. This results from imported material being preferable to exporting potentially contaminated material offsite. Excavated clean materials will be used on site where possible. Clean material will be imported for fill as a secondary option. Any imported material will be placed and compacted as fill upon arrival onsite therefore no permanent stockpiles will remain onsite. Furthermore, the earthworks and pad levels will not impact the established bio-retention basins approved and construction under MP 05_0147.

A summary of the earthworks cut/fill volumes for each precinct are summarised in **Table 1**, showing that there is a net deficit of fill for the Development and importation of fill will be required.

Table 1 Earthwork Cut and Fill Volumes

Precinct	Cut (m^3)	Additional Cut (m^3)	Fill (m^3)	Balance (m^3)
Precinct A	17,100	19,630	82,200	31,770 (Import)
Precinct B	13,700		0	
Precinct C	1,950	4,525	16,300	7,325 (Import)
Precinct D	5,900		3,400	
Precinct E	8,128	–	31,254	23,126 (Import)
Precinct F	3,330	1,050	5,750	1,370 (Import)
Precinct H	7,200	6,900	16,100	2,000 (Import) + 7,800 (Engineered fill) (import)
Total	**57,308**	**32,105**	**155,004**	**73,391 (Import)**

The fill material will be used to create a level warehouse pad and to ensure the least amount of potentially contaminated materials is disturbed. The existing drainage structures will not be disturbed, connection into the existing drainage system will be through existing stubs provided and constructed under MP 05_0147.

It is expected that approximately 23,126 m^3 of clean material will be imported to Precinct E. All material will be maintained on the precinct, except for minor surplus material that may be exported from Precinct E to Precinct A. The exported material will be surplus material resulting from the completion of footings and underground services at Precinct E. The exported material is expected to be minimal, noting that the intent would be to maintain this material on Precinct E where possible.

There is the possibility that some of the spoil generated from grading works across the site could contain contaminants at low concentrations. Given the potential for some contamination, handling of this spoil should be done with due care in accordance with the requirements of the *Contaminated Soil Disturbance Management Plan* (CSDMP) (Coffey 2019). Potential for generation of dust will also be minimised.

2 Unexpected Contamination in Spoil

Unexpected contamination aspects that could be encountered during construction include (but are not limited to):

- Drainage pipes and sumps, potentially blocked with or containing contaminated sediment;
- Malodourous or stained soils; and
- Buried asbestos or other material at concentrations above the remediation criteria.

Unexpected finds will be managed in accordance with the CSDMP prepared by Coffey (2019).

If unexpected contamination sources are encountered during construction, the following general approach for managing unexpected contamination may be adopted:

- Immediately notify the Project Manager who will notify Goodman (Developer) / NSW Ports (Proponent) of the identified or suspected contamination;
- An appropriately qualified environmental professional will be engaged to carry out an assessment of the nature and extent of the unexpected contamination, which may include sampling, laboratory analysis and reporting;
- Liaise with a SafeWork NSW Class A Licenced Asbestos Removal Contractor (LARC) if asbestos is uncovered;
- Carry out any required remediation work in accordance with CSDMP;
- Carry out any required validation work to demonstrate that the identified contamination has been adequately remediated or managed; and
- Report the works conducted to a standard suitable for review by an accredited site auditor.

3 Fill Importation Protocol

Where additional fill is required, only ENM and/or VENM will be imported to site for use as fill. Qanstruct will check that any fill received on site is certified as ENM/VENM including maintaining records/receipts of any fill received.

3.1 Definitions

VENM is defined in the *Protection of the Environment Operations Act 1997* (POEO Act) as:

> *Natural material (such as clay, gravel, sand, soil or rock fines):*
>
> *a) that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities, and*
>
> *b) that does not contain any sulfidic ores or soils or any other waste.*

The use of VENM as capping material is excluded from the definitions of 'resource recovery' and 'waste disposal (application to land)' under Clauses 34 and 39 of Schedule 1 of the POEO Act, and therefore a number of requirements of the POEO Act and *Protection of the Environment Operations (Waste) Regulation 2014* (the Waste Regulation) do not apply.

The NSW Environment Protection Authority (EPA) has established a certification process for waste generators to follow in order to certify excavated material as VENM.

ENM is defined under the Waste Regulation as:

> *a)* Naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has: *been excavated from the ground, and*
>
> *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*.

ENM is the subject of a resource recovery exemption under Part 9 of the Waste Regulation (*The Excavated Natural Material Order 2014*). This makes ENM exempt from a number of requirements of the POEO Act and Waste Regulation, including:

- Requirements for an Environmental Protection Licence (EPL) under Section 48 of the POEO Act;
- Waste tracking requirements under Part 4 of the Waste Regulation;
- Requirements to pay the EPA for waste received at a site under Section 88 of the POEO Act; and
- Notification and reporting requirements under clauses 109 and 110 of the Waste Regulation.

The NSW EPA has established a certification process for waste generators to follow in order for ENM.

3.2 Requirements for Providers of Fill Material

The following sections outline the procedures and tests that are required to assess and certify VENM and ENM materials by providers. These requirements should be taken into consideration when accepting VENM and ENM materials to the development site for use as imported fill.

3.2.1 VENM Assessment Procedure

The assessment procedure listed in **Table 2** provides a summary of the requirements outlined by the EPA for providers of VENM. Further information can be found here: https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material.

Table 2 VENM Assessment Procedure for Providers

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: • 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; and • 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	• 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 Soils (ASS) or Potential Acid Sulfate Soils (PASS); and • If the ASS 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	• Review the applicable naturally occurring asbestos risk maps, available on SafeWork NSW website; and • 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 asbestos.
Is there any other waste present	VENM cannot contain any waste	• Inspection of source site; • Interviews with personnel at source site; and • Supplier to provide VENM certificate.

Item/Consideration	VENM	Course of Action
Is chemical assessment necessary	Yes, if material is potentially contaminated with manufactured chemicals or process	• 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 6** and Total Recoverable Hydrocarbons (TRH) C6-C40, Organochlorine Pesticides (OCP), Organophosphorus Pesticides (OPP), Polychlorinated Biphenyls (PCB) and Volatile Halogenated Compound (VHC) (or Chlorinated Hydrocarbons [CHC]).

3.2.2 VENM Testing

If VENM material is potentially contaminated with manufactured chemicals or process residues, it will be sampled and analysed according to the following requirements:

- A minimum of 3 samples per source site will be required;
- Source site volumes are less than 1000 m^3 with a rate of 1 sample per 100 $m,^3$ 1 sample per 250 m^3 and/ or 1 sample per 500 m^3 depending on the source and volume; and
- Source site volumes greater than 1000 m^3 with a sampling rate of 1 per 1000 m^3. Lower rates may be applicable where site history/background data indicates a low contamination.

Where chemical testing is undertaken to assess if the material is potentially contaminated with manufactured chemicals or process residues:

- Analysis results for organics 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; and
- Analysis results for metals should indicate background concentrations (as per *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013* (ASC NEPM) guidelines in outlined in **Section 3.2.3**).

If asbestos is identified, materials will not be accepted for use at the Site and a SafeWork NSW Class A LARC will be contacted.

3.2.3 VENM Validation Criteria

Laboratory results for material imported as VENM will meet the definition of VENM as per the POEO requirements and also meet the following validation criteria:

- Ambient background concentrations (ABC) of metals (where available) adopted from Schedule B5b of the amended ASC NEPM 2013:
  - Zinc: 3 mg/kg to 60 mg/kg;
  - Arsenic: 1 mg/kg to 18 mg/kg;
  - Copper: 2 mg/kg to 40 mg/kg;
  - Lead: 0.1 mg/kg to 30 mg/kg;
  - Nickel: 1 mg/kg to 55 mg/kg;
  - Trivalent chromium: 3 mg/kg to 160 mg/kg.
- TRH, BTEX, PAH, OCP, OPP and PCB results less than the limit of detection for the method.
- Asbestos results will be required to be reported as ‘no asbestos detected’.

3.2.4 ENM Assessment Criteria

ENM material must be consistent with the definition of ENM provided in the Waste Regulation (refer to **Section 3.1**).

The Excavated Natural Material Order 2014 (EPA 2014) states that a provider of ENM must undertake sampling of the material as follows:

- Where the potential for ASS is identified through a pH test (returning a result of pH 5 or below) or where a review of appropriate ASS risk mapping identifies the potential presence of ASS; or
- Where ENM material is to be stockpiled.

