Moorebank Avenue Realignment Works

Tract

Urban Design and Landscape Plan

Design Report

Prepared for Arcadis

Tract
Gamaragal Country
Level 8, 80 Mount Street, North Sydney NSW 2060
(02) 9954 3733
www.tract.com.au

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Acknowledgement of Country

We pay our respects to the Traditional Custodians of Country throughout Australia, their Elders and ancestors, recognising their rich heritage and enduring connection to Country and acknowledging the ongoing sovereignty of all Aboriginal and Torres Strait Islander Nations.

We recognise the profound connection to land, waters, sky and community of the First Nations peoples, with continuing cultures that are among the oldest in human history. We recognise that they are skilled land shapers and place makers, with a deep and rich knowledge of this land which they have cared for, protected and balanced for millennia.

Our Country, 2022
88 x 119 cm Acrylic on canvas
Original artwork by
Alfred Carter
Gunaikurnai

Quality Assurance

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Project Number
223-0027-00-U-01-RP01

Revisions

No.	Date	Description	Prepared By	Reviewed By	Project Principal
01	12 January 2024	Draft for review	[redacted]	[redacted]	[redacted]
02	25 January 2024	Draft for TfNSW review	[redacted]	[redacted]	[redacted]
03	21 February 2024	Draft for TfNSW review	[redacted]	[redacted]	[redacted]
04	23 May 2024	Final Review	[redacted]	[redacted]	[redacted]

Contents

Contents

Figures

Tables

1 Introduction

1.1 Purpose

This Urban Design and Landscape Plan (UDLP) outlines the urban design and landscape strategies for the Moorebank Avenue Realignment Works (the Project).

This UDLP aims to demonstrate compliance with the Instrument of Approval SSI-100053 and Revised Management and Mitigation Measures as outlined in Section "1.6 Instrument of Approval" on page 11 and "1.7 Revised management and mitigation measures" on page 13.

1.2 Project description

Key features of the Project include:

- Realigning a section of Moorebank Avenue from approximately 130 metres (m) south of the Anzac Road/Moorebank Avenue intersection to the bridge over the East Hills railway.
- Constructing approximately 3 kilometres (km) of new road to bypass the MLP to the east, comprising:
    - a four-lane road (two lanes in each direction) in the vicinity of MPE, commencing from approximately 130 m south of the Anzac Road/ Moorebank Avenue intersection to the southeastern corner of the MPE site.
    - a two-lane road (one lane in each direction) will run from the southeastern corner of the MPE site to a point immediately north of the bridge over the East Hills railway.
- Decommissioning of the existing Moorebank Avenue road section by others and make alterations to enable it to function as restricted access to the MLP.
- Four accesses between the new road and the MLP. The accesses would include signalised intersections with auxiliary left and right turn lanes at entry points and replicate existing accesses on Moorebank Avenue.
- Constructing a central median, typically six metres wide, tapering to zero width where the new road becomes two lanes.
- Tie-ins and infrastructure adjustments to the existing Moorebank Avenue bridge over the East Hills railway and MLP.
- Constructing retaining walls.
- Visual screening fence near the Defence Joint Logistics Unit (DJLU).
- Constructing operational drainage infrastructure, onsite stormwater detention basins, and operational water quality controls (including vegetated swales, bioretention systems, and spill containment).
- Installing a culvert within Anzac Creek and extending existing culverts within watercourses/drainage lines.
- Installing road furniture, including security fencing, guideposts, traffic signs, and street lighting.
- Adjusting public utilities.
- Constructing temporary ancillary facilities, including a work site compound, lay-down areas, and construction water detention basins.

1.3 Design Methodology

Work leading to the preparation of this report has been an iterative process, developed across numerous years by varying design consultants to contribute to the overall design approach and Project outcomes, and has included a review of related policy documents, TfNSW guidelines and standards, including those listed in the EIS.

The following is a description of the Project-specific documents that have contributed to the UDLP and Project urban design outcomes.

Landscape Character and Visual Impact Assessment (LCVIA) prepared by Spackman Mossop Michaels (October 2020)

The LCVIA supported the EIS for the Moorebank Avenue Realignment Works and documented the Project's landscape character and visual impacts. It included the following:

- The existing natural landscape, including topography, soil, water, and biodiversity.
- The existing cultural landscape, including heritage values, land uses, and places of interest.
- The landscape character and character zones.
- The sensitivity of the setting.
- The magnitude of change because of the proposed elements.
- The visual impact of all proposed surface elements.
- The assessment also discussed measures to mitigate the visual impacts of proposed elements.

Environmental Impact Statement (EIS) prepared by EMM Consulting Pty Ltd (March 2021)

The EIS described the Project and presented a detailed description of the construction work needed to build it and how the realigned road would function once built. The EIS also provides an assessment of all potential environmental impacts that could occur due to the construction and operation of the Project. This includes all issues identified in the Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning, Housing and Infrastructure (DPHI).

1.4 Document Structure

This report articulates the detailed design process undertaken and presents specific urban design responses, which are presented in the following sections:

1. **Introduction:** This section provides an overview of the Project.
2. **Contextual Analysis:** This section outlines the contextual analysis of the Project and its surrounding environment.
3. **Urban Design Strategy:** This section outlines the Project's vision, objectives, and site-wide strategies to influence the urban design outcomes.
4. **Urban Design Concept:** This section outlines the Project-wide master plan and typical sections and elevations for the urban design outcomes and features across the corridor.
5. **Urban Design Elements:** This section defines the Project-wide urban design elements that have been considered along the corridor and the details associated with their material type and finish.
6. **Cultural Interpretation:** This section establishes the Aboriginal and non-Aboriginal heritage and cultural values that have underpinned the Projects design response with a commitment to embedding Connection with Country design principles. It outlines the design approach and integration of various interpretive elements across the Project.
7. **Landscape Design:** This section describes the overall landscape design intent. Building upon the broader urban design concept, the landscape design responds to the endemic vegetation communities and provides strategies to revegetate disturbed areas.
8. **Monitoring and Maintenance:** This section outlines the management and routine maintenance standards and regimes for design elements and landscaping work (including weed management).
9. **Review of Landscape Character and Visual Impact Assessment:** This section provides an overview of the landscape character and visual impact assessment of the Project.
10. **Conclusion:** This section summarises the outcomes achieved by the Project.

1.5 Key Reference Documents

The following key documents provide the policy context for the urban design outcome across the Project.

- Better Placed – An integrated design policy for the built environment of New South Wales (Government Architect NSW, 2017).
- Better Placed – Aligning Movement and Place – Outline for understanding places in relation to movement infrastructure (Government Architect of NSW, 2019).
- Sydney Green Grid – Spatial Framework and Project Opportunities (Tyrrell Studio and Office of the Government Architect, 2017).
- Greener Places – Establishing an urban Green Infrastructure policy for New South Wales (Government Architect NSW – Draft for discussion, 2017).
- Destination Management Plan (Liverpool City Council).
- Beyond the Pavement, Urban design policy, procedures and principles for roads and waterways projects, Urban Design Roads and Waterways (Transport for NSW, June 2023).
- Landscape design guideline, Design guideline to improve the quality, safety and cost effectiveness of green infrastructure on roads and streets, Urban Design Roads and Waterways (Transport for NSW, June 2023).
- Water sensitive urban design guideline, Applying water sensitive urban design principles to NSW transport projects, Urban Design Roads and Waterways (Transport for NSW, June 2023).
- Noise wall design guideline, Design guideline to improve the appearance of noise walls in NSW, Urban Design Roads and Waterways (Transport for NSW, June 2023).

Other standards and guidelines specific to urban and landscape design for the Project include the following:

- Transport for NSW Specification D&C R178 Vegetation.
- Transport for NSW Specification D&C R179 Landscape Planting.
- AS/NZS 1158.1.1:2022 Lighting for roads and public spaces.
- AS 1428.1:2021 Design for access and mobility, Part 1: General requirements for access - New building work.
- AS 1428.2 Design for access and mobility - Enhanced and additional requirements - Buildings and facilities.
- AS 1428.4.1 Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators.
- AS 2303:2018 Tree stock for landscape use.
- AS 4419:2018 Soils for landscaping and garden use.
- AS 4454:2012 Composts, soil conditions and mulches.

1.6 Instrument of Approval

The Instrument of Approval specific to this Project is listed in Table 1, along with a reference for where each condition is addressed within this UDLP.

Table 1. Instrument of Approval and Conditions relevant to this UDLP

ID	CONDITION	UDLP REFERENCE
PLACE DESIGN AND VISUAL AMENITY		
E60	The SSI must be constructed in a manner that minimises visual impacts of construction sites, including providing temporary landscaping and vegetative screening of the construction sites, minimising light spill, and incorporating architectural treatment and finishes within key elements of temporary structures that reflect the context within which the construction sites are located.	Refer to Section "9 Review of Landscape Character and Visual Impact Assessment" on page 54. EIS Appendix L Moorebank Avenue Realignment - LCVIA
GENERAL DESIGN OUTCOMES		
E61	An Urban Design and Landscape Plan must be prepared to inform the final design of the SSI and to give effect to the commitments made in the documents listed in Condition A1. The Plan does not apply to work, which for technical, engineering, or ecological requirements or other requirements as agreed by the Planning Secretary, that does not allow for alternate design outcomes.	This UDLP
E62	The UDLP must be prepared by a suitably qualified and experienced person in consultation with relevant government agencies, relevant councils, the Community Consultative Committee, established by Condition B1, and affected landowners and businesses. The UDLP must include:	*Ongoing - scope to be confirmed*
E62 (a)	• an analysis of the built, natural and community context and the urban design objectives, principles and standards for the SSI;	Refer to Section "2 Contextual Analysis" on page 16.
E62 (b)	• the design of the SSI elements including their form, materials and detail, including provisions for active transport where these form part of the project;	Refer to Section 4, Section 5 and "5.2.2 Public and Active Transport" on page 41.
E62 (c)	• the design of the project landform and earthworks;	Section 4 and Section 5.
E62 (d)	• the location of existing vegetation, areas of vegetation to be retained and proposed planting and seeding details, including the use of local indigenous species for revegetation activities;	Refer to Section "2.6 Vegetation" on page 21 and Section "7 Landscape Design" on page 48.
E62 (e)	• the location of existing heritage items and recorded Aboriginal objects;	Refer to Section "2.8 Aboriginal Heritage" on page 25
E62 (f)	• details of how Aboriginal and non-Aboriginal heritage interpretation and public art are incorporated within the design of built features, having regard to the results of any archaeological investigations;	Refer to Section "2.8 Aboriginal Heritage" on page 25 and "2.9 Non Aboriginal Heritage" on page 23. *To be further developed in Section 6*
E62 (g)	• visual screening requirements;	Refer to Section "9 Review of Landscape Character and Visual Impact Assessment" on page 54.
E62 (h)	• developed visuals, cross sections and plans showing the proposed design outcome;	Refer to Section "4 Urban Design Concept" on page 27
E62 (i)	• details of strategies to rehabilitate, regenerate or revegetate disturbed areas;	Refer to Section "7 Landscape Design" on page 48.
E62 (j)	• management and routine maintenance standards and regimes for design elements and landscaping work (including weed management).	Refer to Section "8 Monitoring and Maintenance" on page 52.

ID	CONDITION	UDLP REFERENCE
TREE REMOVAL, REPLACEMENT PLANTINGS AND REHABILITATION		
E65	• Revegetation and the provision of replacement trees must be informed by a Tree Survey undertaken during detailed design. The Tree Survey must identify the number, type and location of trees to be removed, except for trees that are offset under Condition E5. The Tree Survey must be submitted to the Planning Secretary for information with the Urban Design and Landscape Plan required under Condition E61. • Where trees will be removed, a net increase in the number of replacement trees must be provided at a ratio of 2:1, except trees that are offset under Condition E5. Replacement trees must have a minimum pot size consistent with the relevant government authority(ies) or relevant council's plans / programs / strategies for vegetation management, street planting, or open space landscaping, or as agreed by the relevant authority(ies). • *Note: For the purposes of this condition, the relevant authority is that State or local government authority that owns or manages the land on which the replacement trees will be planted.*	• Refer to Section "7.3 Tree Removal and Replacement Planting" on page 50. • Refer to Appendix B for Aboricultural Report.
E66	• Replacement and enhancement of vegetative screening along the project corridor must be undertaken in a progressive manner during construction to allow for its early establishment.	• Refer to Section "9.4 Landscape Character and Visual Impact Mitigation Strategies" on page 58.
E67	• The UDLP required by Condition E61 must include a Landscape Strategy which details the type, size, number and location of replacement trees. The report must demonstrate how replacement plantings are consistent with the requirements of Condition E65 and Condition E66.	• Refer to Section "7.3 Tree Removal and Replacement Planting" on page 50.

1.7 Revised management and mitigation measures

The revised management and mitigation measures outlined in the Moorebank Avenue Realignment - Response to Submissions (May 2021), specific to urban design are listed below with a reference to where each measure is addressed with this UDLP.

Table 2. Revised management and mitigation measures relevant to this UDLP

REFERENCE	MITIGATION MEASURE	DOCUMENT REFERENCE
HISTORIC HERITAGE		
HIH04	Where possible, trees that provide visual shielding to Glenfield Farm will be retained to minimise visual impacts to viewsheds from the farm, particularly in the southern sector where the Project would traverse vegetated land.	• Refer to Section"9.3 Review of Visual Impact Assessment" on page 56.
VISUAL IMPACT AND LANDSCAPE CHARACTER		
VIS01	Wherever feasible, ancillary sites will be located where they would have least visual impact.	• Refer to Section "1.2 Project description" on page 08.
VIS02	Detailed design of structural elements, including visual screen fences, retaining walls and retaining wall finishes, will be in accordance with Beyond the Pavement, urban design policy, procedure and design principles (Roads and Maritime, 2013) and the associated design guidelines	• Refer to Section "5 Urban Design Elements" on page 41.
VIS03	Consideration to the design of the new retaining walls will be given in order to minimise the apparent height of the walls, including planting to the base of the wall and terracing	• Refer to Section "5 Urban Design Elements" on page 41.
VIS04	New retaining walls will be designed to have a finish that relates to the character of the surrounding landscape.	• Refer to Section "5.2.4 Retaining walls" on page 42.
VIS05	Where there is sufficient space, operational water quality devices will be designed with consideration of reducing visual impacts.	• Basins have been rationalised and integrated into the overall alignment. Refer to Section "5.2.6 Drainage basins" on page 44.
VIO06	The design of temporary and permanent lighting will be undertaken in accordance with AS 1158.1- 1986 and would avoid unnecessary light spill on adjacent residents or sensitive receivers.	• Refer to Lighting Package by others.
VIS07	The removal of existing vegetation within the road corridor will be minimised	• Tree removal has been minimised although design occupies much of the corridor.
VIS08	The potential for planting of shrub species in medians and verges will be considered in detailed design, where the width of the median allows, taking into account clear zone requirements for headlight glare screening.	• Trees and shrubs have been incorporated where space permits. Refer to Section "7 Landscape Design" on page 48.
VIS09	Screen planting will be provided where feasible to proposed retaining walls to screen the Project from sensitive adjacent land uses where applicable.	• Planting to screen retaining wall is not possible due to easement and maintenance requirements. Refer to Section "5.2.5 Visual screening fence" on page 44.
ABORIGINAL HERITAGE		
ABH02	The CEMP, or equivalent, should reinforce how the cultural landscape is considered throughout the Project and detail the rehabilitation of the Project area. In discussion with the Aboriginal community, rehabilitation of areas where infrastructure is not remaining after the Project should be undertaken to determine suitable ecological communities and other factors in returning the cultural landscape as close to its current state as feasible.	• Refer to Section "6 Cultural Interpretation" on page 46 for the approach to interpretation of identified heritage items, impacts and interpretation strategies adopted across the Project.

BUSHFIRE		
BUS25	The contractor will appropriately design landscape treatments along the road corridor to reduce potential fuel risk, including use of low combustibility vegetation and regular maintenance (through slashing) and in accordance with TfNSW guidelines and relevant AS.	• Refer to Section "7.6 Bushfire Management" on page 51.

1.8 Consultation

This UDLP has been informed by a series of consultations as outlined below.

- Exhibition: The EIS was publicly exhibited from 17 March to 13 April 2021. The EIS was available to the public in electronic format on DPHI's Major Projects Website.
- Consultation prior to public exhibition: Consultation was undertaken with government agencies, key stakeholders and the community to inform the design phase and during preparation of the EIS. Consultation during this period is described in detail in Chapter 6 of the EIS (EMM 2021).
- Consultation during and post public exhibition: a summary of further consultation undertaken since submission of the EIS is described in this section.

Table 3. Consultation during and post EIS exhibition

Agency	Date	Consultation
Transport for NSW	2 February 2021	A meeting was held with Transport for NSW (TfNSW) to discuss TfNSW's submission to DPHI in relation to the Consistency Review. When Qube managed the delivery of the MAR (prior to LOGOS), regular meetings were regularly undertaken with TfNSW about other road upgrade projects that interface with the MAR.
Qube and Moorebank Intermodal Company (MIC)	9 and 23 February 2021	Following regular meetings with Defence in 2020 to discuss the Moorebank Avenue interface with the DJLU property, Qube and MIC (now National Intermodal Corporation) met to progress the resolution of these issues.
Aboriginal Stakeholders	11 March 2021	Discussion of potential impacts to cultural materials and mitigation options was conducted with registered Aboriginal parties (RAPs) prior to developing the Aboriginal Cultural Heritage Assessment (ACHA). This was undertaken onsite as part of a field survey. RAPs were also invited to comment on the draft ACHA report.
DPHI	29 April 2021	A meeting was held with DPHI to discuss the proposed response to submissions and to provide an update on the status of the ACHA report.
EPA	7 May 2021	A meeting was held with EPA to discuss the EPA submission on the Project in relation to noise, water quality and contamination.
Environment, Energy and Science Group (EESG)	10 May 2021	A meeting was held with EESG to discuss the submission on the Project, specifically in relation to biodiversity offset calculations.
Transport for NSW	14 May 2021	A meeting was held with Transport for NSW (TfNSW) to discuss a number of items on its submission on the Project.
Liverpool City Council	19 May 2021	A meeting was held with Liverpool City Council to discuss the contents of its submission on the Project.

1.8.1 Future consultation

A Community Communication Strategy (CCS) has been developed by National Intermodal to provide mechanisms to facilitate communication during construction and operation with the community and other stakeholders. The MIP Community Engagement Consultant ('the CEC') will be the primary point of contact for stakeholders and the community members with concern or enquiries relating to the MIP development. The CCS outlines the overarching project engagement tools, their purpose and who is responsible for them.