As stated above, where ENM is stockpiled, it must be sampled in accordance with **Table 3** below and the following:

- Composite sampling must be undertaken for analysis of Attributes 1 to 10 and 18 in **Table 6** below. 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 tonnes, the number of samples in **Table 3** (below) must be repeated; and
- In-situ material must be sampled by collecting discrete samples in accordance with **Table 4** and **5**. For source sites larger than 50,000 m^2, these should be subdivided into smaller areas and sampled as per **Table 3.**

Table 3 Stockpiled Soil Sampling Requirements

Quantity (tonnes)	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 - 1,000	4	
1,000 - 2,000	5	
2,000 - 3,000	7	
3,000 - 4,000	10	

Table 4 In-Situ Soil Sampling Requirements at Surface

Size of In-Situ area (m^2)	Number Sampling Points	Validation	Size of In-Situ area (m^2)	Number Sampling Points	Validation
500	5	Required (test results comply with the conditions of the ENM exemption prior to the material being supplied to Site)	10,000	21	Required (test results comply with the conditions of the ENM exemption prior to the material being supplied to Site)
1,000	6		15,000	25	
2,000	7		20,000	30	
3,000	9		25,000	35	
4,000	11		30,000	40	
5,000	13		35,000	45	
6,000	15		40,000	50	
7,000	17		45,000	52	
8,000	19		50,000	55	
9,000	20		-	-	

Table 5 In-Situ Soil Sampling Requirements 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.	Required if the depth of excavation is equal to or greater than 1 m below ground level.

3.2.5 ENM Validation Criteria

Material imported as ENM will be expected to have analytes less than the maximum average of concentration for characterisation, and absolute maximum concentration, listed in **Table 6** below of the ENM order. These values are provided in **Table 6** for reference. Asbestos results will be required to be reported as 'no asbestos detected'.

Table 6 ENM Chemicals and Concentrations Criteria

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	N/A	0.5
14. Toluene	N/A	65
15. Ethylbenzene	N/A	25
16. Xylene	N/A	15
17. Total petroleum hydrocarbons	250	500
18. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05%	0.1%
19. Asbestos	Not detected	Not detected

3.2.6 Aesthetics

In addition to the numerical criteria, consideration shall be given to the presence of soils that are odorous or discoloured as a result of contamination, contain visible Asbestos-Containing Material (ACM), excessive extraneous material, for qualitative aesthetic purposes.

3.2.7 Fill Material Assessment Reports

An Assessment 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 VENM and/or ENM sampling requirements;
- Identifiers for the source site (i.e. street address, suburb, Lot/DP numbers etc.);
- The location of the source site on a figure;
- The anticipated volume of material to be imported;
- A description of the material to be imported;
- Site inspection observations including neighbouring properties;

- Photographs of site conditions;
- Results and analysis of all applicable VENM and/or ENM sampling requirements;
- Copies of NATA stamped laboratory analysis certificates, including chain of custody documentation, sample receipt acknowledgement forms, QC data; and
- A conclusion (i.e. does the material meet the classification of either ENM or VENM).

3.2.8 Review of VENM / ENM Assessment Reports

Qanstruct are to be provided with a copy of each Assessment Report for review. The report must be sighted prior to the importation of material to the Site.

In the event that the review indicates insufficient assessment data, no materials will be imported to the Site until the Site Environmental Consultant has satisfactorily addressed the identified data gaps.

Qanstruct will 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.

3.2.9 Quality Assurance and Control

Project specific quality assurance/quality control (QA/QC) procedures will be implemented to improve transparency, consistency, comparability, completeness, and confidence in data collected.

The field procedures to be adopted during the validation assessment are discussed in the CSDMP. Laboratory QA/QC procedures and adopted Data Data Quality Indicators (DQIs) are discussed within **Appendix D** of the CSDMP.

3.3 Validation Report

In accordance with the CSDMP (Coffey 2019) following the completion of the earthworks and capping, a validation report shall be prepared in general accordance with *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (Office of Environment and Heritage (OEH) 2011) and the amended ASC NEPM 2013, documenting that the capping works have been completed. This report shall contain information including:

- Details of the site, environmental setting and contamination status;
- A summary of the asbestos capping works including:
  - Material tracking information (to be provided by the Earthworks Contractor);
  - Survey data confirming the location, extent or geofabric and capping material;
  - Photographs of the earthworks.
- A summary of site inspections completed;
- Details of the source, classification, and the suitability of all imported materials;
- Waste characterisation data and associated reports, haulage dockets and receipts from licensed disposal facilities (to be provided by the Earthworks Contractor);

- Evidence of adequate waste classification process and proof that the receiving facilities are licenced to accept the wastes (to be provided by the Remediation Contractor);
- Air monitoring and clearance certificates;
- Any variations to the strategy undertaken during the implementation of capping works;
- Details of environmental incident and / or unexpected finds of contamination occurring during the capping works and the actions undertaken in response to these incidents;
- Clear statement of the suitability of the site that is the subject of the validation report, for the proposed use; and
- Scope and requirements for the ongoing management of the capping layer, including an outline of the *Long - Term Environmental Management Plan* (LTEMP).

3.3.1 Record Keeping

In accordance with *The Excavated Natural Material Order 2014* (EPA 2014), written record of the following must be kept for six years:

- The sampling plan and schedule;
- All characterisation sampling results;
- The volume of detected hotspot material and the location (if any);
- The quantity supplied; and
- The name and address of each person to whom the supplier provided the VENM / ENM.

Additional information will be recorded, including:

- Vehicle registration (license plate) number;
- Location of source site;
- Contact name at source site;
- Time left source site and time of arrival at Site; and
- Contents of truck and are they similar to the expected contents.

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 will cease and will only recommence when Qanstruct are satisfied that the issue has been addressed. Where contaminated materials are found following use on site, the material will be isolated until appropriate testing can be undertaken and then removed by a licenced contractor.

4 References

Australian Government (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure*

Coffey Environments (2019) *Contaminated Soil Disturbance Management Plan*

EPA (2014) *The Excavated Natural Material Order 2014*

Office of Environment and Heritage (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*

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APPENDIX K

Emergency Management Plan

2.17
Emergency Response & Crisis Management

Overview

This procedure defines the response & management required to deal effectively with any foreseeable emergency so as to minimize the impact to personnel, property & the environment.

The procedure applies to events, which threaten life, property or the environment and which require immediate action.
This includes, but is not limited to:

- Emergency medical response
- Fire response
- Evacuation
- Adverse weather
- Plant overturn or collision
- Structure or trench collapse
- Environmental spill response
- Civil disturbance
- Bomb threat

Responsibilities in an Emergency Situation

The SITE / LOCATION MANAGER will have overall responsibility for any emergency that occurs on their project/office. They will fill the role of CHIEF WARDEN.

The CHIEF WARDEN & DEPUTY CHIEF WARDENS will maintain their training to enable them to coordinate the emergency response for their project/office, including accounting for all persons on site & conducting regular drills. On existing facilities it is the Chief Warden's responsibility to notify and be point of contact in the event of any emergencies or incidents that may affect these facilities and or personnel.

The CONSTRUCTION MANAGER, OHS MANAGER and DIRECTOR/S will provide support to the SITE/LOCATION MANAGER to manage any emergency; including preparation of communications that the DIRECTOR will have with the client/media/other external bodies.

All persons on site [contractors, visitors, site based personnel and non-site based personnel] must follow any directions of the CHIEF WARDEN.

Responsibilities

It is the responsibility of all MANAGEMENT & WORKERS that hazards & safety issues are resolved as quickly as possible.

CONTRACTORS must provide the following:

- Names & contact numbers of their nominated Wardens & Deputy Wardens in writing at the commencement of their works on site & whenever the details change
- Specialized equipment & training for dealing with emergencies that may arise as a result of their works [such as First Aiders, First Aid Kits, Fire Extinguishers, etc.]

Procedure – Emergency Response

EMERGENCY RESPONSE – PLANNING & TRAINING

Prior to establishment of a Qanstruct site, the CONSTRUCTION MANAGER and OHS MANAGER will prepare a site Emergency Response procedure which will include:

- Project Risk Assessment identifying site specific Emergency Response requirements
- Site Emergency Information Sheet; and
- First Aid Assessment

Upon establishment of a Qanstruct site, the SITE MANAGER will:

- Display the Site Emergency Information on the site sheds & noticeboard/s; &
- Display a Site Plan identifying First Aid Locations and the Evacuation Assembly point/s (two) in the site sheds
- Review the First Aid Assessment, make contact with surrounding businesses if their activities / our works may impact the Emergency Response procedure [particularly if the project is an alteration or extension to an existing building] & consult the CONSTRUCTION MANAGER if any changes are required
- Establish a Site Induction which details the site Emergency Response procedure
- Display Wardens and First Aiders information on notice boards.

Where Qanstruct staff are involved in maintenance & other minor works on an existing facility, Qanstruct staff & subcontractors will complete the existing facility's Site Induction, including details of the site's Emergency Response Plan [warning signals, evacuation point, etc.]

Adequate personnel will be trained to respond to emergency situations in the workplace. Training for Emergency Response personnel is detailed in the Skills Matrix.