Key communication tools that will be utilised through construction and into 12 months into operation of the project will include:

- 24 hour information line that will be managed by the CEC
- Project website that will include relevant project content including assessment documents, approvals, licences, complaints register, etc. Project updates will be posted on the website.
- Community notifications regarding works being undertaken for potentially affected neighbouring property owners and businesses before undertaking major activity or milestones, including all community updates, out of hours notices, project information flyers and other communication material.
- Community consultative committee (CCS) which acts an advisory committee and is comprised of National Intermodal, Council, members of the local community, stakeholder groups and an independent chairperson. The CCC will meet quarterly.

Refer to the CCS for further detail on future consultation.

2 Contextual Analysis

2.1 Greater Sydney Context

The Project is located within the Liverpool LGA in Sydney's southwest sub-region and approximately 2.5 km south of Liverpool City Centre, refer to Figure 1. The region is experiencing rapid transformation and economic growth, underpinned by significant population growth. A substantial change in how people live, work and travel around the area will be based upon the growth in this LGA, anticipated to be the professional services, transport, and logistics sectors, including manufacturing, transport, postal and warehousing. These industries are vital contributors to the local economy of the LGA.

Over the next 20 years, driven by population growth in the Sydney metropolitan area, Liverpool CBD will become a central city in western Sydney, forming a metropolitan cluster with the Campbelltown CBD and the Western Sydney Aerotropolis.

Major urban expansion around the Western Sydney Airport and associated infrastructure will catalyse growth, providing future employment possibilities. The Greater Sydney Region Plan (Greater Sydney Commission, 2018) highlights opportunities, including future mass-transit connections between Bankstown and Liverpool, the M12 Motorway, Bringelly Road, and The Northern Road upgrades and rapid bus transport services connecting Liverpool to the Aerotropolis. The project is located approximately 800m south of the Moorebank Avenue and M5 Motorway intersections.

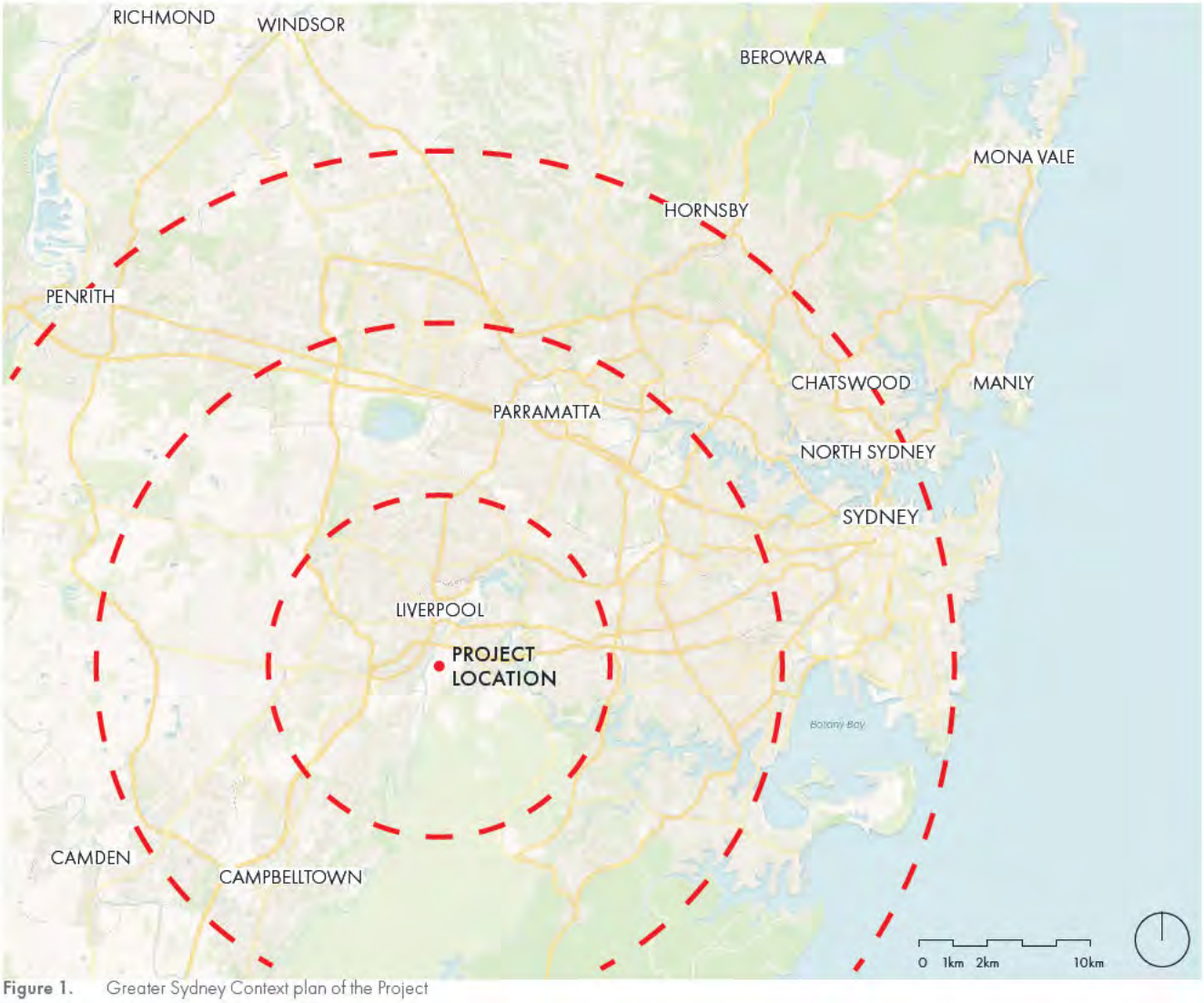


Figure 1. Greater Sydney Context plan of the Project

2.2 Local Context

The Project as shown in Figure 2, is located near several residential suburbs in Wattle Grove, Moorebank, Casula, and Glenfield, as well as several industrial precincts, including Moorebank, Warwick Farm, Chipping Norton to the north, Casula, and Glenfield to the east and south and Wattle Grove to the west. Adjacent land to the west and south of the Project contains heavily vegetated bushland and remnant vegetation housing threatened species.

2.3 Traffic and Access

Moorebank Avenue provides a north-south link between Liverpool and Glenfield. The road is currently a two-lane undivided road between Cambridge Avenue and the M5 South Western Motorway and a four-lane undivided road north of the M5 South West.

Several significant transport routes, including the M5 Motorway, Heathcote Road and Newbridge Road are important connections between Liverpool (and the outer west) and the southern Sydney suburbs.

The current layout of Moorebank Avenue provides a direct link between Glenfield, the Holsworthy Military Base, Moorebank, and the M5 Motorway, providing a link to the existing industrial areas to the north along the northern portion of Moorebank Avenue.

Figure 2. Local context plan of the Project

2.4 Landuse Zoning

The Project site is predominantly zoned as General Industrial (E4), with a heavily vegetated bushland and remnant vegetation area to the east and south of the Project, as seen in Figure 3, known as the Boot Land, zoned as Infrastructure (SP2). The industry generally comprises a mix of large-scale transport, warehousing, and distribution inter-mixed with small storage units and local construction-based activities. The surrounding suburbs of Casula to the west and Wattle Grove to the east are pockets of medium-density residential areas; however, predominantly surrounding the site and surrounding suburbs are low-density residential housing (R2) and Public Recreational Lands (RE1).

LEGEND:

E1 - Local Centre
E4 - General Industrial
C1 - National Parks and Nature Reserves
C2 - Environmental Conservation
C3 - Environmental Management
RE1 - Public Recreation
RE2 - Private Recreation
R1 - General Residential
R2 - Low Density Residential
R3 - Medium Density Residential
R4 - High Density Residential
SP2 - Infrastructure
W1 - Natural Waterways

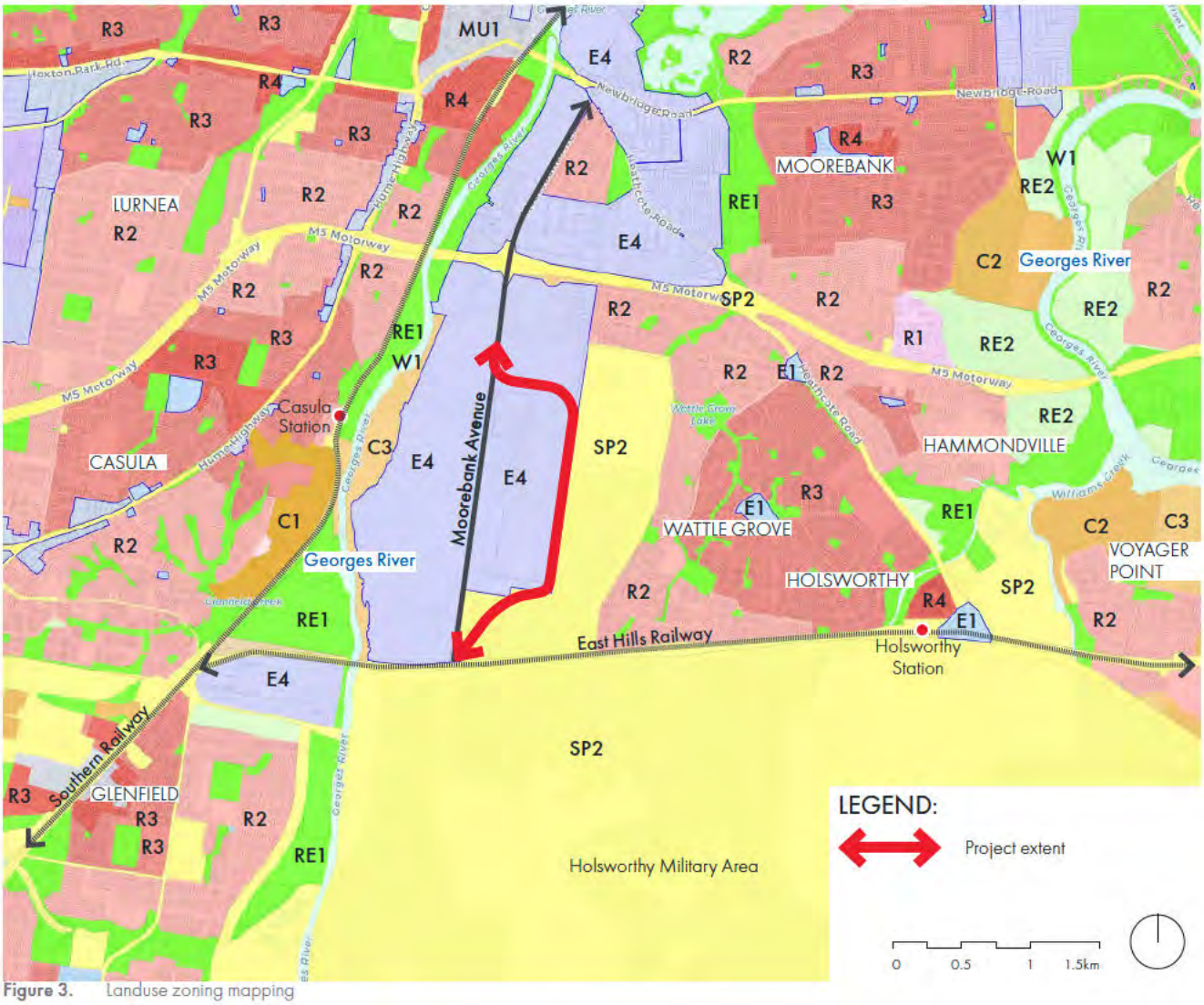


Figure 3. Landuse zoning mapping

2.5 Landform and Potential Views

The landform surrounding the Project is typical of the district, predominantly flat with gentle undulating slopes closer to the Georges River and surrounding residential areas.

To the north and northeast of the Project, large areas of industrial development are interspersed with fragmented vegetation along streets, reserves, and waterways.

To the south, the Project is encompassed by natural bushland vegetation that screens views to the Holsworthy Military Area and Wattle Grove residents in the east.

The raised landform in the south allows views from motorists over the Project along the existing Moorebank Avenue over the East Hills Railway.

Views into the Project are evident from higher ground to the west, along the Georges River and the suburb of Casula. These views are partially screened by existing vegetation in some cases, however, given the topography provides views that overlook the Project.

The site also borders a watercourse from the southeast to the southwest of the site, as seen in Figure 4.

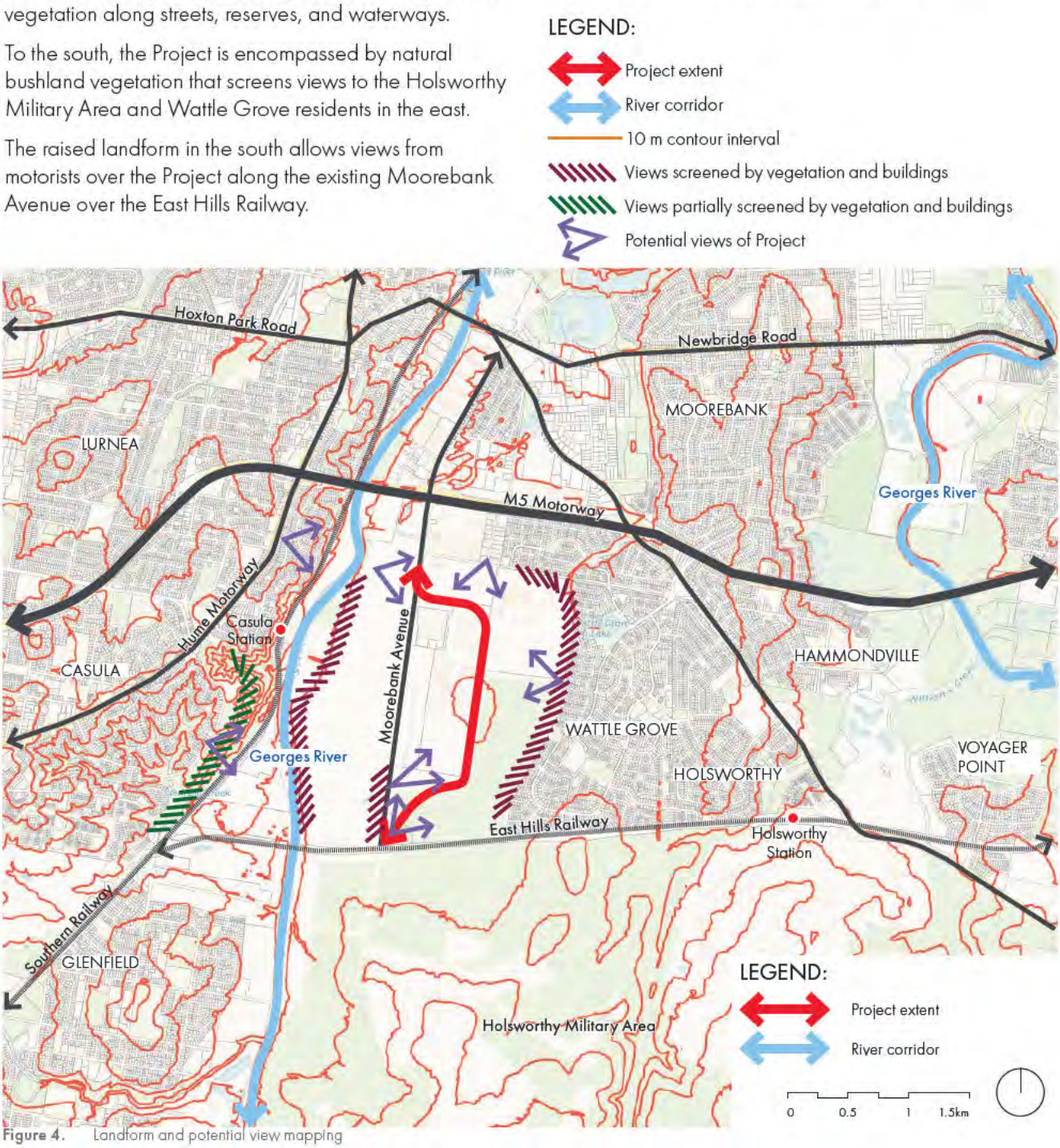


Figure 4. Landform and potential view mapping

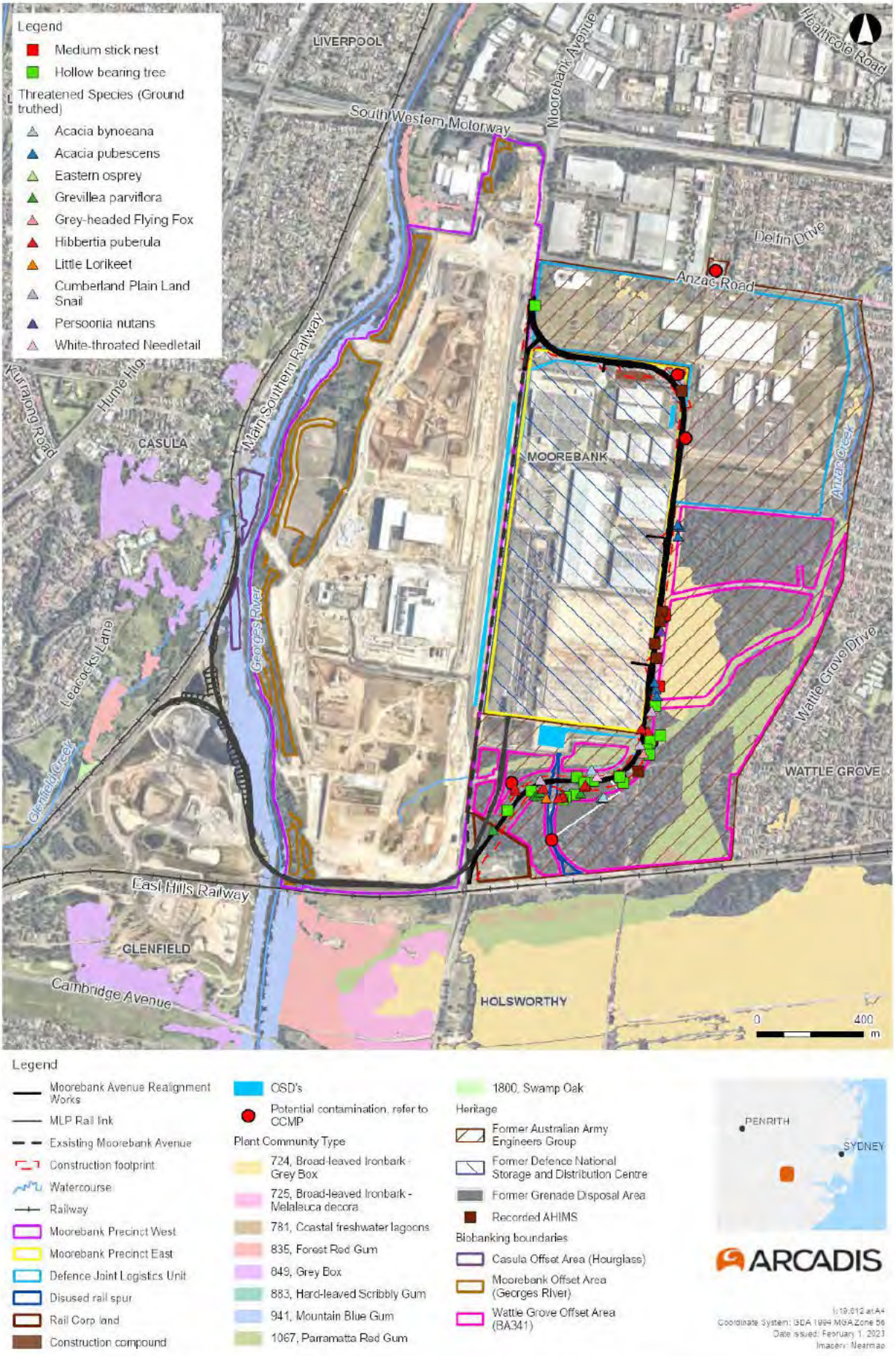


Figure 5. Sensitive areas mapping (Source: Appendix E - Moorebank Realignment Works, Construction Environmental Management Plan, Arcadis, 2023)

2.6 Vegetation

At the regional level, much of the vegetation within and surrounding the Project has been cleared and replaced with built forms and infrastructure, including roads, buildings, and playing fields. Areas not cleared have been substantially thinned, leaving only scattered remnant trees and exotic grassland.