Emergency drills will be conducted at least quarterly and recorded on the Evacuation Drill Register. Following the drill, a Toolbox Meeting will be held to discuss the findings of the drill & amend the site Emergency Procedures if required.

EMERGENCY RESPONSE – EMERGENCY RESOURCES

Each company on the project will provide adequate First Aid trained persons and facilities for their works. Where works may cause a fire, the work crew will also provide Fire Extinguishers and persons trained to use them. A register of Fire Fighting Equipment will be maintained by all companies providing this equipment.

Qanstruct will provide at least one FIRST AID OFFICER and First Aid Kit on every site. The FIRST AID OFFICER will be trained to Level 2 First Aid and be immunised for Hepatitis B. The First Aid Assessment (Form 26) will determine the number of FIRST AID OFFICERS and number & type of First Aid Kits. It will be the First Aid Officers (OHS Rep) responsibility to check and maintain the First Aid Kits onsite.

EMERGENCY RESPONSE – EMERGENCY EVACUATION DRILLS

In order to test the effectiveness of the Emergency Evacuation procedure Qanstruct will conduct evacuation drills, involving contractors on site, at the nominated time of the drill.

The SITE MANAGER will be responsible for initiating trial evacuation drills, these Emergency Evacuation Drills are to be scenario based determined by the Project Risk Assessment and held every 3 months. The drills will be recorded on the Project Evacuation Drill Register. Once Evacuation Drill completed the Site Emergency Drill is to be completed for debrief purposes.

Precinct H Enfield NSW (Goodman) will be assessed on an individual basis to determine if more drills are required during the project life.
The assessment shall consider the following:-

- The type and scale of the project;
- The site location and surrounding environment;
- The number of trades on site at any given time;
- The turnover of trades and personnel on site; and
- The risk level of works being carried out on site at any given time

Sub-contractors will be advised of the time and date of the drill in advance so that continuity of critical works can be scheduled around the drill time and arrangements made for skeleton crews to remain on site, if necessary.

Note that on sites where Emergency Evacuation Signals utilise hand held air horns, additional air horns are to be brought in for each drill. Under no circumstances are the site air horns to be used for any drills.

The emergency evacuation signals (whether installed or hand held horns) shall be tested weekly to ensure correct operation. The Site Manager is responsible for initiating the weekly test in conjunction with the OH&S representative. Maintenance of the emergency evacuation signals is the Site Manager's responsibility.

The OHS&E Manager will be responsible initiating annual evacuation drills for all office based staff at Qanstruct's head office. The annual evacuation drills will be conducted and recorded on Form 36 (Project Evacuation Drill and Site Emergency Drill).

EMERGENCY RESPONSE – EMERGENCY RESPONSE

Emergency response plans have been prepared for likely emergency scenarios, see below.

Qanstruct's Incident Management Procedure provides instructions for incident reporting and investigation [including site preservation] as well as details of Qanstruct's Employee Assistance Program.

Procedure – Crisis Management

CRISIS MANAGEMENT – INTERNAL COMMUNICATIONS

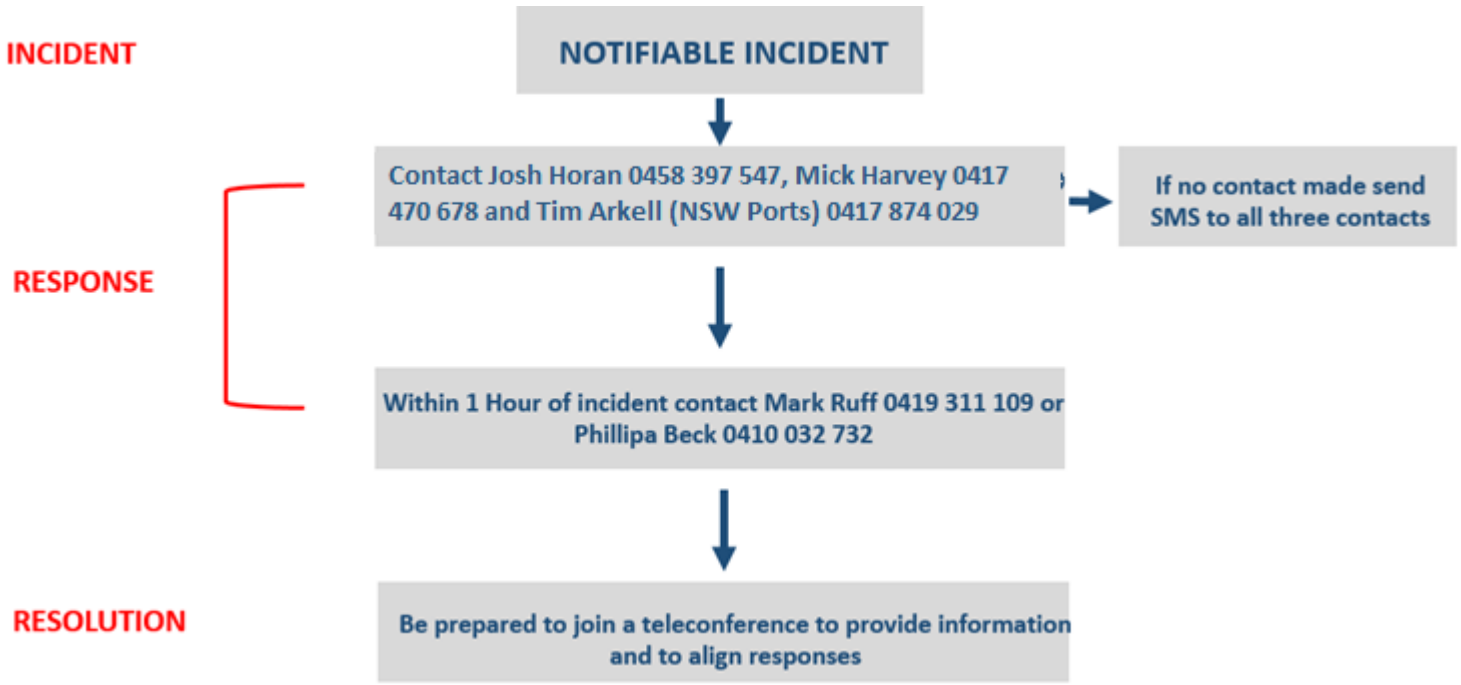
In the event of a **serious or notifiable incident**, it is **critical** that all stakeholders are contacted & advised on the incident.

Qanstruct defines a SERIOUS or NOTIFIABLE INCIDENT as:

- An ambulance or police are called to site
- Structural collapse [this includes scaffold collapse]
- Plant overturning
- Statutory reportable & notifiable incident, including:
  - WorkCover
  - EPA
  - OFSC, etc.
- An incident that has the potential for media attention

SITE MANAGER

As soon as possible after the incident, the SITE MANAGER must inform the CONSTRUCTION MANAGER and/or HEAD OF SAFETY & ENVIROMENT of the incident.
This must happen **within 30 minutes** of the incident occurring. If no contact can be made, an SMS must be sent.
If no contact can be made with either the CONSTRUCTION MANAGER or the OHS MANAGER within 1 hour of the incident occurring, contact Mark Ruff. Be sure to utilise all forms of communication at your disposal, including SMS, voicemail & email.
Be prepared to join a teleconference, as required, to provide information & align responses.



CONSTRUCTION MANAGER &/OR OHS MANAGER

At this point, based on the information from the Site Manager, the Construction Manager and OHS Manager will contact the Director to make a determination of further persons to communicate with, including:

- Local regulator
- Next of kin of persons involved in the incident
- Office of the Federal Safety Commission
- Client

A teleconference may be called to include the SITE MANAGER, CONSTRUCTION MANAGER, OHS MANAGER and DIRECTOR to establish what has occurred & determine Qanstruct's response, if any, and plan any future actions.

QUESTIONS THAT SHOULD BE ASKED IN THE TELECONFERENCE	
What has happened?	
How did this incident take place?	
What is the severity of the incident?	
Was there involvement of any Qanstruct employee / subcontractor? To what extent?	
Extent of Injury / Fatality:	□ Involved in incident and sustained serious injury □ Involved in incident but sustained non-serious injury □ Involved in incident but not injured □ Witness / Bystander
Are there any indications that a Qanstruct employee / subcontractor may have contributed to this incident?	
What is the Qanstruct response to this incident?	□ Proactive – materials to be prepared to proactively manage the media □ Reactive – response to be prepared in the event of media contact □ No response / no comment – client or other to respond
Who will prepare the materials?	
Who will respond to the media on Qanstruct's behalf?	Mark Ruff
What other actions should be taken?	□ Contact with the family □ Provision of counsellors □ Contact with unions □ Internal communications with employees and /or subcontractors
What are Qanstruct's next steps regarding this site?	