Substantial areas of vegetation remain south of the Project, with natural bushland providing a buffer to the Holsworthy Military Area. The Project crosses the riparian zone of Anzac Creek and traverses through the adjacent Boot Land site, which contains areas of dense vegetation and ground cover. The density of the vegetation in this area provides a visual buffer to Wattle Grove.

Discrete portions of native vegetation had historically undergone periodic clearance and disturbance for Defence training activities within the Boot Land however much of the area has been left intact. The disturbed areas have since been remediated and vegetation has grown back. Through Biobanking Agreement 341, the quality of bushland in the offset sites in the area will further improve.

Vegetation communities along the project alignment include the Broad-leaved Ironbark Grey Box, Broad-leaved Ironbark – Melaleuca Decora and the Hard leaved Scribbly Gum - Parramatta Red Gum and Parramatta Red Gum refer to Figure 5.

2.7 Soil and Hydrology

The two major waterbodies in the vicinity of the Project site include the Georges River, located 1.5 km from the west of the site, running south to north, and the Anzac Creek, a tributary of the Georges River, which flows through the southern end of the site from the south-west to north-east towards Wattle Grove, refer to Figure 6.

The site comprises Kurasol soils, with Tertiary fluvial deposits of varying thickness above the bedrock. Much of the area surrounding the Project site is identified as flood-prone land, including areas to the northwest of the MPW Site, industrial and residential areas north of the M5 Motorway, and throughout the Boot Land to the southeast.

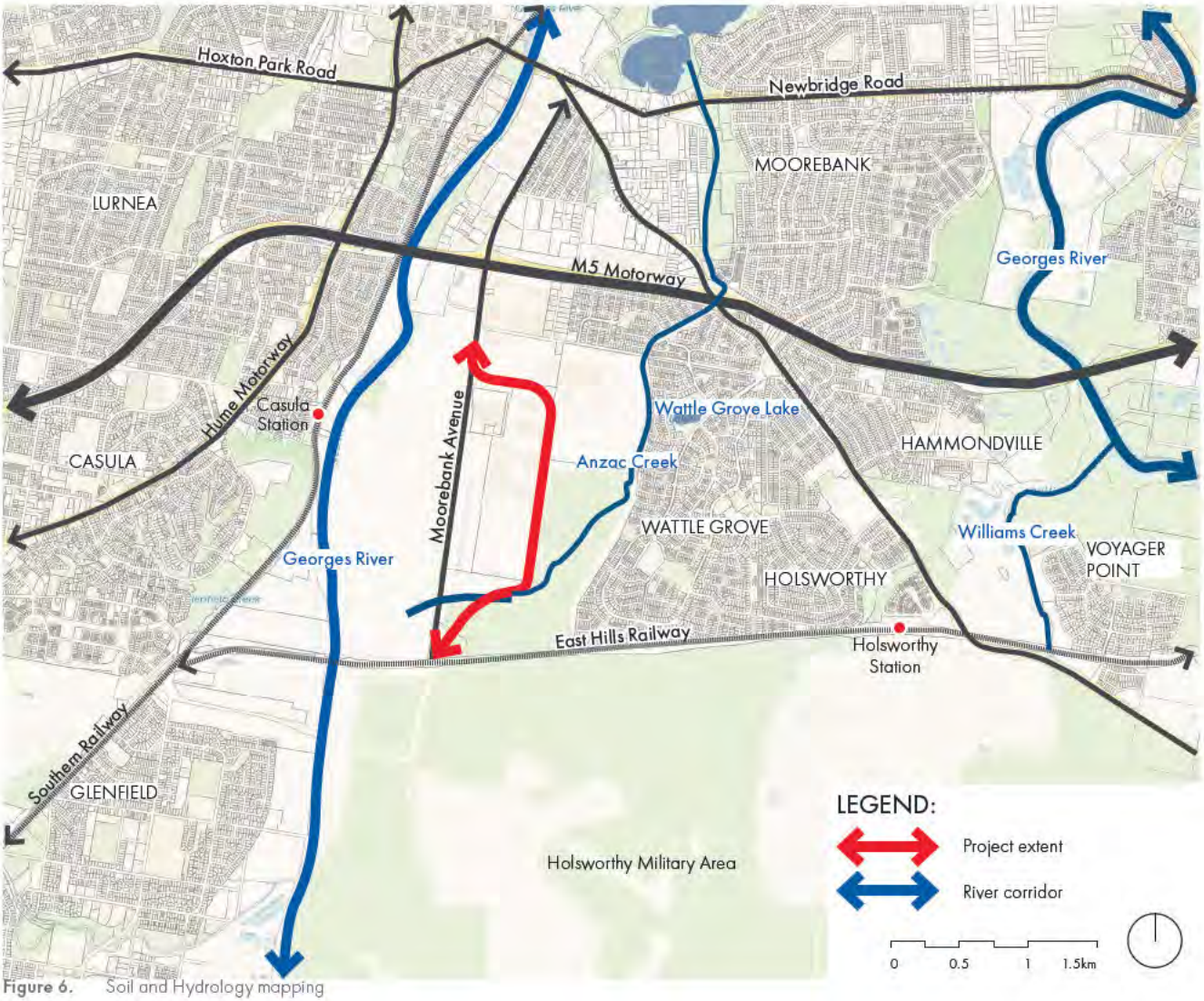


Figure 6. Soil and Hydrology mapping

2.8 Aboriginal Heritage

Desktop and field investigation undertaken for an Aboriginal Cultural Heritage Assessment (ACHA) (EMM, 2021) identified eight Aboriginal sites within the Project Site, of which one is considered destroyed and one has been discounted/declassified based on previous excavations. The Aboriginal sites are isolated finds in disturbed or heavily modified site context and are considered to have overall low archaeological significance.

Within the vicinity of the Project site sits a variety of Aboriginal Heritage items, including modified trees, Aboriginal artefacts, and potential Archaeological deposits to the west and northwest, within the MPW Site and beyond, as outlined in Figure 8.

The ACHA makes recommendations for the preparation of an Aboriginal heritage management plan to provide a framework to guide post-approval requirements for Aboriginal heritage.

A MARW Construction Heritage Management Plan (CHMP) has been prepared for the Project and includes all revised environmental management measures relevant to Aboriginal and non-Aboriginal heritage. Section 6.1 of the CHMP outlines the procedure that would be undertaken to salvage the identified Aboriginal sites within the Project site.

Figure 8. Aboriginal Heritage mapping (Source: Moorebank Realignment Works, Construction Heritage Management Plan, Arcadis, 2023)

2.9 Non Aboriginal Heritage

The potential impacts to Non-Aboriginal heritage that may arise from the Project were assessed in a SOHI (refer to Appendix H of the EIS). A survey of the Project Site was undertaken as a part of the CHMP assessment which identified that no remaining items of Non-Aboriginal heritage significance remained. While the LEP 2008 mapping identifies the Project Site as located within the item 57, the listing for this, within Schedule 5, includes a different parcel of land (i.e. the Lot and DP for the Project Site are not listed).

South of the Project sits the existing Holsworthy Military Area, recognised in the LEP as the Cubbitch Barta National Estate and the Holsworthy Group.

In addition to the LEP listed area in the south, the Project is located on previously owned Defence land, including the Boot Land, MPW and MPE Sites, which includes the Australian Army Engineers Group listed heritage site.

As shown in Figure 7, surrounding items of LEP and SHR significance include the Casula Powerhouse, the Railway Viaduct and Glenfield Farm, all located directly west of the Project site. While the Project is within the viewshed of the state significant Glenfield Farm, the potential visual impact of the Pojrect was assessed as low because the outlook of Glenfield Farm has already been interrupted by the East Hills rail line and the Glenfield waste facility.

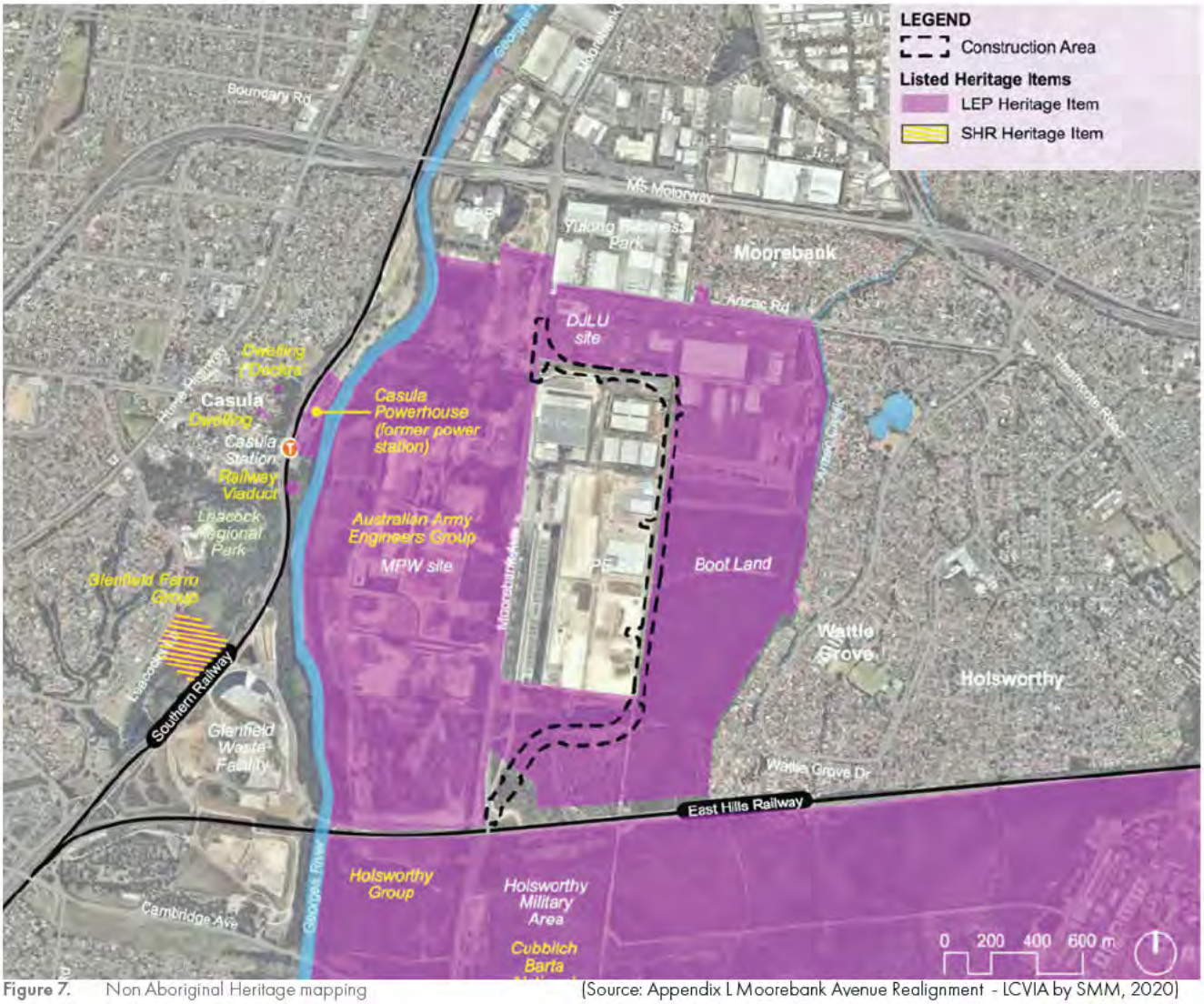


Figure 7. Non Aboriginal Heritage mapping (Source: Appendix L Moorebank Avenue Realignment - LCVIA by SMM, 2020)

3 Urban Design Strategy

3.1 Urban Design Vision

The Urban Design Vision developed as part of this UDLP is articulated below:

> *The Moorebank Avenue Realignment works will be an attractive green corridor gateway to the Moorebank Logistics Park. Its identity and landscape character draw upon its unique relationship with the vegetation communities of the Cumberland Plain Woodland.*

3.2 Urban Design Objective and Principles

Objective 1: To reinforce the local vegetation communities of the Cumberland Plain and improve the landscape character of the road corridor.

The principles to achieve this are:

- Creating Moorebank Avenue as an active transport green link connecting to the Moorebank Logistic Park.
- Maximise tree planting opportunities.
- Ensure planting reinforces the landscape character zones within the overall corridor.
- Utilise planting treatments that respond to the existing vegetation communities of the Cumberland Plain.

Objective 2: To incorporate the heritage and cultural attributes of the corridor.

The principles to achieve this are:

- To respond sensitively to the heritage, cultural and natural sites and elements that occur adjacent to the road corridor.
- Minimise the road footprint and promote a considered design response along the corridor.
- To provide a considered design response for roadside retaining walls and other structures and associated landscaping.
- Conserve existing prominent landscape features and significant views and create a distinct identifiable character.
- Maintain existing views to establish a sense of place along Moorebank Road.
- Incorporate design elements that help create a unique identity for Moorebank Avenue.

Objective 3: To achieve improved accessibility and connectivity across and along the corridor.

The principles to achieve this are:

- Consider walking, cycling and public transport modes as part of the project scope and design.
- Maintain clear, safe vehicle crossings at driveways and local road connections.
- Optimise the shared path route to create a stimulating experience for users and design to coordinate with local road connections; consider shade provision and visual interest as well as sight lines in planting design.

Objective 4: To achieve a legible experience in movement that highlights the features of the existing urban and landscape character.

The principles to achieve this are:

- Reinforce the informal parkland edges on the road corridor fringes.
- Create an avenue of street tree planting within the road corridor to create a sense of arrival.

Objective 5: To design a simple, unified and maintainable suite of road and roadside elements.

The principles to achieve this are:

- Use standard road elements such as safety barriers, pedestrian fencing, shared path fencing, traffic management, street lighting and signage in a neat, uncluttered, and well-articulated manner.
- Ensure that road furniture does not detract from or impede existing or new views along the corridor.
- Ensure that road furniture and elements are well articulated and easily maintained.

4 Urban Design Concept

4.1 Urban Design Overview

The urban design concept presented within this section has been developed and based on the Project vision, objectives, and principles to provide an integrated urban design concept for the Project.

The urban design concept identifies a series of works recommended for implementation within the identified operational footprint of the Project in conjunction with the construction of the engineering works. It seeks to provide a balance between the hard and soft elements to deliver a project that makes a positive contribution to its setting.

The urban and landscape design has been responsive to its context. This reflects the Projects presence within an environment associated with threatened communities and species. It has adopted a natural landscape response which celebrates these communities both within the plantings but also in the detailing of the walls. In adopting such an approach, it is responsive to Country through the restoration and protection of the adjoining natural communities.

The urban design concept section consists of the following elements:

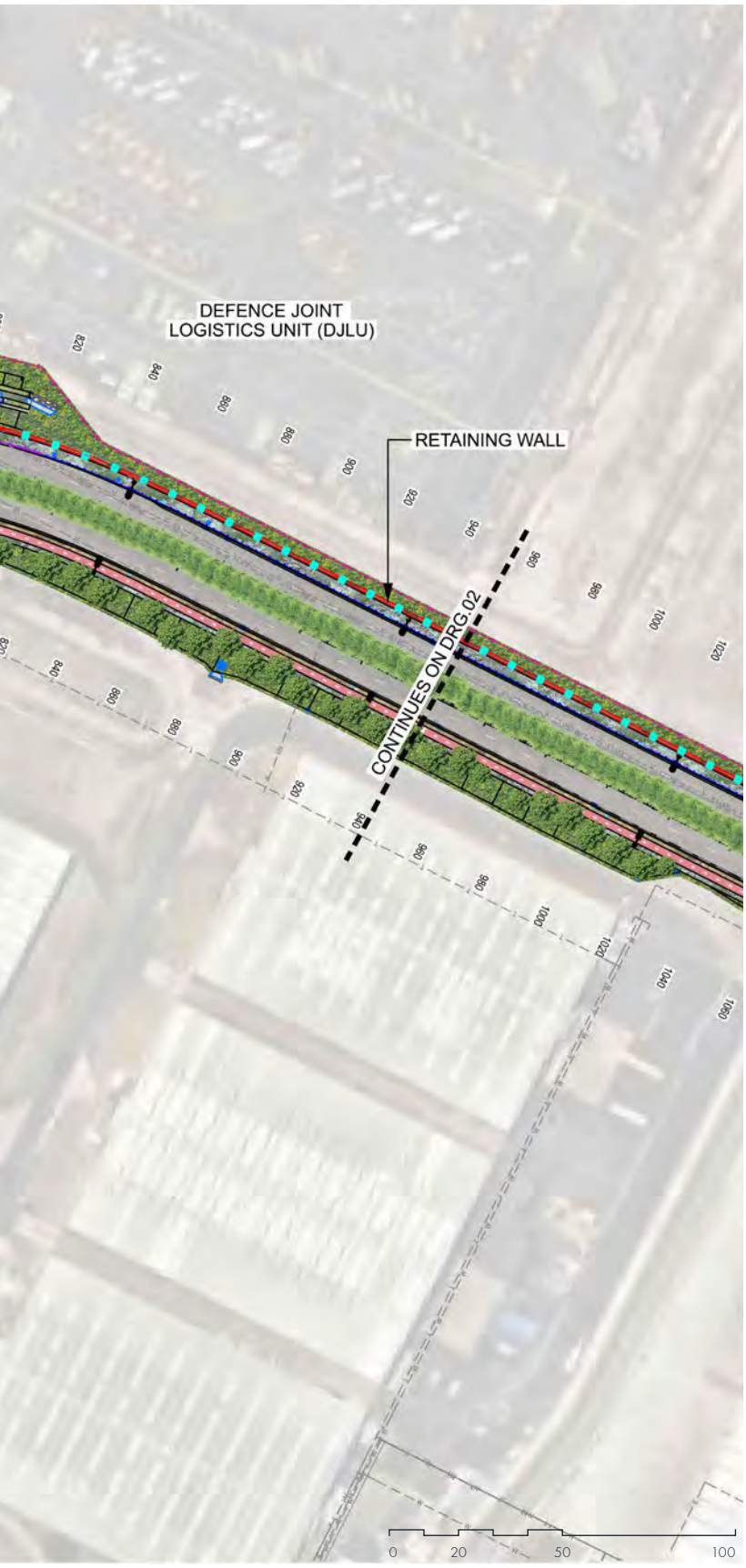
- Urban design concept plans highlighting the main project elements and urban design outcomes and opportunities.
- Typical road cross sections illustrating the alignment and interface with the various urban design and landscape planting treatments.

4.2 Urban Design Conceptual Plans

Figure 9. Urban Design Concept Plan - Drawing 01


DEFENCE JOINT
LOGISTICS UNIT-EAST
(DJLU-E)
VISUAL SCREEN WALL ON TOP OF RETAINING WALL FROM CH400 TO SOUTHERN DJLU BOUNDARY
TYPE 1 RETAINING WALL
CONTINUES ON DRG.01
EXISTING PIWE OPERATIONAL BASIN
LIMIT OF WORKS
0
20
50
100
LEGEND
PROTECTED AREA - BIO BANK
BOUNDARY FENCE
FAUNA FENCE
CHAINLINK FENCE
SYDNEY TRAIN FENCE
VISUAL SCREENING FENCE
BARRIER
REFER TO ENGINEERS DETAIL
THRIE BEAM BARRIER
REFER TO ENGINEERS DETAIL
RETAINING WALL
REFER TO ENGINEERS DETAIL
LIGHTING
REFER TO ENGINEERS DETAIL
SIGNAGE
REFER TO ENGINEERS DETAIL
HEADWALL & CULVERT
REFER TO ENGINEERS DETAIL
SCOUR PROTECTION
REFER TO ENGINEERS DETAIL
MEDIAN PAVED
SHARED PATH
MAINTENANCE ACCESS PATH
BASIN
SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE
SEED MIX 1 - WOODLAND
SEED MIX 2 - GRASSY OPEN FOREST
DRAINAGE CHANNEL
BFM OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE
MEDIAN GARDEN BED
VERGE GARDEN BED
GRASSED VERGE
100mm TURF UNDERLAY OVER
200mm CULTIVATED SUBGRADE
DRAINAGE INVERT
JUTE MESH OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE
TREE PLANTING
FEATURE TREE
BROADSCALE TREE
MEDIAN TREE

Figure 10. Urban Design Concept Plan - Drawing 02



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER
  REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER
  REFER TO ENGINEERS DETAIL
- RETAINING WALL
  REFER TO ENGINEERS DETAIL
- LIGHTING
  REFER TO ENGINEERS DETAIL
- SIGNAGE
  REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT
  REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION
  REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL
  BFM OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE

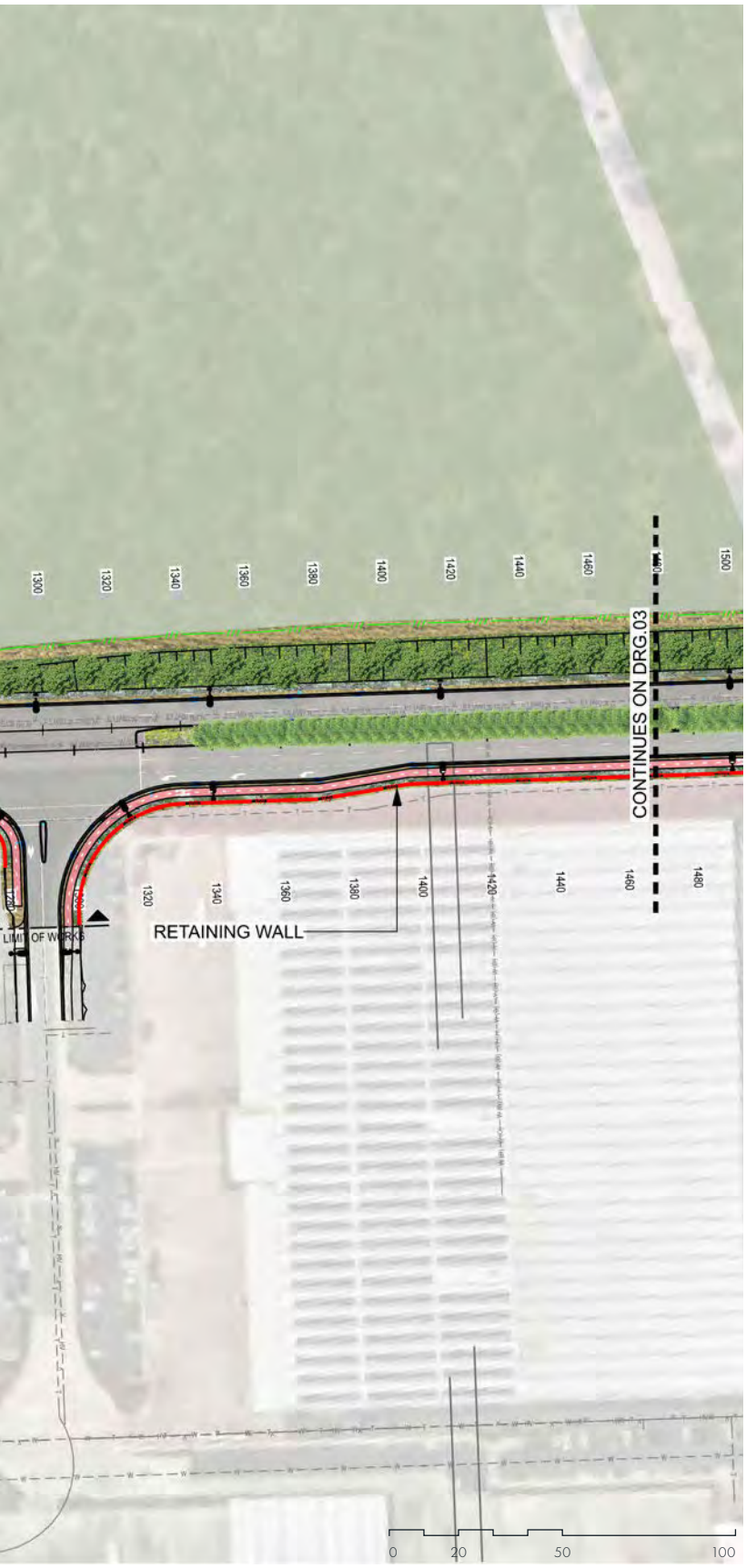
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE
  100mm TURF UNDERLAY OVER
  200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT
  JUTE MESH OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

Figure 11. Urban Design Concept Plan - Drawing 03



LEGEND

PROTECTED AREA - BIO BANK
BOUNDARY FENCE
FAUNA FENCE
CHAINLINK FENCE
SYDNEY TRAIN FENCE
VISUAL SCREENING FENCE
BARRIER
REFER TO ENGINEERS DETAIL
THRIE BEAM BARRIER
REFER TO ENGINEERS DETAIL
RETAINING WALL
REFER TO ENGINEERS DETAIL
LIGHTING
REFER TO ENGINEERS DETAIL
SIGNAGE
REFER TO ENGINEERS DETAIL
HEADWALL & CULVERT
REFER TO ENGINEERS DETAIL
SCOUR PROTECTION
REFER TO ENGINEERS DETAIL
MEDIAN PAVED
SHARED PATH
MAINTENANCE ACCESS PATH
BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

SEED MIX 1 - WOODLAND
SEED MIX 2 - GRASSY OPEN FOREST
DRAINAGE CHANNEL
BFM OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE

GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

MEDIAN GARDEN BED
VERGE GARDEN BED
GRASSED VERGE
100mm TURF UNDERLAY OVER
200mm CULTIVATED SUBGRADE
DRAINAGE INVERT
JUTE MESH OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE

TREE PLANTING
FEATURE TREE
BROADSCALE TREE
MEDIAN TREE

Figure 12. Urban Design Concept Plan - Drawing 04

LEGEND

PROTECTED AREA - BIO BANK
BOUNDARY FENCE
FAUNA FENCE
CHAINLINK FENCE
SYDNEY TRAIN FENCE
VISUAL SCREENING FENCE
BARRIER
REFER TO ENGINEERS DETAIL
THRIE BEAM BARRIER
REFER TO ENGINEERS DETAIL
RETAINING WALL
REFER TO ENGINEERS DETAIL
LIGHTING
REFER TO ENGINEERS DETAIL
SIGNAGE
REFER TO ENGINEERS DETAIL
HEADWALL & CULVERT
REFER TO ENGINEERS DETAIL
SCOUR PROTECTION
REFER TO ENGINEERS DETAIL
MEDIAN PAVED
SHARED PATH
MAINTENANCE ACCESS PATH
BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

SEED MIX 1 - WOODLAND
SEED MIX 2 - GRASSY OPEN FOREST
DRAINAGE CHANNEL
BFM OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE

GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

MEDIAN GARDEN BED
VERGE GARDEN BED
GRASSED VERGE
100mm TURF UNDERLAY OVER
200mm CULTIVATED SUBGRADE
DRAINAGE INVERT
JUTE MESH OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE

TREE PLANTING

FEATURE TREE
BROADSCALE TREE
MEDIAN TREE

Figure 13. Urban Design Concept Plan - Drawing 05

LEGEND

PROTECTED AREA - BIO BANK
BOUNDARY FENCE
FAUNA FENCE
CHAINLINK FENCE
SYDNEY TRAIN FENCE
VISUAL SCREENING FENCE
BARRIER
REFER TO ENGINEERS DETAIL
THRIE BEAM BARRIER
REFER TO ENGINEERS DETAIL
RETAINING WALL
REFER TO ENGINEERS DETAIL
LIGHTING
REFER TO ENGINEERS DETAIL
SIGNAGE
REFER TO ENGINEERS DETAIL
HEADWALL & CULVERT
REFER TO ENGINEERS DETAIL
SCOUR PROTECTION
REFER TO ENGINEERS DETAIL
MEDIAN PAVED
SHARED PATH
MAINTENANCE ACCESS PATH
BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

SEED MIX 1 - WOODLAND
SEED MIX 2 - GRASSY OPEN FOREST
DRAINAGE CHANNEL
BFM OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE

GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

MEDIAN GARDEN BED
VERGE GARDEN BED
GRASSED VERGE
100mm TURF UNDERLAY OVER
200mm CULTIVATED SUBGRADE
DRAINAGE INVERT
JUTE MESH OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE

TREE PLANTING
FEATURE TREE
BROADSCALE TREE
MEDIAN TREE

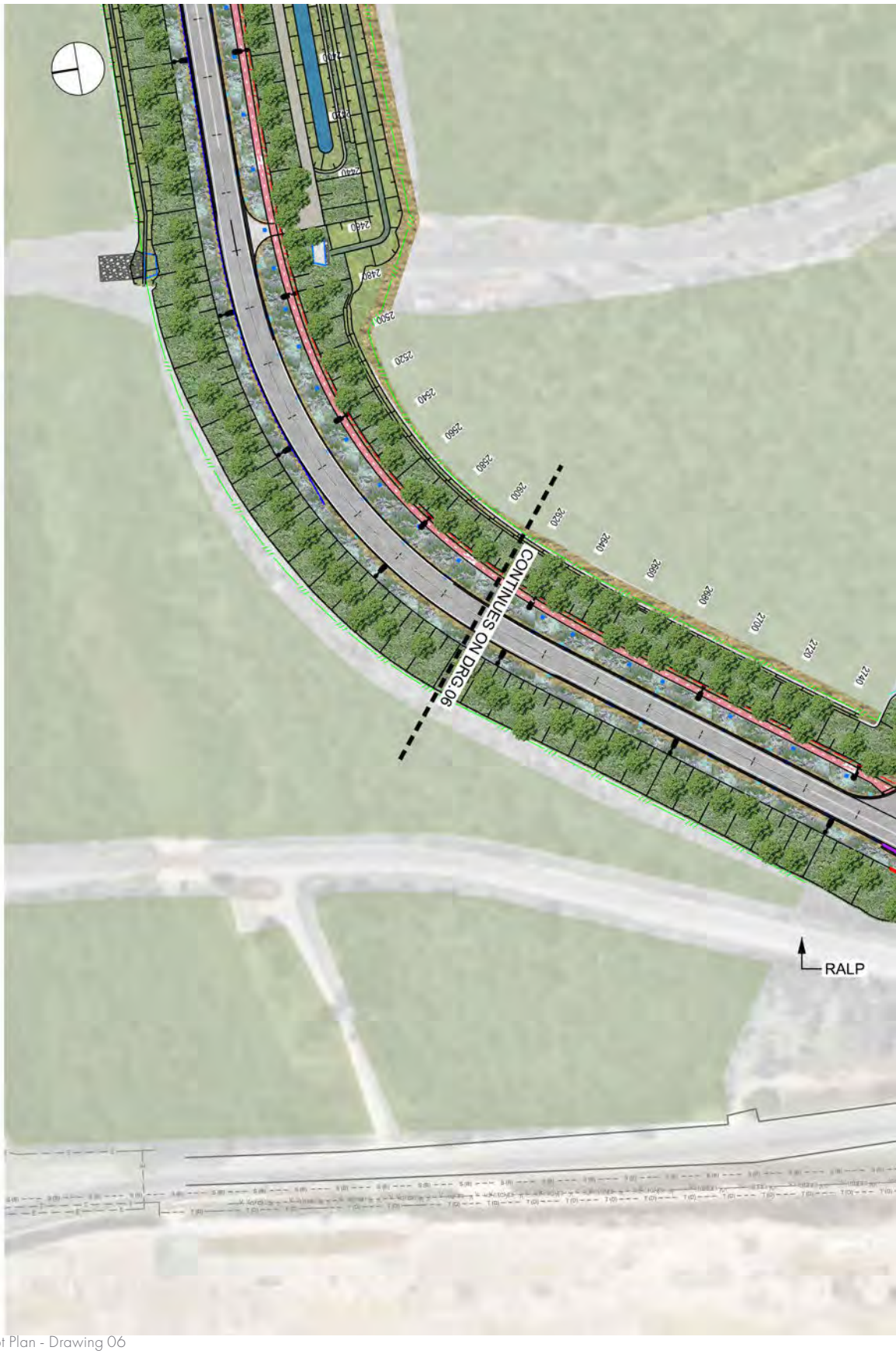


Figure 14. Urban Design Concept Plan - Drawing 06

LEGEND

PROTECTED AREA - BIO BANK
BOUNDARY FENCE
FAUNA FENCE
CHAINLINK FENCE
SYDNEY TRAIN FENCE
VISUAL SCREENING FENCE
BARRIER
REFER TO ENGINEERS DETAIL
THRIE BEAM BARRIER
REFER TO ENGINEERS DETAIL
RETAINING WALL
REFER TO ENGINEERS DETAIL
LIGHTING
REFER TO ENGINEERS DETAIL
SIGNAGE
REFER TO ENGINEERS DETAIL
HEADWALL & CULVERT
REFER TO ENGINEERS DETAIL
SCOUR PROTECTION
REFER TO ENGINEERS DETAIL
MEDIAN PAVED
SHARED PATH
MAINTENANCE ACCESS PATH
BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

SEED MIX 1 - WOODLAND
SEED MIX 2 - GRASSY OPEN FOREST
DRAINAGE CHANNEL
BFM OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE

GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

MEDIAN GARDEN BED
VERGE GARDEN BED
GRASSED VERGE
100mm TURF UNDERLAY OVER
200mm CULTIVATED SUBGRADE
DRAINAGE INVERT
JUTE MESH OVER
50mm TOPSOIL OVER
SCARIFIED SUBGRADE

TREE PLANTING
FEATURE TREE
BROADSCALE TREE
MEDIAN TREE

4.3 Urban Design Typical Sections

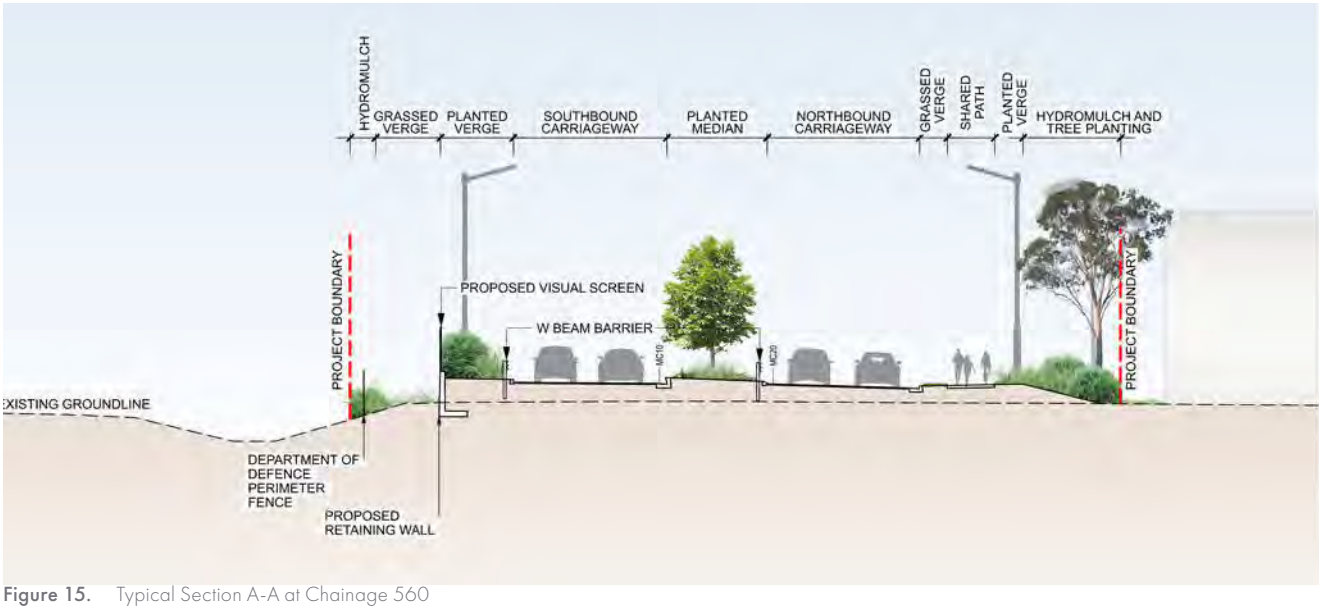


Figure 15. Typical Section A-A at Chainage 560

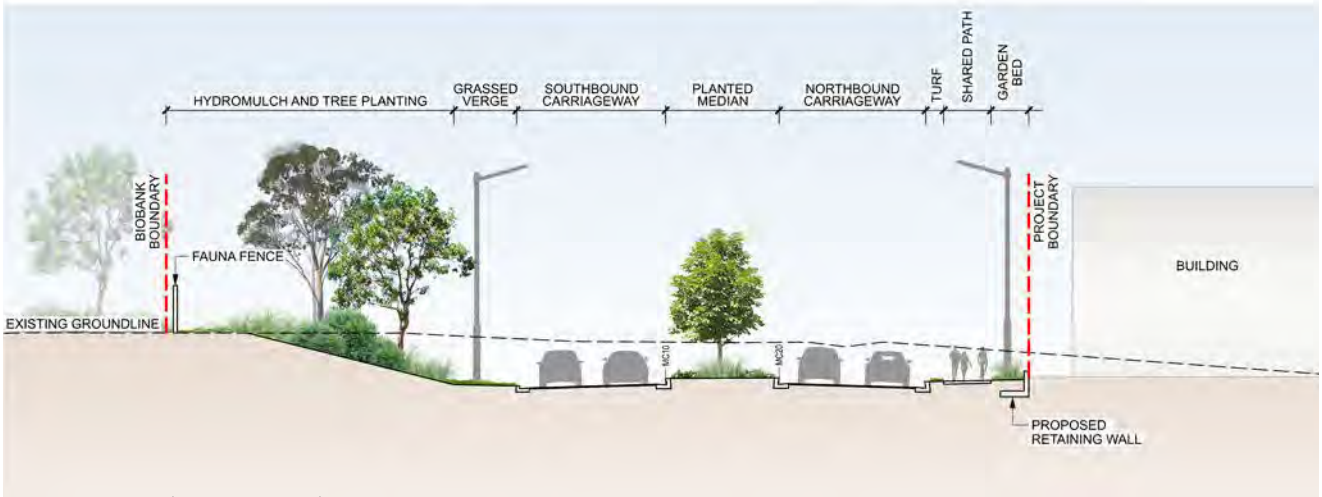


Figure 16. Typical Section B-B at Chainage 1600

5 Urban Design Elements

5.1 Urban Design Overview

The urban and landscape design has been responsive to its context. This reflects the Project's presence within an environment associated with threatened communities and species. It has adopted a natural landscape response that celebrates these communities both within the plantings and in the detailing of the walls. In adopting such an approach, it is responsive to Country through the restoration and protection of the adjoining natural communities of the Cumberland Plain Woodland (refer to Section "7 Landscape Design" on page 48).