CRISIS MANAGEMENT – EXTERNAL COMMUNICATIONS

Deaths or serious injuries can result in intensive media scrutiny. In such emotional circumstances, it can be easy to say things that you may not necessarily have meant to say, particularly is pressured by a journalist. The following guidelines will help people respond should they be approached by the media before the appropriate response has been determined in the teleconference.

- Qanstruct's contact for media enquires will be a DIRECTOR.
- Wherever possible, Qanstruct representatives should avoid speaking to the media if they are not the nominated spokesperson.
- However, you should not give the appearance of 'dodging' the media as this will give the impression that we have something to hide.

If you are unable to avoid speaking to the media, your most appropriate response will be:

"This is a tragedy and we are very upset by what has happened. At the moment, we are working with the relevant authorities to investigate what has happened and it would not be appropriate for me to comment until we have the full picture. As soon as we know what has taken place, we will be responding to any queries."

- Take the name, publication and contact phone number of the journalist for follow up.
  Provide this information, along with a synopsis of your response to Qanstruct's legal advisors as appropriate.

- **Under no circumstances** should any person proactively approach the media regarding a serious / notifiable incident prior to the teleconference and determination of the strategy going forward. This includes using social media (texting, Facebook etc.) to inform others of an incident.

POST EMERGENCY MANAGEMENT

The management of people's emotional state as a result of an incident requires careful management. **Demobilisation, defusing** and **debriefing** are essential steps that will:

- Lessen the impact of the critical incident events on people and Qanstruct
- Lessen the time lost in recovery
- Restore people to good health

Suitably trained personnel should be used to facilitate this process. Qanstruct's preferred supplier for post emergency management is Life Resolutions.

EMPLOYEE ASSISTANCE PROGRAM [EAP]

Qanstruct also recognizes that regardless of involvement with a workplace incident, many workers at some point in their lives, experience feelings of depression, anger, anxiety or stress. Qanstruct has engaged **Life Resolutions** to provide its employees, individual, confidential, counselling and support services including conflict resolution, trauma counseling.

If required, a Qanstruct employee can contact Life Resolutions directly, who will arrange a **confidential counselling session**. Qanstruct will pay for 3 such sessions, where the bill does not identify the worker. If further sessions are required, the employee can fund these sessions or speak with a Director to determine if Qanstruct will fund further sessions.

To contact Life Resolutions, individuals can:

1. Call 1300 668 256, between 8:30am – 8:30pm.

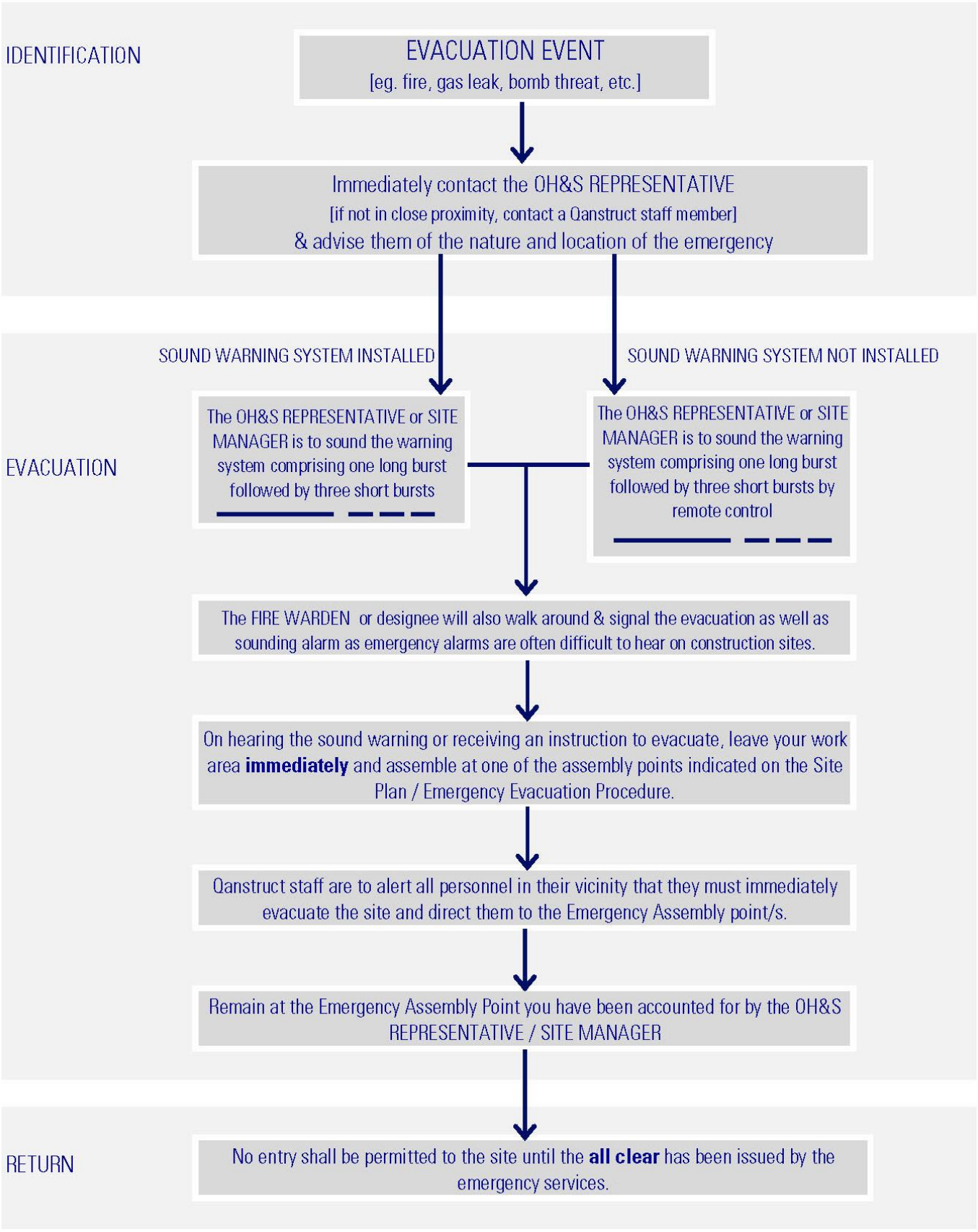
2. Outside these hours, call Lifeline on 13 11 14.

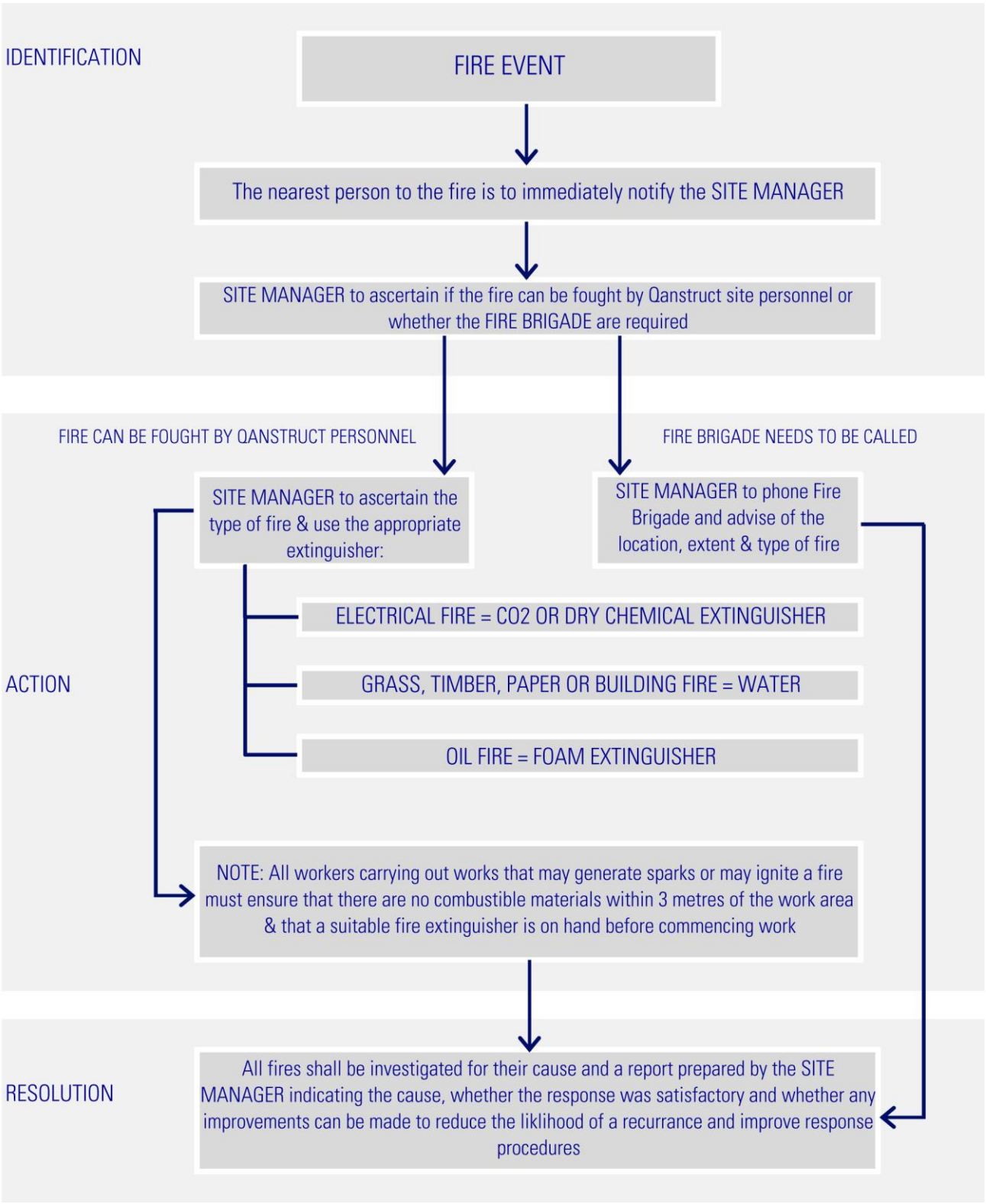
3. Explain that you work for Qanstruct [and we are an EAP client].