The design can be divided into two key elements, which have adopted distinct responses to reflect their differing role within the network:

- The main alignment, which covers the bulk of the alignment and its easement.
- Access roads that reflect the access point provided off the main alignment and connecting to the adjoining facilities.

5.2 The Main Alignment

This covers the main elements of the Project, including the following:

- Median and median islands.
- Public and Active Transport
- Shared path.
- Retaining walls.
- Visual screening fence
- Drainage basins.
- Verges and broader landscape.

These elements of the Project would also be supported by ancillary infrastructure including:

- Stormwater, drainage and flooding infrastructure.
- Utilities relocation and installation.
- Vegetation clearing, remediation, earthworks, signage and landscaping.

5.2.1 Median and Median Islands

Unless otherwise paved, all median islands will be topsoiled and revegetated with low native grasses, groundcovers, and trees within the limitations of 'clear zone' safety requirements. Containerised plant stock is used in these locations, and topsoil depth is increased to facilitate long-term success.

5.2.2 Public and Active Transport

The Project will facilitate the use of public and active transport through the use of a north-south shared user path along most of the alignment. Additionally, the shared used path will facilitate connections to and from the open space network of Moorebank Avenue, including Ernie Smith Reserve and the Anzac Creek shared path. In addition, access will be provided to Glenfield, including Blinman Oval, Trobriand Reserve, Childs Reserve and Lalor Park.

5.2.3 Shared User Path

A 2.5 m wide shared user path for cyclists and pedestrians will be constructed for the length of the alignment. The shared path would initially be along the western side of the northbound carriageway before alternating to the eastern side of the southern carriageway in the vicinity of Intersection D.

A section of the existing shared path at the northern and southern extremities of the alignment would be modified to tie into the new road section. The existing pedestrian crossing north of Intersection A would be maintained if possible. However, minor adjustments and tie-in works may be required.

The road verge would be of varying widths determined by the layout of the new road section. Where the verge incorporates a shared path, it would be approximately 5.5 m wide and at locations that do not include a shared path, the road verge would generally be approximately 3.5 m wide.

The road verge would accommodate utilities, street furniture and barriers.

5.2.4 Retaining walls

Two types of retaining walls are required:

- Wall Type 1 (below the road, retaining walls)
- Wall Type 2 (road-facing retaining walls)

Wall type 1 (below the road, retaining walls)

Wall type 1 is required to support the road and address the adjoining property. The treatment to the face of the wall is proposed to help tie it into the overall setting and reduce its maintenance risk. This is to be achieved through the provision of an uneven surface created using rebates, creating an uneven and irregular surface. A vertical rebated patterning is proposed, which is inspired by the form and character of the floodplain and its sedgeland communities. Figure 17 depicts the interpreted setting and how a stylised form of this may provide a pattern for the wall.

An example of how rebates are used to provide texture, depth and shadow to the walls is depicted in Figure 18. The vertical patterning interpreted from the site would fit within this strategy.

Figure 17. Sedgeland plains of the Georges River; and stylised interpretation of this

Figure 18. Retaining wall Brunswick Heads; and Noise Walls Hunter Expressway

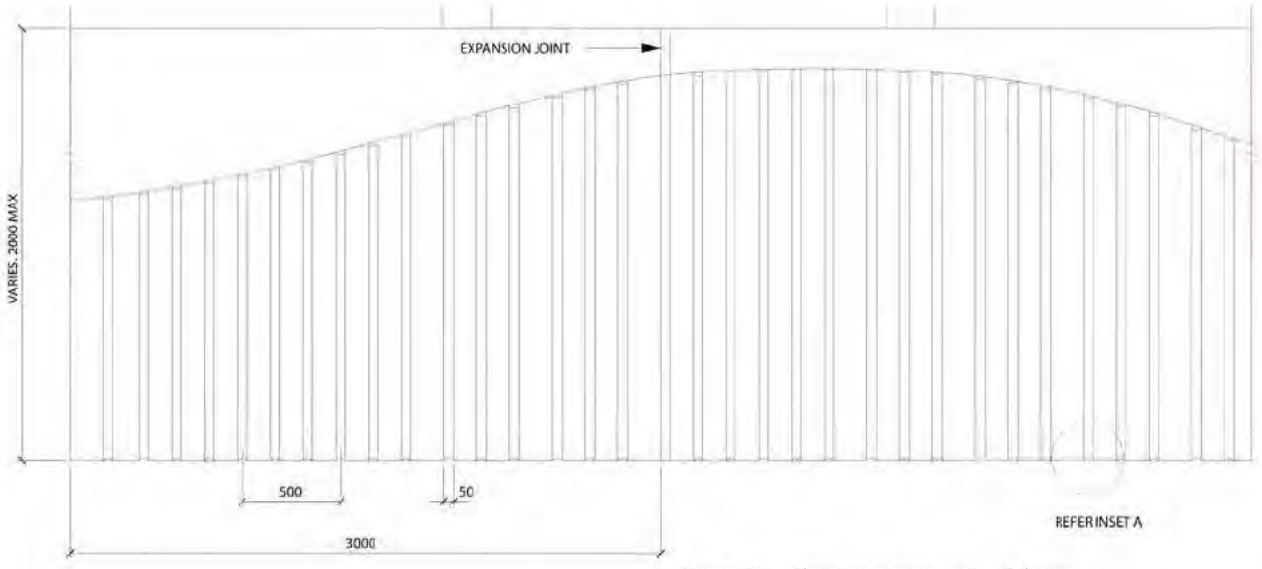


Figure 19. Elevation of proposed wall design

Wall type 2 (road-facing retaining walls)

Wall type 2 (road-facing walls) encompasses walls above the road, retaining the adjoining properties. These walls are typically low and offset 1.0 metres from the path. This zone is proposed to be planted with groundcovers – *Lomandra longifolia* provides separation and context to the wall and minimises its impact on the overall journey.

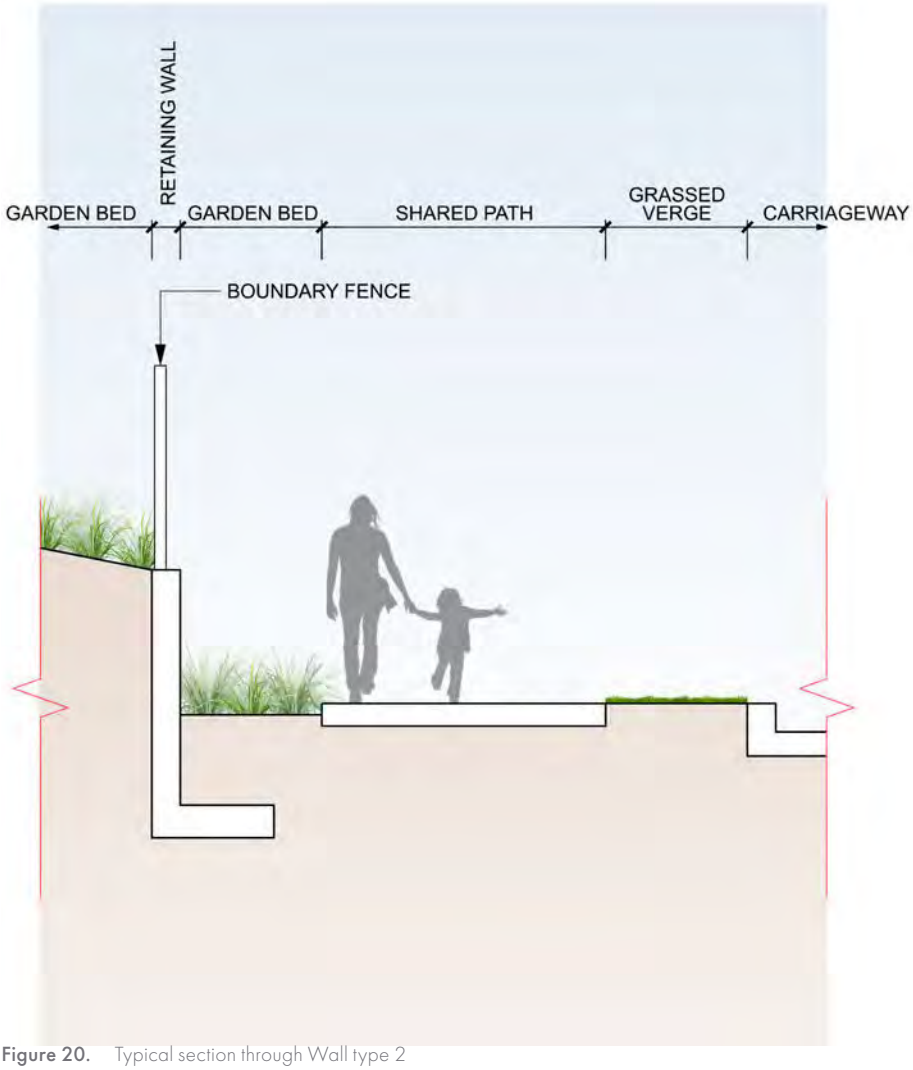


Figure 20. Typical section through Wall type 2

5.2.5 Visual screening fence

A visual screening fence is proposed from approx. Chainage 400 to the Southern DJLU-E boundary at Chainage 1170. The visual screening fence is 2.4 metres high and will be a double-sided Colorbond fence that sits on top of the retaining walls. The visual screen will both address the road and form a backdrop to it in the northern bend. The fence will also visually separate the road from the Defence lands.

5.2.6 Drainage basins

The drainage and landscape plans include Water Sensitive Urban Design (WSUD) measures to meet environmental and sustainability objectives. Drainage design elements include water-quality basins, drainage channels and swales. The landscape design includes the planting of these drainage elements to improve their environmental performance and to increase the diversity of native flora. Refer to Table 4 for list of proposed plant species used for the drainage channels.

The drainage channels for the Project have adopted a plant mix that utilises a bonded fibre matrix (BFM) hydromulch. A BFM has been adopted within environmentally sensitive receiving areas where channel slope and velocity permit. BFM is designed to provide increased performance compared to Standard Hydromulch. This includes longer-term erosion protection by providing complete soil surface cover, improved seed germination and, hence, revegetation outcomes and a greater ability to suppress weeds.

5.2.7 Verges and broader landscape

The road formation changes along the length of the corridor in response to the existing topography, drainage, and vegetation patterns of the landscape through which the Project traverses. The following highlights the different approaches and principles incorporated for the verge treatment (from the back of the kerb to the Project boundary).

- A slashable grass zone within the verge utilising grasses that minimise maintenance inputs and ensure maintenance of sightlines by offsetting large vegetation from the road edge.
- Use of verge turf species in high amenity zones, adjoining paths, etc., which minimise mowing requirements – i.e., low mow varieties of grasses.
- Minimising garden bed zones to areas where a functional requirement is fulfilled, be it screening or increased visual amenity. The design has ensured that the offset of beds meets clear zone requirements to place maintenance crews outside risk zones.
- All cut and fill batters should be softened with vegetation, and wherever possible, grades should be kept to a maximum of 1:3 to allow better visual integration of the road formation with the existing landscape. The cut and fill batters should be rounded off where they interface with the existing landscape.
- Emphasis on the establishment of canopy cover to provide shade and micro-climatic benefits, which minimise the establishment of annual weeds and enhance visual integration and mitigation of the alignment.

5.3 Safety in Design

The design has been undertaken with reference to the Workplace Health and Safety Act 2011 and its associated Regulations and Codes of Practice and SWTC clause 5.2.

The Safety in Design (SiD) process adopted has been based on the NSW WorkCover Safe Design of Structures Code of Practice process (July 2014).

Risks identified throughout the design development phase have been included in a Project SiD register. The risks identified cover the construction, operations & maintenance, and decommissioning phases of the Project.

Included in the SiD Register are the strategies and actions that have been (or will be) taken to avoid or mitigate the risks in accordance with the hierarchy of hazard controls so far as is reasonably practical.

A key element in relation to safety is the review of clear zones and sight distance compliance and landscape interaction. As part of this review consideration will be given to:

- Stopping Sight Distance (SSD)
- Safe Intersection Sight Distance (SISD)
- Approach Sight Distance (ASD)
- Crossing Sight Distance (CSD)

5.4 Constructibility and Construction Methodology

During development of the design, inputs from suppliers and contractors has/is being sought to proof the identified treatments to ensure buildability and viability of the proposed treatments is achieved.

Where applicable, construction methodologies, sequencing and staging is documented within the design drawings. Opportunities to maximise and promote seeded revegetation techniques has been incorporated into the design response to ensure a well vegetated landscape response. Seeding should occur at the earliest opportunity to provide as long as possible establishment time prior to opening and to assist in the management of erosion and sediment control.

6 Cultural Interpretation

6.1 Cultural interpretation

Cultural interpretation aims to make visible the history of the site with traditional knowledge and contemporary storytelling etched into the landscape. The outcome is seamlessly integrating art expressed through materiality and colour choices to convey meaning and reflection of place. The final layer of integration relates the landscaping across the Project providing a rich background on which the built elements are expressed.

The Project has interpreted the landscape based on the knowledge gained through a targeted engagement process with the local Aboriginal community, Aboriginal Land Council, Indigenous Art curators, Liverpool City Council, TfNSW, and key stakeholders.

6.2 Country

> *"Country (with a capital C) has a specific and significant meaning for Aboriginal peoples. In the Aboriginal sense of the word, Country relates to the nation or cultural group and land that we belong to, yearn for, find healing from and will return to. However, Country means much more than land; it is our place of origin in cultural, spiritual and literal terms. It includes not only land but also skies and waters. Country incorporates both the tangible and the intangible, for instance, all the knowledge and cultural practices associated with the land. People are part of Country, and our identity is derived largely in relation to Country"*

— Dr Danièle Hromek, Budawang/Yuin, Researcher and spatial designer (2019, Connecting With Country Draft Framework).

The study area sits on the borders of the Tharawal country (which extended from Botany Bay in the north to Shoalhaven River to the south and east from Campbelltown to the coast), and Darug country (which encompassed Parramatta through to the Blue Mountains and from the Hawkesbury River in the north and Appin in the south).

The study area was frequented by traveling groups and favoured as a place of meeting due in part to its central location and topography.

Ethno-historical accounts indicate that over 30 separate Aboriginal groups (now known as 'clans') populated the wider Sydney Basin in 1788CE (common era), each with their own country, practices, diets, dress and dialects. The many rivers acted as a natural demarcation of the areas and the flat terrain of the Cumberland Plain was favourable to the livelihood of these groups. Evidence suggests that population densities of Aboriginal peoples pre contact was high.

6.3 Emerging ideas and concepts reflecting the place

The landscape design aims to respond to the characteristics of Western Sydney as a locale and reflect the biodiversity of the Cumberland Plain.

The adjoining creek corridors and vegetation communities along the Project will provide ideas and opportunities. The design would also bring balance to the natural environment by sourcing seeds from the region to vegetate the project footprint and propagate local, native and suitable plant life.

6.4 Interpretation elements

The Project has presented the opportunity to work with local Aboriginal communities, discover the inherent associative cultural values and explore how these relate to the identity of the place.

The following typology has been adopted:

- Integrated cultural plantings and bush gardens: a holistic approach to planting has been adopted across the Project and draws upon and celebrates the native vegetation communities.

Refer to Section 7 "Landscape Design" on page 48.

7 Landscape Design

7.1 Landscape design intent

The landscape design response for this Project has been largely to encapsulate the corridor within the natural communities or a landscape that is responsive to these. Tree removal has been minimised where possible, to help maintain the original landscape character along the corridor, with new landscape works to rehabilitate the disturbed areas nearby. Two key vegetation communities have been identified as dominant within the alignment and reflect an abstraction of the natural community mosaic; these are:

11. Castlereagh Scribbly Gum Woodland: this occurs at the southern end of the corridor commencing just north of the Anzac Creek. The community comprises *Eucalyptus parramattensis* (Parramatta Red Gum), *Eucalyptus sclerophylla* (Hard-leaved Scribbly Gum), and *Angophora bakeri* (Narrow-leaved Apple) as the dominant canopy species.
12. Castlereagh Ironbark Forest: this has been identified as covering the area from just north of Anzac Creek to the northern limits of the Project. Its canopy is dominated by *Angophora bakeri* (Narrow-leaved Apple), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus fibrosa* (Red Ironbark), *Eucalyptus longifolia* (Woollybutt), and *Allocasuarina littoralis* (Black She-Oak).