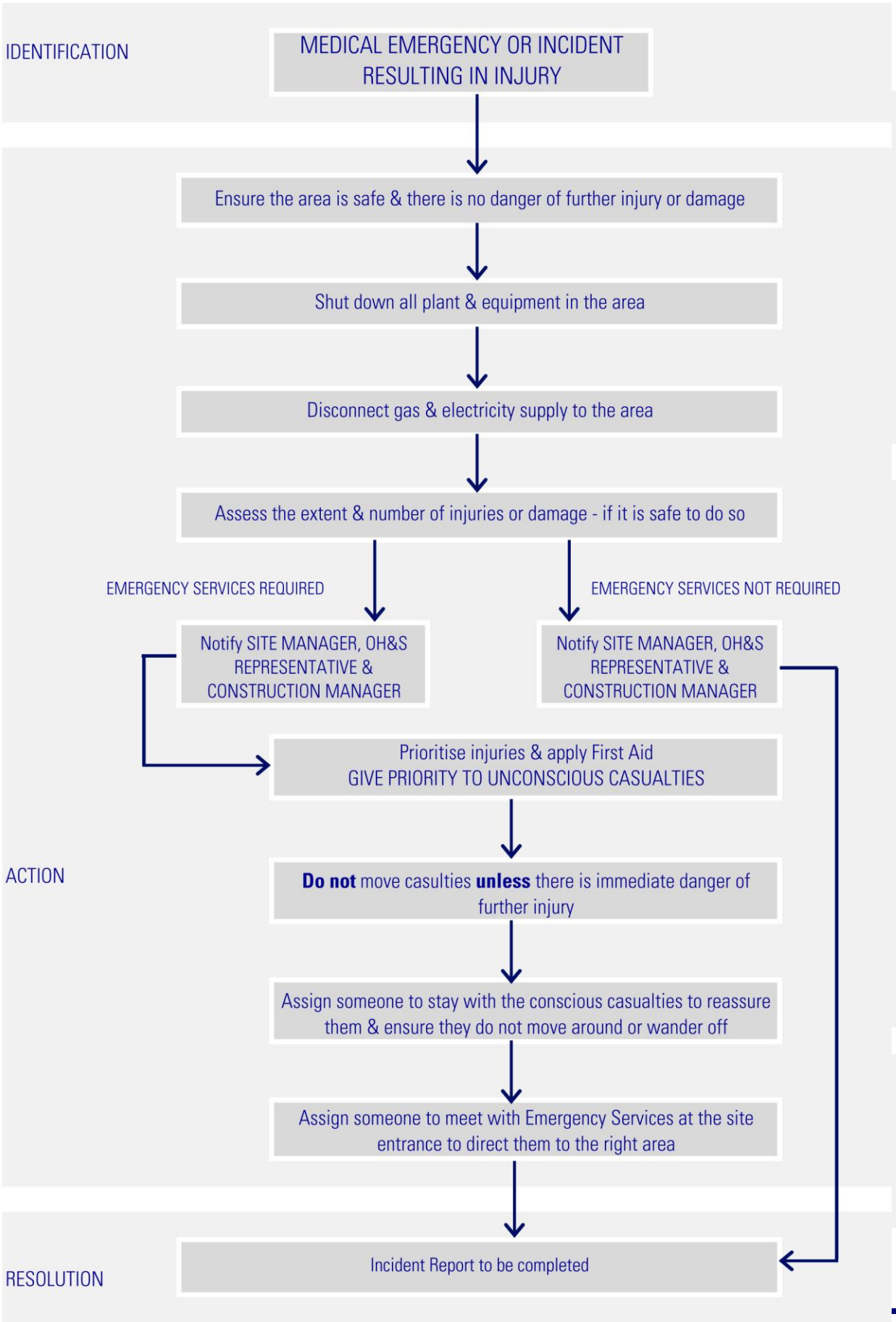
4. They will ask you what are your issues, the main issue you want to discuss and then arrange a face to face appointment with a local psychologist.

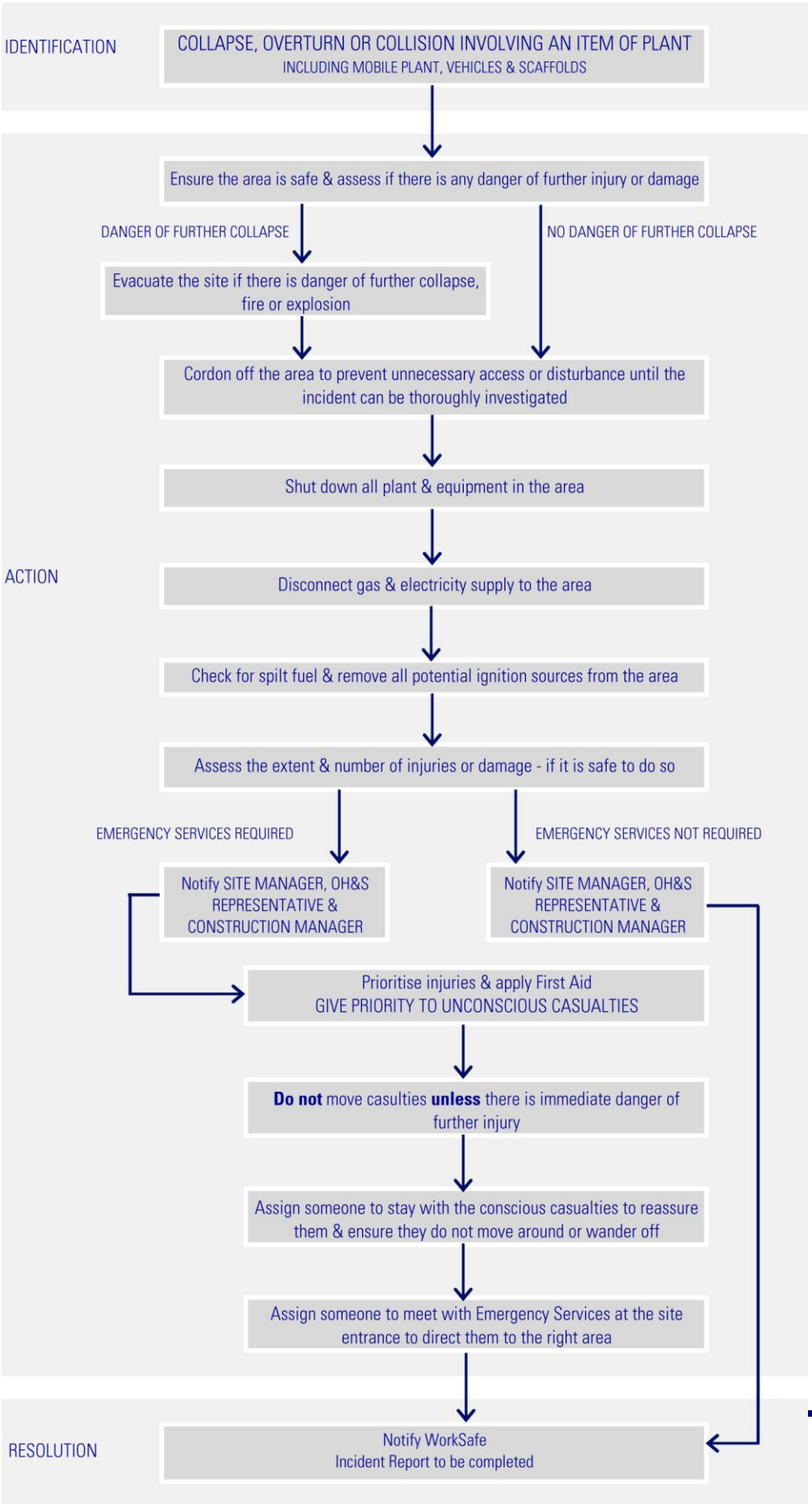
5. The local psychologist will follow up with a phone call to you and confirm your face to face appointment with them.