7.2 Planting typologies

The distribution of planting within these associations reflects a natural understorey of shrubs and groundcovers. The process of implementation is proposed to comprise:

1. Broadscale seeding of shrubs and groundcovers – this adopts a hydromulch treatment to enable the cost-effective establishment of the adjoining vegetation community
2. Broadscale planting - comprising tube stock planting of trees throughout the seeded area to address fire and safety (clear zone) requirements of the road corridor.
3. Garden bed planting – includes grasses and groundcovers, as well as shrubs and tree planting where space permits. It is broken down into the following:
    - Median planting: this comprises of an understorey of grasses – *Lomandra longifolia* and *Lomandra tanika* providing an open character and a sense of separation between the two travel lanes; and a canopy of frangible trees - *Tristaniopsis laurina*. This small tree provides a dense canopy, instilling a strong lineal character and definition to the road corridor.
    - Verge Planting: these garden beds address walls within the landscape and the need to screen or mitigate the views of this element. Planting is comprised of hardy native groundcovers and shrubs (where space permits). Shrubs are typically 1-1.5m in height.

Table 4. Plant Schedule

Botanical Name	Common Name
Trees	
Broadscale Trees	
Angophora bakerii	Narrow leaved Apple
Eucalyptus crebra	Narrowed leaved Ironbark
Eucalyptus fibrosa	Red Ironbark
Eucalyptus longifolia	Woollybutt
Eucalyptus parramattensis	Parramatta Red Gum
Eucalyptus sclerophylla	Hardy-leaved Scribbly Gum
Median Trees	
Tristaniopsis laurina	Water Gum
Feature Trees	
Corymbia maculata	Spotted Gum
Shrubs	
Drainage Invert	
Carex appressa	Tall Sedge
Ficinia nodosa	Knobby Club-rush
Juncus usitatus	Common Rush
Median	
Lomandra longifolia	Spiny-head Mat-rush
Lomandra 'Tanika'	Mat-rush
Myoporum parvifolium	Creeping Boobialla
Noise wall / Type 1 Retaining Wall	
Callistemon viminalis	Callistemon ' Capitain Cook'
Lomandra longifolia	Spiny-head Mat-rush
Sannantha virgata	Baeckea
Type 2 Retaining Wall	
Lomandra longifolia	Spiny-head Mat-rush
Turf	
Zoysia japonica	Empire Zoysia

Botanical Name	Common Name
Seed mix 1: Castlereagh Scribbly Gum Woodland	
Native Grasses	
Microlaena stipoides	Weeping Grass
Themeda australis	Wallaby Grass
Dianella caerulea	Blue flax-lily
Goodenia bellidifolia	Daisy Goodenia
Native shrubs and groundcovers	
Banksia spinulosa	Hairpin Banksia
Bursaria spinosa	Native Blackthorn
Daviesia ulicifolia	Gorse Bitter Pea
Hakea dactyloides	Finger Hakea
Hakea sericea	Silky Hakea
Kunzea capitata	Kunzea
Leptospermum trinervium	Flaky barked Tea-tree
Melaleuca nodosa	Prickly leaved Paperbark

Botanical Name	Common Name
Seed mix 2: Castlereagh Ironbark Forest	
Native Grasses	
Dianella caerulea	Blue flax-lily
Dichondra repens	Kidney weed
Entolasia stricta	Wiry Panic
Goodenia hederacea	Ivy Goodenia
Lepidosperma cf. laterale	Variable Swordsedge
Lomandra longifolia	Spiny-head Mat-rush
Lomandra multiflora	Many flowered Mat-rush
Microlaena stipoides	Weeping Grass
Panicum simile	Two colour panic
Themeda triandra	Kangaroo Grass
Native trees, shrubs and groundcovers	
Acacia falcata	Sickle Wattle
Baeckea diosmifolia	Fringed Baeckea
Breynia oblongifolia	Coffee Bush
Bursaria spinosa	Native Blackthorn
Dillwynia retorta	Eggs and Bacon
Hakea sericea	Sily Hakea
Melaleuca decora	White feather Honeymyrtle
Melaleuca nodosa	Prickly leaved Paperbark
Persoonia linearis	Narrow leaved Geebung
Pultanaea villosa	Hairy Bush Pea
Lissanthe strigosa	Peach Heath
Daviesia ulicifolia	Gorse Bitter Pea

Seed mix 3: Channels	
Native Grasses	
Carex appressa	Tall Sedge
Ficinia nodosa	Knobby Club-rush
Gahnia sieberana	Red-fruit Sawsedge
Hardenbergia violacea	Native Sarsparilla
Juncus usitatus	Common Rush

7.3 Tree Removal and Replacement Planting

Urban Arbor conducted an arborist assessment in November 2023 (refer to Appendix B). The assessment identified the total number, type, and location of trees removed.

As indicated in Table 5, 164 trees will be removed, and 847 new trees will be planted for the Project. Thus, the total net increase in tree planting for the Project is 683.

Table 5. Tree removal and replacement planting summary

Tree Type	Pot size	Total
Existing trees removed	-	**164**
New trees		
Broadscale Trees	Tubestock	534
Median Trees	45 Litre	283
Feature Trees	45 Litre	30
		847
	Net increase in total trees	**683**

7.4 Planting Guidelines

7.4.1 Container size, plant height and densities

All plants for the Project should be supplied in containers and be grown to the approved heights as specified in Table 6.

It will be important to achieve a well vegetated and dense planting coverage and avoid weed infestation. Refer to Table 6 for planting densities.

Table 6. Container size, plant heights and densities

Plant size	Container size	Approved plant height	Density
Tubestock / forestry-tube	45-50mm x 90-120mm deep	200-300mm	6-8 per m²
Semi-advanced	150mm dia. x 120mm deep	300-400mm	1-4 per m²
Advanced	200mm dia. x 200mm deep	300-500mm	As needed
Super advanced	20L - 45L	1200-1500mm	As needed

7.5 Cover crop and native seed application

In general, a coverage rate of 10 kilograms per hectare should be used for native seed works for the Project. This is supplemented with the cover crop species listed in Table 7 as specified by Roads and Maritime specification R178.

Table 7. Cover crop and native seed application rates

Species	Rate (kg /hectare)
Japanese Millet (Sep-Mar) or	@35 kg/ha
Rye Corn (Apr-Aug)	@35 kg/ha
Annual or short term rye	@25 kg/ha
Couch	@7 kg/ha
Red Clover	@5 kg/ha
Native Seeds	@10 kg/ha
Organic Fertiliser	@250 kg/ha

7.6 Bushfire Management

Compliance with the bush fire management objectives is achieved through the approach to the typical cross-sections indicated in Figure 15 and Figure 16, which provides a wide grass verge (reflecting the construction of a formation capable of addressing the future widening of the alignment), central median planting, which has adopted less combustible and frangible plant form – *Tristaniopsis laurina* (Water Gum), with a simple and robust underplanting of Lomandra spp.; and a formalised entry avenue of trees in the grass at key access road intersections, which have adopted a smooth bark gum tree *Corymbia maculata* to address fire concerns.

Surface drainage in the form of swales and linear basins also plays a role in reducing the fire risk. These elements adopt a grassland/sedgeland treatment, which combines with the presence of water within the basin to provide an additional buffer between the adjoining bushland and the development west of the road alignment.

In addition, the broader landscape canopy treatment has sought to cluster trees so that they do not form a continuous and touching canopy but rather isolated clumps of planting.

8 Monitoring and Maintenance

8.1 Landscape establishment and maintenance

The following identifies landscape maintenance activities required to be undertaken for landscape areas on the Project until the handover of the Project.

Maintenance of all landscaped and revegetated works shall be carried out in accordance with TfNSW Specification R178 'Vegetation' and R179 'Landscape Planting'. The specification covers standards and methods for all the normal tasks required for landscape and horticultural maintenance.

8.2 Monitoring and maintenance procedures for the design elements

Prior to the commencement of operation, an Operations and Maintenance (O&M) Manual will be developed for the Project, which provides detailed procedures for the monitoring and maintenance of built elements.

Monitoring and maintenance requirements have been summarised in Table 5, including tasks required, time frames and frequency of activity.

Table 8. Summary of landscape maintenance requirements

Maintenance actions	Tasks	Time Frames / Frequency				
		Weekly	Monthly	Seasonal	As required	As specified below
Retaining walls and noise walls						
Detailed Inspections	Detailed inspection involving visual inspection, photographic documentation and reporting on the condition of major elements including measurements of defects, e.g. cracks, settlement.					Every 2 years
Graffiti	Inspect walls for graffiti and remove as soon as possible.					Every 2 years
Fences						
Inspections	Inspect all posts, fence panels and fixings for signs of damage, discolouration, tension, rust; if damage is identified, maintain and/or replace to ensure Defence property is not accessible.					3 monthly
All areas						
Pruning of vegetation for safety	Maintaining driver sightlines.					
	Pruning trees over carriageways, roads, paths and cycleways.					
Management of non-frangible vegetation	Remove woody "non-frangible" vegetation in setbacks.					Once per year
Noxious weed control	Treat noxious weeds according to control category.					
Rubbish removal	Remove all roadside litter and debris.					
Mowing of verge areas	Maintain a 2m wide mown strip to edge of all surfaces					When growth exceeds 100mm high
	Mow grass to a maximum height of 50mm.					
Auditing and reporting	Audit and report on maintenance works					

Maintenance actions	Tasks	Time Frames / Frequency				
		Weekly	Monthly	Seasonal	As required	As specified below
Mulched massed planting areas						
Watering	Water planting areas as required to germinate seed and maintain healthy growth. Ensure that a distinct level of moisture in the soil is maintained at all times and that plants do not dry out during this period. The frequency of watering may be varied during periods of adequate rainfall.					
	- First 8 weeks after planting - 20 litres per plant	■				
	- Thereafter to 26 weeks after planting - 10 litres per plant					14 day intervals
Weeding	Weed planting areas (manual or herbicide) before weed seed set.		■			
Mulching	Reapply mulch to maintain a depth of 100mm.				■	
Removal of dead/ dying plant material	Remove dead or dying plant material and replace.				■	
Replacement plantings	Replace failed plantings with specified species and densities.				■	
	Water replacement plantings as listed under 'Watering'.					As listed in 'Watering'
Tree guards and stakes	Replace damaged tree guards and stakes during establishment.				■	
	Remove tree guards and stakes.					12 months after planting establishment
Horticultural maintenance	Fertilise all planting at specified rates					
	Prune all planting as specified:					
	- Canopy trees				■	
	- Shrubs				■	
	- Grasses and Groundcovers				■	
	- Climbers				■	
Turf areas						
Watering	Water the turf immediately after laying until the underlay is moistened to its full depth. Continue watering every second day for the first fourteen (14) days, then at regular intervals until the turf is established.					Daily
	Watering of turf once it is established.				■	
Mowing	Mow grass to a maximum height of 50mm.					When growth exceeds 75mm
Replace damaged turf	Remove damaged areas of turf and replace with new turf.				■	
Weed control	Control weeds in turf areas using selective herbicide.		■			

9 Review of Landscape Character and Visual Impact Assessment

9.1 Scope

The following summarisies the Landscape Character and Visual Impact Assessment (LCVIA) prepared as part of the EIS (Appendix L) and identifies where it is considered that the design impacts or assessment differ from that identified within the initial assessment.

9.2 Review of Landscape Character Assessment

The landscape character assessment has identified four landscape character zones, as shown in Figure 21:

- LCZ 1 - Moorebank Industrial Area - encompassing the site and adjoining land uses along Moorebank Avenue, which are characterised by large format warehousing and industrial buildings
- LCZ 2 - Surrounding Residential Suburbs - addresses the residential communities to the east and west of the facility comprising low to medium-density residential development.
- LCZ 3 - Fragmented Vegetation - identifies the remnant vegetation along the upper banks and floodplain of the Georges River and retains it as part of the Holsworthy Defence Lands.
- LCZ 4 - Riparian Zone - refers to the immediate margins of the Georges River and its vegetation. The vegetation community is influenced by the high moisture levels associated with the river.

While the findings of Landscape Character Zones are generally accepted, the result for LCZ 2 – Residential precinct is considered higher than would be the result. The current rating has an assessment of moderate sensitivity and moderate magnitude. All residential precincts are removed from the development site, and the MPE impacts are assessed independently of the road corridor. The scale and proximity of the MPE between the residential communities to the west and the road provide a buffer to the corridor, so no change would result in character as there is no immediate interface. The impacts that are experienced are potentially visual, but this is an assessment of character. The impact of the magnitude of change cannot be considered moderate, so it has been adjusted to negligible magnitude, reflecting that the zone is removed from any physical connection to the site. This results in a negligible impact on character.

As a result of this revision, there is one LCZ - LCZ 3, which has a high to moderate impact. This is the vegetation community immediately adjoining the corridor. The project directly impacts it, and so, in part, experiences a loss in area and will consequently be impacted by change. It has been assessed as moderate to high impact, and, as such, efforts will need to be made to fully integrate this within the corridor while protecting biodiversity and the developing community. This has been achieved through the landscape design response for this Project as outline in Section 7.1. The intent is to encapsulate the corridor with a landscape that is responsive to the existing plant communities.

Table 9. Updated Landscape Character Assessment

Landscape Character Zone	Sensitivity	Magnitude	Impact
LCZ 1 Moorebank Industrial Area	LOW	LOW	LOW
LCZ 2 Surrounding Residential Suburbs	MODERATE	NEGLIGIBLE	NEGLIGIBLE
LCZ 3 Fragmented Vegetation	HIGH	MODERATE	HIGH-MODERATE
LCZ 4 Riparian Zone	MODERATE	NEGLIGIBLE	NEGLIGIBLE

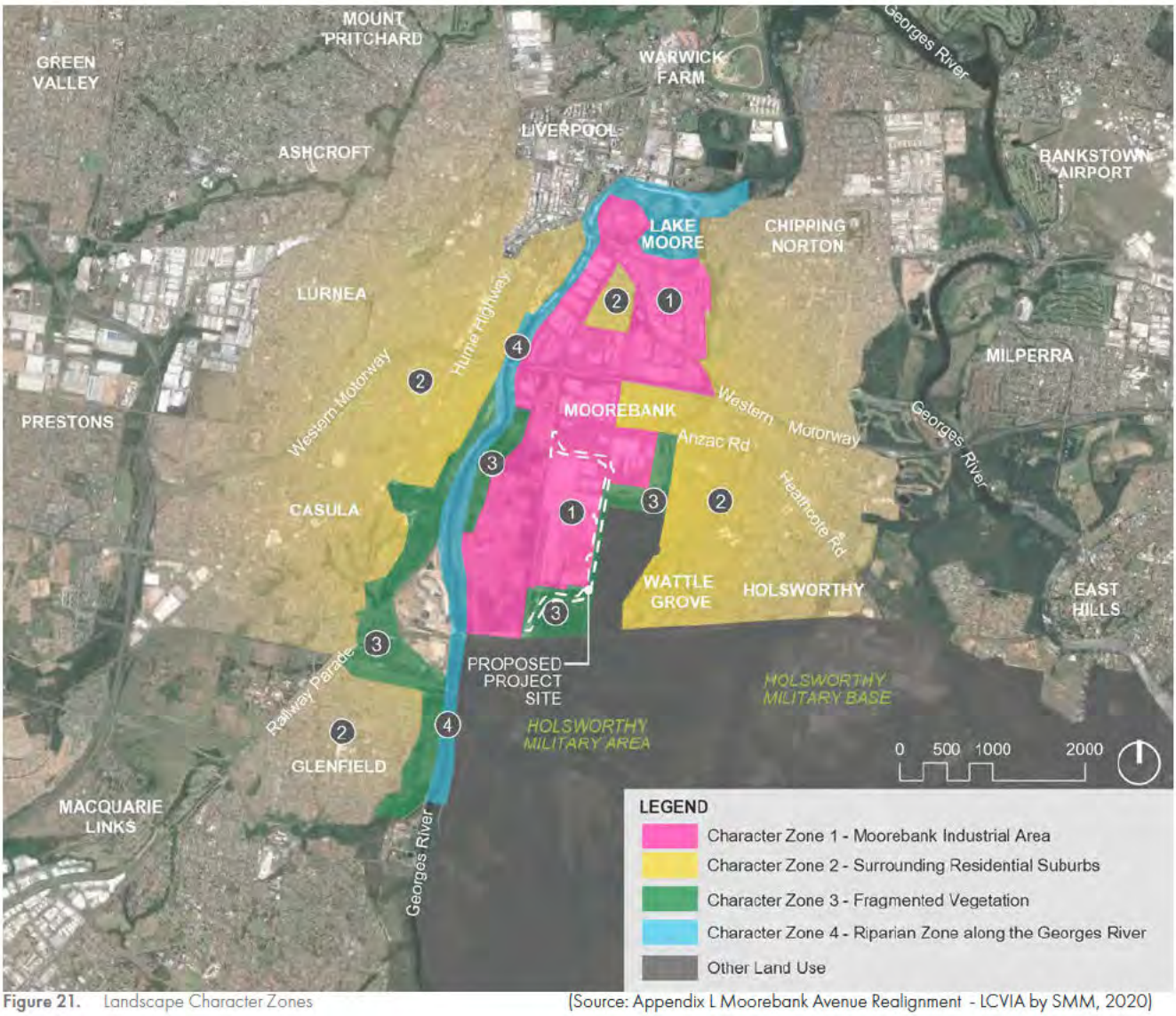


Figure 21. Landscape Character Zones (Source: Appendix L Moorebank Avenue Realignment - LCVIA by SMM, 2020)

9.3 Review of Visual Impact Assessment

Generally, the findings of most viewpoints are acceptable within the immediate environs of the corridor. However, the viewpoints beyond are overestimated due to the construction of the Moorebank Precinct East (MPE) since the time the EIS was written. The following outlines the assessment change:

- **Viewpoint 2** - Banyule Circuit, Wattle Grove, looking west towards the MPE. -While it is accepted that the sensitivity of this residential precinct is moderate, the magnitude of change is negligible. The screening present restricts views of the built form of the warehouses. The road is of a significantly smaller scale and, so too, would be restricted by vegetation, resulting in a negligible change in view.
- **Viewpoint 9** - Leacock Regional Park including Glenfield Farm, looking east towards the MPE and MPW - While it is accepted that the sensitivity of this residential precinct is moderate, the magnitude of change is negligible. The presence of MPE between the viewpoint and Moorebank Avenue and the limited elevated nature of the corridor will mean the road alignment is not visible from this viewpoint.
- **Viewpoint 10** - Casula Parklands, looking southeast towards the Georges River and MPE. The sensitivity as assessed is low given the nature of the setting and its removal from site, the magnitude however is negligible as the only visual link is light spill which would not add noticeably to that of the adjoining facilities. The assessment is therefore considered to be negligible.