6. You will attend your face to face appointment with the psychologist which is confidential and 3 sessions will be paid by Qanstruct.
   If additional services are required, then please speak to Andrew, Mark, Tony, Clem or Mick.


IDENTIFICATION
EVACUATION EVENT
[eg. fire, gas leak, bomb threat, etc.]
Immediately contact the OH&S REPRESENTATIVE
[if not in close proximity, contact a Qanstruct staff member]
& advise them of the nature and location of the emergency
SOUND WARNING SYSTEM INSTALLED
SOUND WARNING SYSTEM NOT INSTALLED
EVACUATION
The OH&S REPRESENTATIVE or SITE MANAGER is to sound the warning system comprising one long burst followed by three short bursts
The OH&S REPRESENTATIVE or SITE MANAGER is to sound the warning system comprising one long burst followed by three short bursts by remote control
The FIRE WARDEN or designee will also walk around & signal the evacuation as well as sounding alarm as emergency alarms are often difficult to hear on construction sites.
On hearing the sound warning or receiving an instruction to evacuate, leave your work area immediately and assemble at one of the assembly points indicated on the Site Plan / Emergency Evacuation Procedure.
Qanstruct staff are to alert all personnel in their vicinity that they must immediately evacuate the site and direct them to the Emergency Assembly point/s.
Remain at the Emergency Assembly Point you have been accounted for by the OH&S REPRESENTATIVE / SITE MANAGER
RETURN
No entry shall be permitted to the site until the all clear has been issued by the emergency services.


IDENTIFICATION
FIRE EVENT
The nearest person to the fire is to immediately notify the SITE MANAGER
SITE MANAGER to ascertain if the fire can be fought by Qanstruct site personnel or whether the FIRE BRIGADE are required
FIRE CAN BE FOUGHT BY QANSTRUCT PERSONNEL
FIRE BRIGADE NEEDS TO BE CALLED
SITE MANAGER to ascertain the type of fire & use the appropriate extinguisher:
SITE MANAGER to phone Fire Brigade and advise of the location, extent & type of fire
ACTION
ELECTRICAL FIRE = CO2 OR DRY CHEMICAL EXTINGUISHER
GRASS, TIMBER, PAPER OR BUILDING FIRE = WATER
OIL FIRE = FOAM EXTINGUISHER
NOTE: All workers carrying out works that may generate sparks or may ignite a fire must ensure that there are no combustible materials within 3 metres of the work area & that a suitable fire extinguisher is on hand before commencing work
RESOLUTION
All fires shall be investigated for their cause and a report prepared by the SITE MANAGER indicating the cause, whether the response was satisfactory and whether any improvements can be made to reduce the liklihood of a recurrance and improve response procedures


IDENTIFICATION
MEDICAL EMERGENCY OR INCIDENT RESULTING IN INJURY
Ensure the area is safe & there is no danger of further injury or damage
Shut down all plant & equipment in the area
Disconnect gas & electricity supply to the area
Assess the extent & number of injuries or damage - if it is safe to do so
EMERGENCY SERVICES REQUIRED
EMERGENCY SERVICES NOT REQUIRED
Notify SITE MANAGER, OH&S REPRESENTATIVE & CONSTRUCTION MANAGER
Notify SITE MANAGER, OH&S REPRESENTATIVE & CONSTRUCTION MANAGER
Prioritise injuries & apply First Aid
GIVE PRIORITY TO UNCONSCIOUS CASUALTIES
ACTION
Do not move casulties unless there is immediate danger of further injury
Assign someone to stay with the conscious casualties to reassure them & ensure they do not move around or wander off
Assign someone to meet with Emergency Services at the site entrance to direct them to the right area
Incident Report to be completed
RESOLUTION