Table 10. Updated Visual Impact Assessment

Viewpoint No.	Sensitivity	Magnitude	Impact
VPT 1	LOW	LOW	LOW
VPT 2	MODERATE	NEGLIGIBLE	NEGLIGIBLE
VPT 3	MODERATE	NEGLIGIBLE	NEGLIGIBLE
VPT 4	LOW	LOW	LOW
VPT 5	LOW	LOW	LOW
VPT 6	LOW	LOW	LOW
VPT 7	MODERATE	MODERATE	MODERATE
VPT 8	LOW	LOW	LOW
VPT 9	MODERATE	NEGLIGIBLE	NEGLIGIBLE
VPT 10	LOW	NEGLIGIBLE	NEGLIGIBLE
VPT 11	MODERATE	LOW	MODERATE-LOW

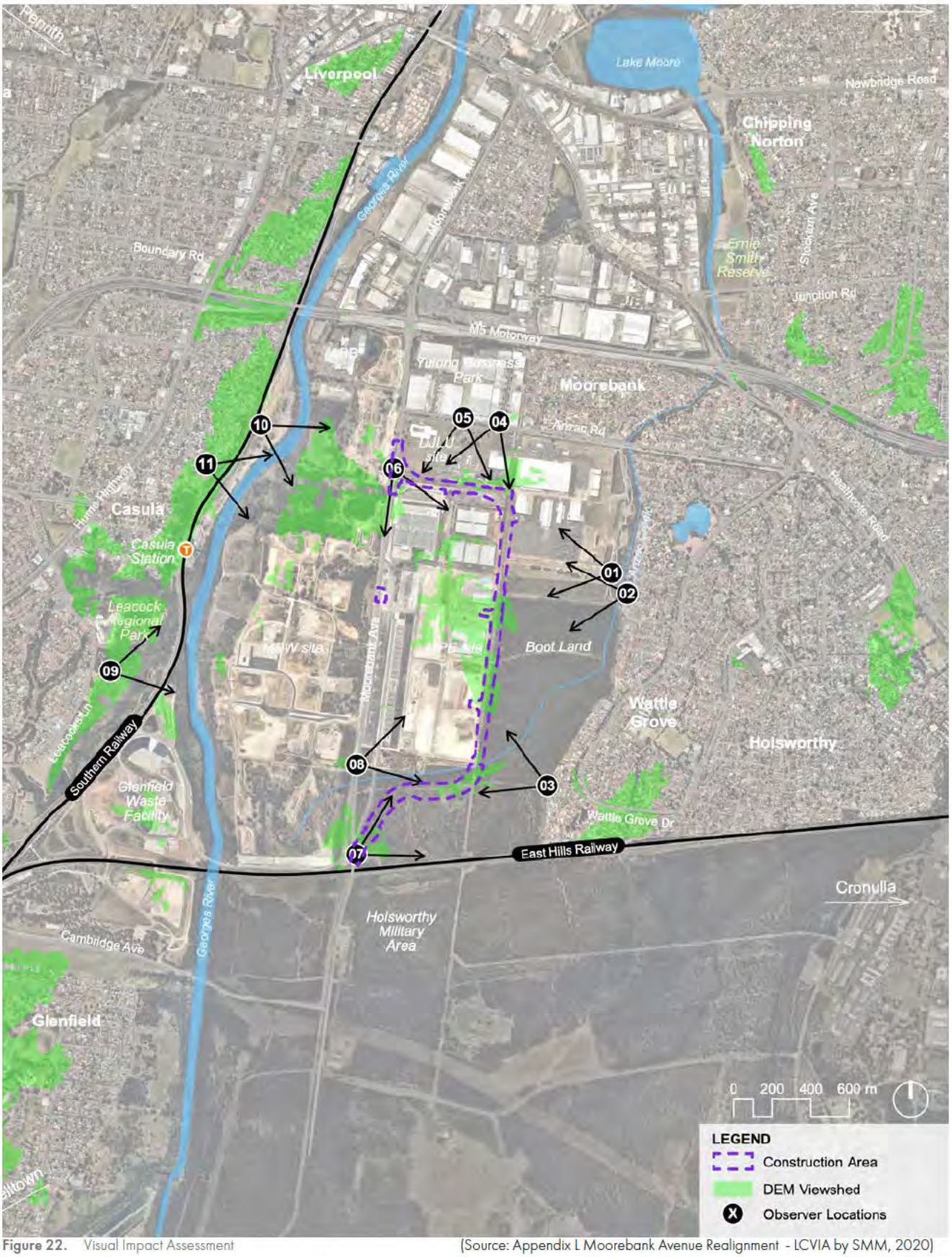


Figure 22. Visual Impact Assessment (Source: Appendix L Moorebank Avenue Realignment - LCVIA by SMM, 2020)

9.4 Landscape Character and Visual Impact Mitigation Strategies

The LCVIA identified a range of measures to prevent, avoid and reduce landscape character and visual impacts of the Project, providing, where possible, offsets or remedies to maintain the amenity and values of Moorebank and the surrounding area. The mitigation measure included:

Project Design

- Locate ancillary sites where they would have least visual impact.

Structures

- Detailed design of structural elements, including noise barriers, retaining walls and retaining wall finishes, would be in accordance with Beyond the Pavement, urban design policy, procedure and design principles (TfNSW, 2023) and the associated design guidelines.
- Consider the design of the new retaining walls in order to minimise the apparent height of the walls, including planting to the base of the wall and terracing.
- New retaining walls would be designed to have a finish that relates to the character of the surrounding landscape.

Drainage

- Where there is sufficient space, operational water quality devices would be designed with consideration of reducing visual impacts and Project footprint.

Lighting

- The design of temporary and permanent lighting would be undertaken in accordance with AS/NZS 1158.1.1:2022 and would avoid unnecessary light spill on adjacent residents or sensitive receivers.

Landscape Implementation

- Minimise the removal of existing vegetation within the road corridor.
- Consider the potential for planting of shrub species in medians and verges in detailed design, where the width of the median allows, taking into account clear zone requirements for headlight glare screening.
- Provide screen planting to proposed retaining walls to screen the Project from sensitive adjacent land uses where applicable.
- Replacement and enhancement of vegetative screening along the project corridor must be undertaken in a progressive manner during construction to allow for its early establishment.
- Promote biodiversity by propagating and planting locally collected seeds (trees , shrubs and groundcovers) from the impacted native vegetation communities.

10 Conclusion

10.1 Mitigation Measures

This assessment should result in further design consideration that aims to eliminate or minimise adverse impacts through careful planning and design of the project. This ensures that mitigation becomes incorporated into the realised Project outcome.

The ongoing design development process needs to refine and develop design detailing to achieve a high-quality outcome that improves the project's built natural and community environment, which is befitting of the project location within western Sydney and MIP.

Key mitigation measures will be employed during detailed design development in the future stages of this project. The design has responded to the following revised management and mitigation measures outlined in Table 2 on page 13.

10.2 Conclusion

This UDLP has considered the existing landscape character, detailed the urban design aspects of the Project, and assessed changes to LCZ's and visual impact assessment.

The report outlined strategic urban design objectives that would form the basis of design and evaluation from concept design through to construction, including several principles and objectives developed to help guide the decision-making process, provide a platform for engaging with stakeholders, and inform the physical designs proposed.

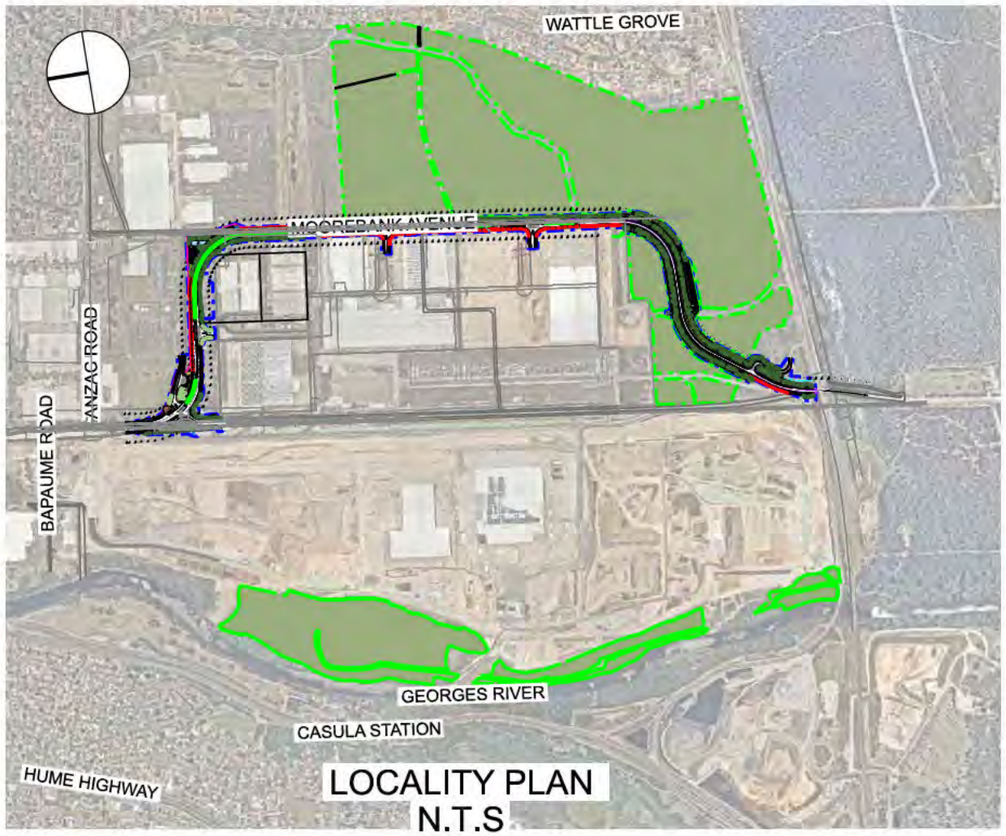
The urban design concept identified a series of proposals that have been implemented and integrated with the civil engineering works, based on the urban design principles and objectives, creating a project identity, and drawing upon its unique relationship with the vegetation communities of the Cumberland Plain Woodland.

Several mitigation and management measures have been recommended to reduce the landscape character and visual impacts of the project. These measures generally consist of utilising locally endemic planting to screen and provide some visual continuity with the surrounding landscape. Retention of as much existing remnant vegetation as possible would help to reduce visual impacts.

Appendices

Appendix A Landscape Design Plans

MOOREBANK AVENUE REALIGNMENT WORKS (MARW)
LANDSCAPE DESIGN



LOCALITY PLAN
N.T.S

Issue	Description	Date
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2021
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status

Scales	1:1000	Current Issue Signatures	
		Drawn MG	
Original Size	A3	Designed MN	
Height Datum	AHD	Checked ME	
Grid	MGA94 - 56	Approved DKI	
Filename:	MARW-TRA-LA-DD-DWG-0001.Dgn		

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: TITLESHEET
SHEET 1 OF 2
LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0001

Issue C

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0001.Dgn

GENERAL

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH RELEVANT SPECIFICATIONS AND ENGINEERING REQUIREMENTS INDICATED ON PLAN.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH, BUT NOT LIMITED TO DRAWINGS FROM THE FOLLOWING RELEVANT DESIGN DISCIPLINES: BRIDGES, GEOTECHNICAL, MISCELLANEOUS STRUCTURES, RETAINING WALLS, GEOMETRY, ALIGNMENT AND EARTHWORKS, DRAINAGE DESIGN, PAVEMENT DESIGN, FENCING, UTILITIES
3. ALL VEGETATION OUTSIDE OF THE PROJECT CONSTRUCTION CLEARING AREA AND IDENTIFIED IN SPECIFICATIONS AND DRAWINGS IS TO BE PROTECTED AND RETAINED IN ACCORDANCE WITH CLAUSE 3.3 OF TFNSW SPECIFICATION D&C R179 ' LANDSCAPE PLANTING'
4. THE CONTRACTOR WILL ENSURE THAT PROPOSED LANDSCAPE TREATMENTS ALLOW ACCESS TO FINAL LOCATIONS OF ALL SERVICES INCLUDING MANHOLES, VALVES, FIRE HYDRANTS, SWITCHBOARDS, FIELD CABINETS AND ALL OTHER RELEVANT SERVICES.
5. IMPORTED TOPSOIL SHALL COMPLY WITH THE REQUIREMENTS SET OUT UNDER CLAUSE 2.13 OF TFNSW SPECIFICATION D&C R178 IMPORTED TOPSOIL.
6. ANY AREA NOT SHOWN AS REVEGETATION ON THE LANDSCAPE PLANS WHICH IS DISTURBED DURING PROJECT CONSTRUCTION IS TO BE REINSTATED WITH THE REVEGETATION MIXES. REFER TO PLANT SCHEDULES AND REINSTATEMENT DETAILS.

SITE CLEARING

1. PROTECT FROM DAMAGE ALL EXISTING TREES, FENCES, BUILDINGS, OTHER STRUCTURES AND SITE FURNITURE IN ACCORDANCE WITH THE QA SPECIFICATION G40 SITE CLEARING.
2. ALL VEGETATION OUTSIDE OF THE PROJECT CONSTRUCTION CLEARING AREA AND DRAWINGS IS TO BE PROTECTED AND RETAINED IN ACCORDANCE WITH CLAUSE 3.3 OF TFNSW SPECIFICATION D&C R179 'LANDSCAPE PLANTING'
3. TREE PROTECTION SHOULD BE BASED ON ASSESSMENT OF TPZ AND EXTENT OF INCURSION AS DETAILED IN LA - DRG - 0201
4. ENSURE SOIL TESTING OF TOP SOILS AND SUBSOILS IS UNDERTAKEN AND AMELIORATION UNDERTAKEN IN ACCORDANCE WITH SOIL SCIENTIST'S RECOMMENDATIONS AS DEFINED IN R178 AND R179

UTILITIES

1. LOCATE AND PROTECT ALL UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION. MAKE GOOD ALL DAMAGE TO EXISTING WORKS CAUSED BY THE ACTIVITY OF THESE WORKS.
2. GENERALLY TREES AND SHRUBS GREATER THAN 5.0M IN HEIGHT MUST NOT BE PLANTED OR SEEDED WITHIN A MINIMUM OF 5.0M OF OVERHEAD POWER LINES FOR 66KV AND 11KV LINES AN EASEMENT OFFSET OF 15M OR 10M RESPECTIVELY IS REQUIRED EITHER SIDE OF THIS. CONFIRMATION IN WRITING, AS TO OFFSETS, SHOULD BE GAINED FROM AUTHORITY PRIOR TO INSTALLATION.
3. THE CONTRACTOR WILL ENSURE THAT PROPOSED LANDSCAPE TREATMENTS ALLOW ACCESS TO FINAL LOCATIONS OF ALL SERVICES INCLUDING MANHOLES, VALVES FIRE HYDRANTS, SWITCHBOARDS, FIELD CABINETS AND ALL OTHER RELEVANT SERVICES

DRAINAGE

1. DRAINAGE CHANNELS HAVE BEEN DEFINED AS VEGETATED (ORGANIC FIBRE MESH LINED) OR ROCK OR CONCRETE CHANNELS. THESE ARE INDICATED DIAGRAMMATICALLY ON PLANS.
2. FOR VEGETATIVE TREATMENTS TO DRAINAGE LINES, REFER TO DRAINAGE PACKAGE SM-01 FOR GEOMETRY AND SETOUT, AND LANDSCAPE DRAWINGS FOR SOIL PREPARATION AND SEEDING /PLANTING TREATMENTS.
3. FOR ROCK OR CONCRETE TREATMENTS, REFER TO DRAINAGE PACKAGE SM-01 FOR GEOMETRY AND SETOUT

LANDSCAPE REQUIREMENTS

1. ALL LANDSCAPE RE-VEGETATION AND PLANTING WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH PLANS AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE TFNSW SPECIFICATION R178 AND R179.
2. THE EXTENT OF WORKS SHOWN ON LANDSCAPE PLANS IS INDICATIVE ONLY BASED ON ENGINEERING DESIGN AND CLEARING EXTENTS. ALL DISTURBED AREAS ARE TO BE RE-VEGETATED IN ACCORDANCE WITH THE DOCUMENTATION AND WHERE GREATER THAN INDICATED ARE TO USE THE RELEVANT NATIVE COMMUNITY AS RELEVANT. PASTURE GRASSES ARE NOT TO BE USED.
3. PLANTING AND SEEDING MIX REQUIREMENTS ARE SHOWN IN RELEVANT SCHEDULES ON DRAWING MARW-TRA-LA-DD-DWG-0122
4. TREES ARE TO BE PLANTED OR SEEDED ONLY WHERE THEY ARE BEYOND CLEARANCES PER AUSTROADS GUIDELINES OR DEFLECTION ZONES OF BARRIERS. A MINIMUM OFFSET OF 3M FOR TREE PLANTING IS TO BE ADOPTED FROM THE REAR OF ALL BARRIERS INCLUDING GUARD RAILS AND WRSB
5. TREES SHOW AS 0 ON PLANTING SCHEDULE ARE OPTIONAL SPECIES IN CASE THE NOMINATED ARE UNABLE TO BE PROCURED.
6. HYDROMULCH ALONG BOUNDARY / FENCING IS ONLY TO BE UNDERTAKEN IN LOCATIONS WHERE EXISTING VEGETATION IS CLEARED AND SOIL EXPOSED. A MINIMUM WIDTH OF 3M IS TO BE PROVIDED. HYDROMULCH MAY BE SUBSTITUTED WITH 100MM SITE MULCH LAYER WHERE ADJOINING VEGETATION IS RETAINED.