IDENTIFICATION
COLLAPSE, OVERTURN OR COLLISION INVOLVING AN ITEM OF PLANT
INCLUDING MOBILE PLANT, VEHICLES & SCAFFOLDS
ACTION
Ensure the area is safe & assess if there is any danger of further injury or damage
DANGER OF FURTHER COLLAPSE
NO DANGER OF FURTHER COLLAPSE
Evacuate the site if there is danger of further collapse, fire or explosion
Cordon off the area to prevent unnecessary access or disturbance until the incident can be thoroughly investigated
Shut down all plant & equipment in the area
Disconnect gas & electricity supply to the area
Check for spilt fuel & remove all potential ignition sources from the area
Assess the extent & number of injuries or damage - if it is safe to do so
EMERGENCY SERVICES REQUIRED
EMERGENCY SERVICES NOT REQUIRED
Notify SITE MANAGER, OH&S REPRESENTATIVE & CONSTRUCTION MANAGER
Notify SITE MANAGER, OH&S REPRESENTATIVE & CONSTRUCTION MANAGER
Prioritise injuries & apply First Aid
GIVE PRIORITY TO UNCONSCIOUS CASUALTIES
Do not move casulties unless there is immediate danger of further injury
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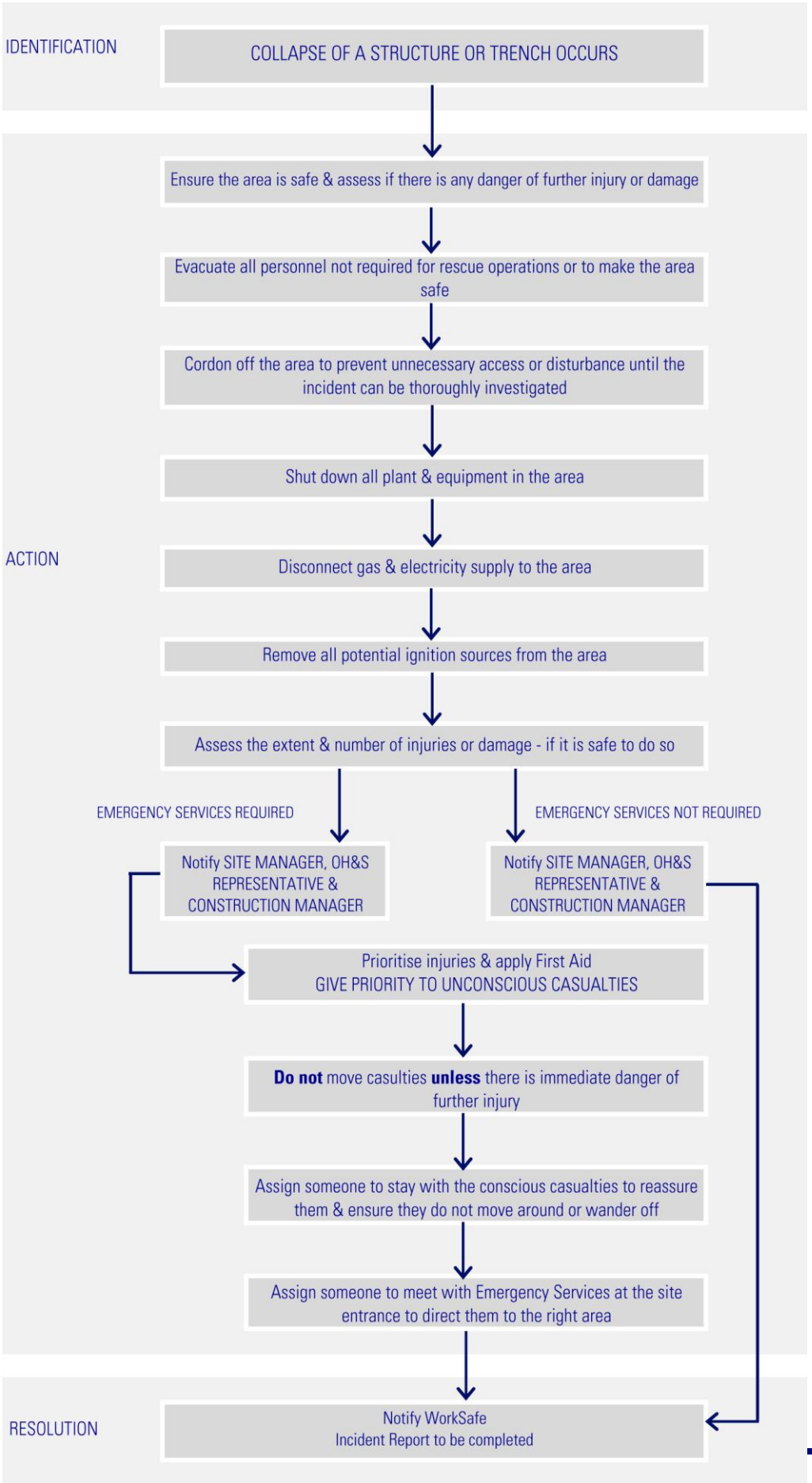
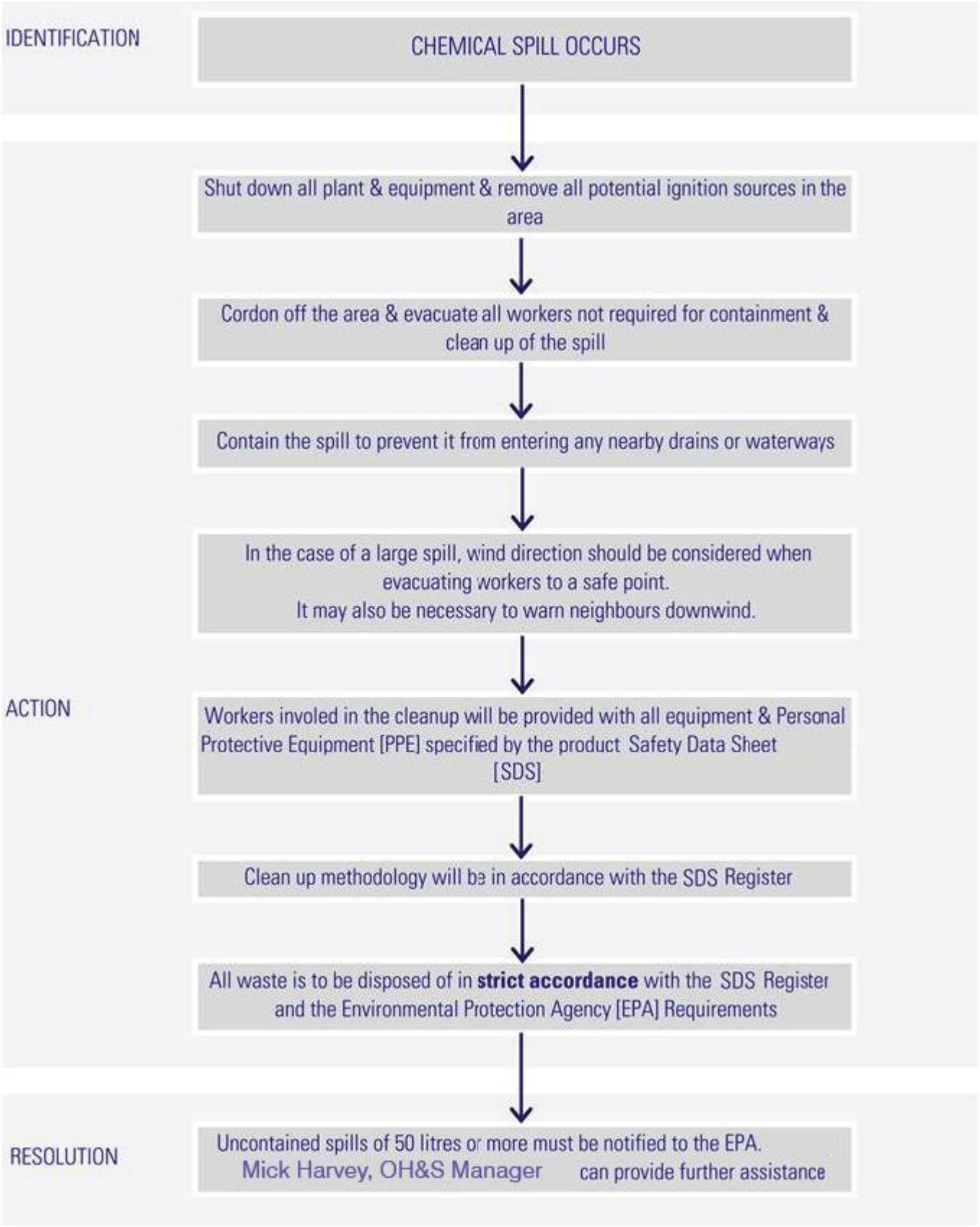
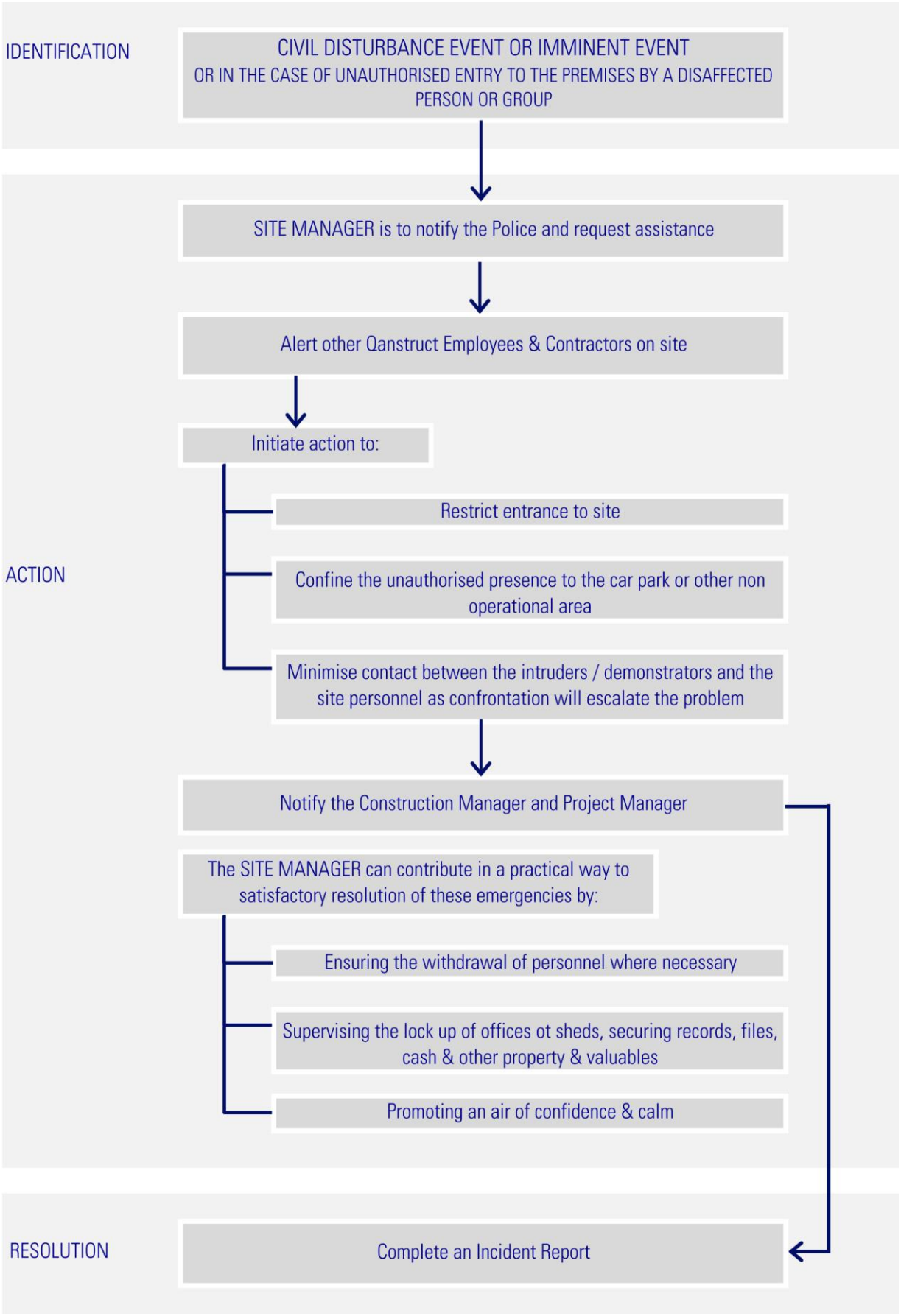
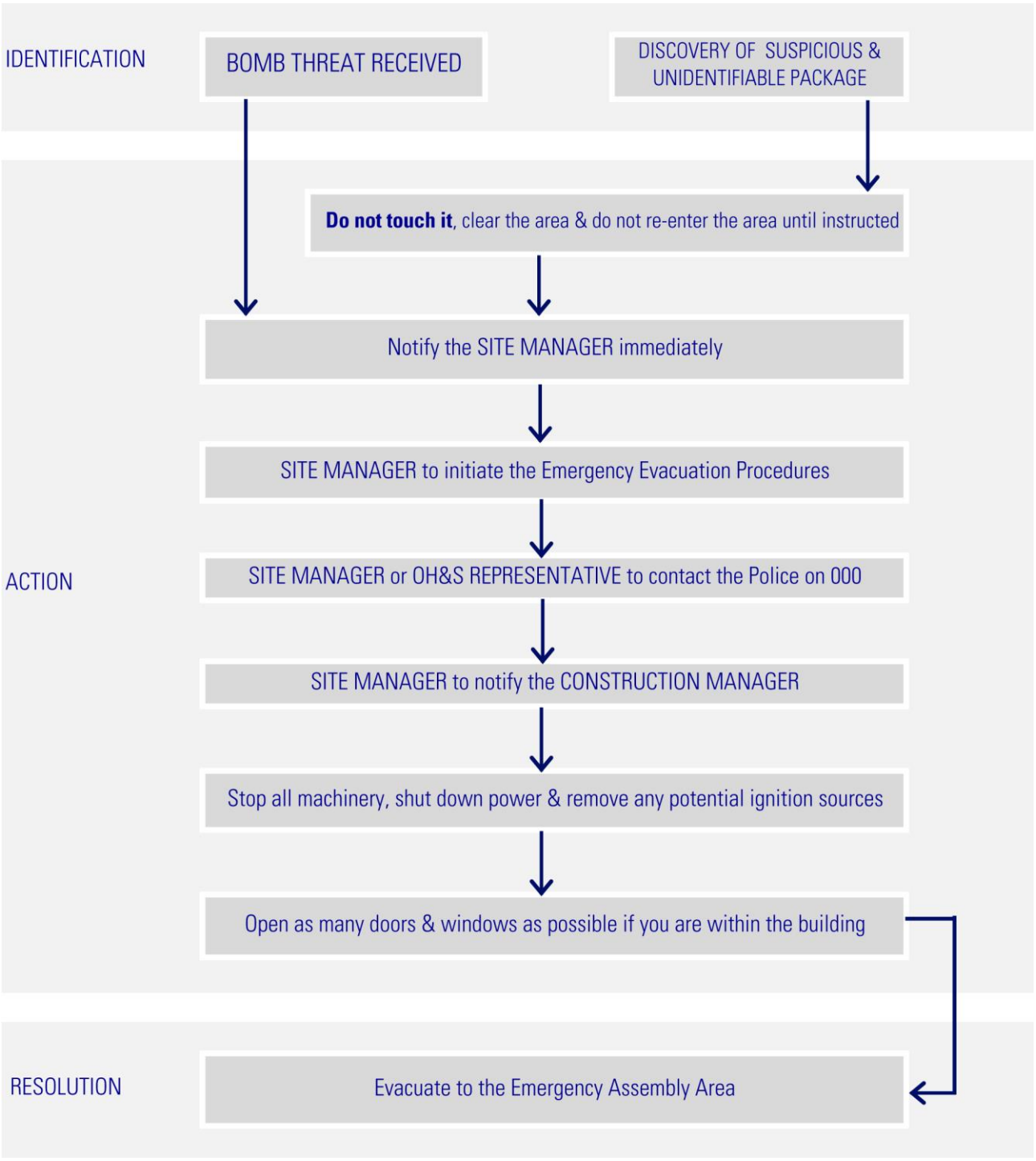
Assign someone to meet with Emergency Services at the site entrance to direct them to the right area
RESOLUTION
Notify WorkSafe
Incident Report to be completed


IDENTIFICATION
COLLAPSE OF A STRUCTURE OR TRENCH OCCURS
ACTION
Ensure the area is safe & assess if there is any danger of further injury or damage
Evacuate all personnel not required for rescue operations or to make the area safe
Cordon off the area to prevent unnecessary access or disturbance until the incident can be thoroughly investigated
Shut down all plant & equipment in the area
Disconnect gas & electricity supply to the area
Remove all potential ignition sources from the area
Assess the extent & number of injuries or damage - if it is safe to do so
EMERGENCY SERVICES REQUIRED
EMERGENCY SERVICES NOT REQUIRED
Notify SITE MANAGER, OH&S REPRESENTATIVE & CONSTRUCTION MANAGER
Notify SITE MANAGER, OH&S REPRESENTATIVE & CONSTRUCTION MANAGER
Prioritise injuries & apply First Aid
GIVE PRIORITY TO UNCONSCIOUS CASUALTIES
Do not move casulties unless there is immediate danger of further injury
Assign someone to stay with the conscious casualties to reassure them & ensure they do not move around or wander off
Assign someone to meet with Emergency Services at the site entrance to direct them to the right area
RESOLUTION
Notify WorkSafe
Incident Report to be completed


IDENTIFICATION
CHEMICAL SPILL OCCURS
Shut down all plant & equipment & remove all potential ignition sources in the area
Cordon off the area & evacuate all workers not required for containment & clean up of the spill
Contain the spill to prevent it from entering any nearby drains or waterways
In the case of a large spill, wind direction should be considered when evacuating workers to a safe point.
It may also be necessary to warn neighbours downwind.
ACTION
Workers involed in the cleanup will be provided with all equipment & Personal Protective Equipment [PPE] specified by the product Safety Data Sheet [SDS]
Clean up methodology will be in accordance with the SDS Register
All waste is to be disposed of in strict accordance with the SDS Register and the Environmental Protection Agency [EPA] Requirements
RESOLUTION
Uncontained spills of 50 litres or more must be notified to the EPA.
Mick Harvey, OH&S Manager can provide further assistance


IDENTIFICATION
CIVIL DISTURBANCE EVENT OR IMMINENT EVENT
OR IN THE CASE OF UNAUTHORISED ENTRY TO THE PREMISES BY A DISAFFECTED PERSON OR GROUP
SITE MANAGER is to notify the Police and request assistance
Alert other Qanstruct Employees & Contractors on site
Initiate action to:
ACTION
Restrict entrance to site
Confine the unauthorised presence to the car park or other non operational area
Minimise contact between the intruders / demonstrators and the site personnel as confrontation will escalate the problem
Notify the Construction Manager and Project Manager
The SITE MANAGER can contribute in a practical way to satisfactory resolution of these emergencies by:
Ensuring the withdrawal of personnel where necessary
Supervising the lock up of offices ot sheds, securing records, files, cash & other property & valuables
Promoting an air of confidence & calm
RESOLUTION
Complete an Incident Report


IDENTIFICATION
BOMB THREAT RECEIVED
DISCOVERY OF SUSPICIOUS & UNIDENTIFIABLE PACKAGE
Do not touch it, clear the area & do not re-enter the area until instructed
Notify the SITE MANAGER immediately
SITE MANAGER to initiate the Emergency Evacuation Procedures
ACTION
SITE MANAGER or OH&S REPRESENTATIVE to contact the Police on 000
SITE MANAGER to notify the CONSTRUCTION MANAGER
Stop all machinery, shut down power & remove any potential ignition sources
Open as many doors & windows as possible if you are within the building
RESOLUTION
Evacuate to the Emergency Assembly Area

RESPONSIBILITIES			
ACTION	PERSON RESPONSIBLE	COMPLETED?	NOTES
EMERGENCY DISCOVERED			
Notify SITE MANAGER	Worker who discovered the emergency	Y / N	
Make area safe, if it is safe to do so	Worker/s	Y / N	
Assess emergency situation	SITE MANAGER	Y / N	
Call Emergency Services 000	SITE MANAGER	Y / N	
EMERGENCY REQUIRES SITE EVACUATION			
Activate evacuation siren / air horn	SITE MANAGER	Y / N	
Evacuate to Emergency Assembly Point – checking all persons are removed from the site/area	ALL ON SITE	Y / N	
Collect visitor book, proceed to the Assembly Area & account for all persons on site	CHIEF WARDEN / DEPUTY WARDEN / SUBCONTRACTOR'S SUPERVISOR	Y / N	
Brief the Emergency Services on their arrival & provide requested assistance (within your training)	CHIEF WARDEN	Y / N	
Remain at the Assembly Point until advised that the site is all clear to re-enter	ALL ON SITE	Y / N	
Give the ALL CLEAR when appropriate	CHIEF WARDEN	Y / N	
EMERGENCY NOT REQUIRING SITE EVACUATION			
Control the situation & allocate resources. Isolate the area & be prepared to evacuate the site if it becomes necessary	CHIEF WARDEN / DEPUTY WARDEN / SUBCONTRACTOR'S SUPERVISOR	Y / N	
NOTIFIABLE INCIDENT OCCURS			
Preserve the site until directed by WorkSafe	SITE MANAGER	Y / N	
Contact Construction Manager or OHS Manager **within 30 minutes**	SITE MANAGER	Y / N	CLEM PERIN 0418 560 201 TONY CHIUCHIARELLI 0418 379 883 MICK HARVEY 0417 470 678
If no contact made within 30 minutes, contact a Director	SITE MANAGER	Y / N	MARK RUFF 0419 311 109
Notify Directors	CONSTRUCTION MANAGER / HEAD OF SAFETY & ENV	Y / N	

Determine if others need to be notified, including: • Local regulator • Next of Kin • OFSC • Client	CONSTRUCTION MANAGER / OHS MANAGER / DIRECTORS	Y / N	

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