SITE PREPARATION

1. HERBICIDE APPLICATION FOR TREATMENT OF WEEDS WITHIN 10M OF WATERWAYS WILL BE CARRIED OUT WITH LOW TOXICITY HERBICIDES THAT WILL HAVE A LOW IMPACT ON THE ENVIRONMENT. SELECTED HERBICIDE FOR THESE AREAS SHALL COMPLY WITH THE REQUIREMENTS OF G36 ENVIRONMENTAL PROTECTION AND WILL BE PROVIDED BY THE PROJECTS ENVIRONMENTAL OFFICER PRIOR TO ITS APPLICATION

SPECIFICATIONS

1. TFNSW SPECIFICATIONS R178 AND R179 ARE APPLICABLE.

PLANTING NOTES

1. PREPARE PLANTING HOLES IN ACCORDANCE WITH THE PLANTING HOLE DIMENSION SETOUT IN CLAUSE 3.6.1 OF TFNSW SPECIFICATION QA R179 'LANDSCAPE PLANTING'
2. AT THE BOTTOM OF EACH PLANTING HOLE, INCORPORATE A SOIL CONDITIONER AND FERTILISER AND MIX WITH THE TOPSOIL. REFER TO CLAUSE 2.5 OF TFNSW SPECIFICATION QA R79 'LANDSCAPE PLANTING' FOR SOIL CONDITIONER REQUIREMENTS AND TO TABLE 1 FOR FERTILISERS.
4. UNIFORMLY AND LIGHTLY COMPACT THE BACKFILLING AROUND EACH PLANT AND FINISH FLUSH WITH THE NATURAL SURFACE LEVEL.
5. WATER EACH PLANT IMMEDIATELY AFTER THE PLANTING OPERATION IS COMPLETE, THEREAFTER AT THE REGULAR INTERVALS AND THE QUANTITY OF WATER SET OUT UNDER CLAUSE 3.6.4 OF TFNSW SPECIFICATION QA R179 'LANDSCAPE PLANTING'
6. FOR MASS PLANTING AREAS, PLANTS TO BE SET OUT IN A STAGGERED ARRANGEMENT.
7. STAKING AND TYING OF CONTAINER STOCK SHALL BE IN ACCORDANCE WITH CLAUSE 2.4 OF TFNSW SPECIFICATION QA R179 'LANDSCAPE PLANTING'.
8. ALL HYDRO APPLICATIONS SHALL BE UNDERTAKEN AS PER THE TYPICAL DETAILS IN THIS PACKAGE AND AS LISTED WITHIN QA R178 R179.
9. TREES PLANTED WITHIN MEDIAN ARE TO BE CR

MAINTENANCE

1. WHERE GRASSES ARE PLANTED AROUND BRIDGE PIERS, SPECIES HAVE BEEN SELECTED TO PROVIDE A SUITABLE HEIGHT TO ASSIST IN SCOUR PREVENTION. GRASSES TO BE MAINTAINED AT A MINIMUM HEIGHT OF 0.5M

Issue	Description	Date
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2022
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status

Scales: 1:1000

Original Size: A3

Height Datum: AHD

Grid: MGA94 - 56

Filename: MARW-TRA-LA-DD-DWG-0002.Dgn

Current Issue Signatures	
Drawn MG	
Designed MN	
Checked ME	
Approved DKI	

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: NOTES AND DRAWING INDEX SHEET 2 OF 2 LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0002

Issue C

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0002.Dgn

Moorebank Avenue Realignment Works
PLANTING SCHEDULE

CODE	BOTANIC NAME	COMMON NAME		MATURE SIZE H x W	INSTALL SIZE	QUANTITY
	TREES					
	BROADSCALE TREES					
A. bakeri	*Angophora bakeri*	Narrow-leaved Apple		10 x 6	Tubestock	135
E. crebra	*Eucalyptus crebra*	Narrow-leaved Ironbark		30 x 15	Tubestock	89
E. fibrosa	*Eucalyptus fibrosa*	Red Ironbark		35 x 10	Tubestock	84
E. longifolia	*Eucalyptus longifolia*	Woollybutt		35 x 10	Tubestock	21
E. parramattensis	*Eucalyptus parramattensis*	Parramatta Red Gum		15 x 6	Tubestock	119
E. sclerophylla	*Eucalyptus sclerophylla*	Hardy-leaved Scribbly Gum		20 x 10	Tubestock	86
				TREE TOTAL		**534**
	MEDIAN TREES					
T. laurina	*Tristaniopsis laurina*	Water Gum		15 x 6	45Ltr	283
				TREE TOTAL		**283**
	FEATURE TREES					
C. maculata	*Corymbia maculata*	Spotted Gum		30 x 15	45Ltr	30
				TREE TOTAL		**30**

CODE	BOTANIC NAME	COMMON NAME	DENSITY		MATURE SIZE H x W	POT SIZE	QUANTITY
	SHRUBS						
	DRAINAGE INVERT						
C. appressa	*Carex appressa*	Tall Sedge	8	/m^2	1 x 1	Tubestock	6433
F. nodosa	*Ficinia nodosa*	Knobby Club-rush	8	/m^2	1 x 1	Tubestock	6433
J. usitatus	*Juncus usitatus*	Common Rush	8	/m^2	1.2 x 0.5	Tubestock	6433
					SHRUB TOTAL		**19299**
	MEDIAN						
L. longifolia	*Lomandra longifolia*	Spiny-Head Mat-rush	6	/m^2	1.2 x 1	Tubestock	20000
L. tanika	*Lomandra tanika*	Mat-rush	6	/m^2	0.6 x 0.65	Tubestock	23432
M. parvifolium	*Myoporum parvifolium*	Creeping Boobialla	4	/m^2	0.3 x 3	Tubestock	1100
					SHRUB TOTAL		**44532**
	NOISE WALL / TYPE 1 RETAINING WALL						
C. viminalis	*Callistemon viminalis*	Callistemon 'Captain Cook'	1.5	/m^2	2 x 1.5	5Ltr	1043
L. longifolia	*Lomandra longifolia*	Spiny-Head Mat-rush	6	/m^2	1.2 x 1	Tubestock	4956
S. virgata	*Sannantha virgata*	Baeckea	2	/m^2	1 x 1.5	2.5Ltr	2085
					SHRUB TOTAL		**8084**
	TYPE 2 RETAINING WALL or where shown						
L. longifolia	*Lomandra longifolia*	Spiny-Head Mat-rush	6	/m^2	1.2 x 1	Tubestock	72582
					SHRUB TOTAL		**72582**
	TURF						
Z. japonica	*Zoysia japonica*	Empire Zoysia			**AREA TOTAL**		**21971**

Issue	Description	Date
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: NTS
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0121.Dgn

Current Issue Signatures
Drawn: MG
Designed: MN
Checked: ME
Approved: DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

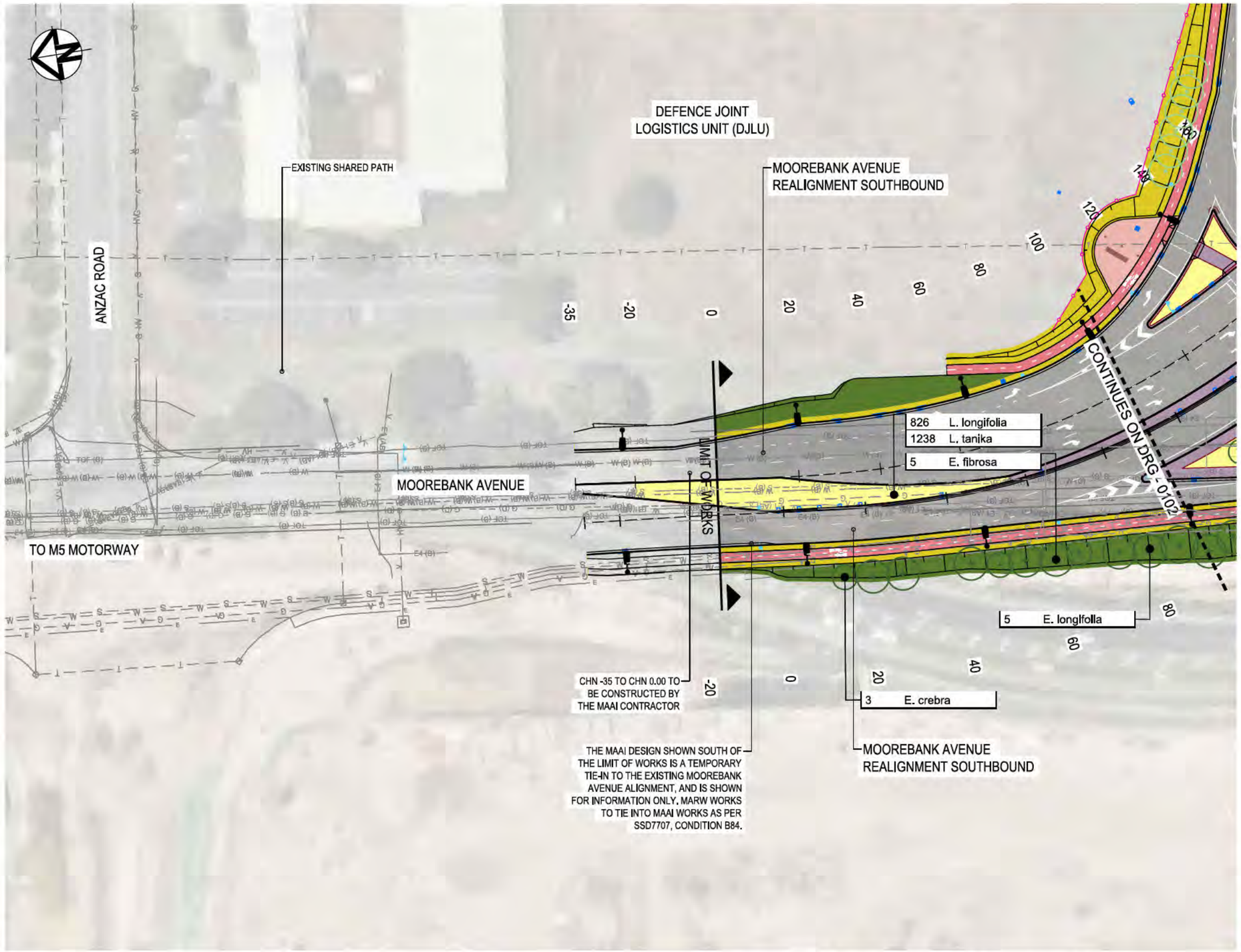
Title: PLANTING SCHEDULE
SHEET 1 OF 2
LANDSCAPE DESIGN

ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0121 Issue C

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0121.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER — REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER — REFER TO ENGINEERS DETAIL
- RETAINING WALL — REFER TO ENGINEERS DETAIL
- LIGHTING — REFER TO ENGINEERS DETAIL
- SIGNAGE — REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT — REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION — REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL — BFM OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE

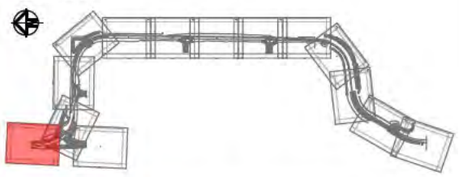
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE — 100mm TURF UNDERLAY OVER 200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT — JUTE MESH OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE
- BIOFILTRATION BASIN — REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1:1000	Drawn MG	
Original Size	A3	Designed MN	
Height Datum	AHD	Checked ME	
Grid	MGA94 - 56	Approved DKI	
Filename:	MARW-TRA-LA-DD-DWG-0101.Dgn		

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: GENERAL ARRANGEMENT PLAN
SHEET 1 OF 14
LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0101 Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0101.Dgn

DEFENCE JOINT LOGISTICS UNIT (DJLU)

MOOREBANK AVENUE REALIGNMENT SOUTHBOUND

DJLU ACCESS ROAD

MOOREBANK AVENUE REALIGNMENT NORTHBOUND

MOOREBANK AVENUE

EXISTING DISPLAY SUITE

6 C. maculata

13 C. maculata

3 A. bakeri

778 L. longifolia

11 E. fibrosa

5 E. longifolia

20 T. laurina

1164 L. longifolia

1747 L. tanika

3 E. crebra

1992 L. longifolia

1100 M. parvifolium

7 E. crebra

3 A. bakeri

5 E. crebra

7 E. crebra

3 A. bakeri

CONTINUES ON DWG - 0101

CONTINUES ON DWG - 0103

CONTINUES ON DWG - 0114

LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER REFER TO ENGINEERS DETAIL
- RETAINING WALL REFER TO ENGINEERS DETAIL
- LIGHTING REFER TO ENGINEERS DETAIL
- SIGNAGE REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL BFM OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE

GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE 100mm TURF UNDERLAY OVER 200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT JUTE MESH OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE
- BIOFILTRATION BASIN REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN

Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0102.Dgn

Current Issue Signatures
Drawn: MG
Designed: MN
Checked: ME
Approved: DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: GENERAL ARRANGEMENT PLAN
SHEET 2 OF 14
LANDSCAPE DESIGN

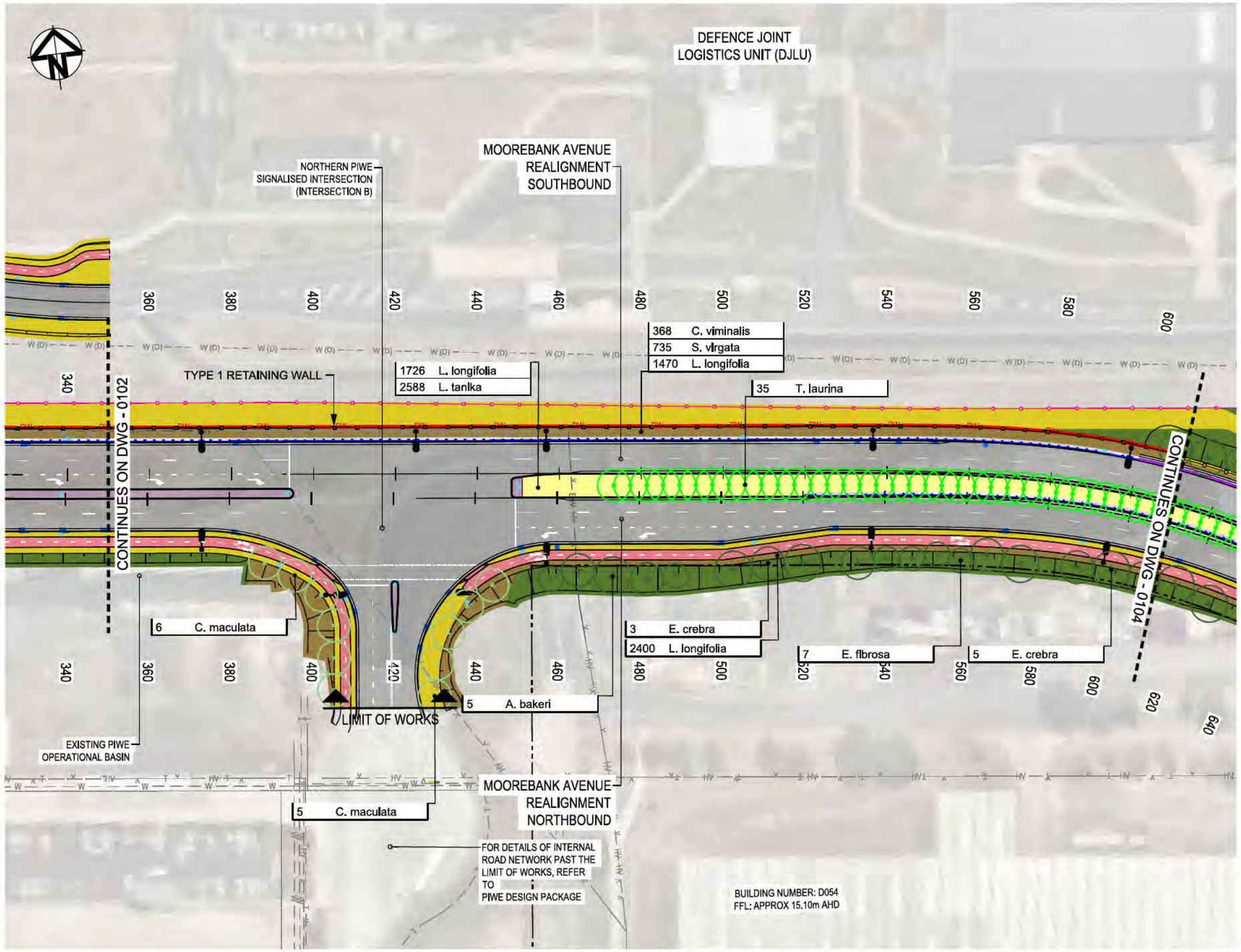
ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0102

Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0102.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER — REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER — REFER TO ENGINEERS DETAIL
- RETAINING WALL — REFER TO ENGINEERS DETAIL
- LIGHTING — REFER TO ENGINEERS DETAIL
- SIGNAGE — REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT — REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION — REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL — BFM OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE

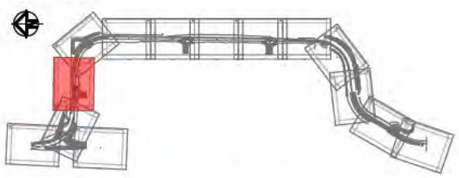
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE — 100mm TURF UNDERLAY OVER 200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT — JUTE MESH OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE
- BIOFILTRATION BASIN — REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
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B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0103.Dgn

Current Issue Signatures
Drawn MG
Designed MN
Checked ME
Approved DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: GENERAL ARRANGEMENT PLAN
SHEET 3 OF 14
LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0103 Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0103.Dgn

DEFENCE JOINT
LOGISTICS UNIT (DJLU)

MOOREBANK AVENUE
REALIGNMENT SOUTHBOUND

5 E. fibrosa
5 A. bakeri
7 E. crebra
3 E. longlfolla
5 A. bakeri
1131 J. usitatus
1131 C. appressa
1131 F. nodosa
177 C. viminalis
354 S. virgata
600 J. usitatus
600 C. appressa
600 F. nodosa
5 E. fibrosa
7 E. fibrosa
3 A. bakeri
3 E. crebra
58 T. laurina
5 A. bakeri
5 E. crebra
2356 L. longifolia
3533 L. tanika
3 E. fibrosa
1963 L. longlfolla
5 E. crebra
3 A. bakeri

CONTINUES ON DWG - 0103

CONTINUES ON DWG - 0105

MOOREBANK AVENUE
REALIGNMENT
NORTHBOUND

BUILDING NUMBER: D054
FFL: APPROX 15.10 m AHD

LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER
  REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER
  REFER TO ENGINEERS DETAIL
- RETAINING WALL
  REFER TO ENGINEERS DETAIL
- LIGHTING
  REFER TO ENGINEERS DETAIL
- SIGNAGE
  REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT
  REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION
  REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL
  BFM OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE

GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE
  100mm TURF UNDERLAY OVER
  200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT
  JUTE MESH OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE
- BIOFILTRATION BASIN
  REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN

Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0104.Dgn

Current Issue Signatures
Drawn: MG
Designed: MN
Checked: ME
Approved: DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: GENERAL ARRANGEMENT PLAN
SHEET 4 OF 14
LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0104 Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0104.Dgn

DEFENCE JOINT
LOGISTICS UNIT (DJLU)

MOOREBANK AVENUE
REALIGNMENT SOUTHBOUND

840 860 880 900 920 940 960 980 1000 1020 1040 1060 1080 1100 1120

TYPE 1 RETAINING WALL

CONTINUES ON DWG - 0104

64 T. laurina

498 C. viminalis
996 S. virgata
1992 L. longifolia

CONTINUES ON DWG - 0106

7 E. fibrosa

7 E. crebra

3243 L. longifolia
4864 L. tanlka

7 E. fibrosa
2346 L. longifolia

2240 L. longifolia

820 840 860 880 900 920 940 960 980 1000 1020 1040 1060 1080 1100

ITV ROAD

MOOREBANK AVENUE
REALIGNMENT NORTHBOUND

BUILDING NUMBER: D053
FFL: APPROX 15.10m AHD

BUILDING NUMBER: D052
FFL: APPROX 16m AHD

LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER
  REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER
  REFER TO ENGINEERS DETAIL
- RETAINING WALL
  REFER TO ENGINEERS DETAIL
- LIGHTING
  REFER TO ENGINEERS DETAIL
- SIGNAGE
  REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT
  REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION
  REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL
  BFM OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE

GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE
  100mm TURF UNDERLAY OVER
  200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT
  JUTE MESH OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE
- BIOFILTRATION BASIN
  REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN

Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0105.Dgn

Current Issue Signatures
Drawn: MG
Designed: MN
Checked: ME
Approved: DKI

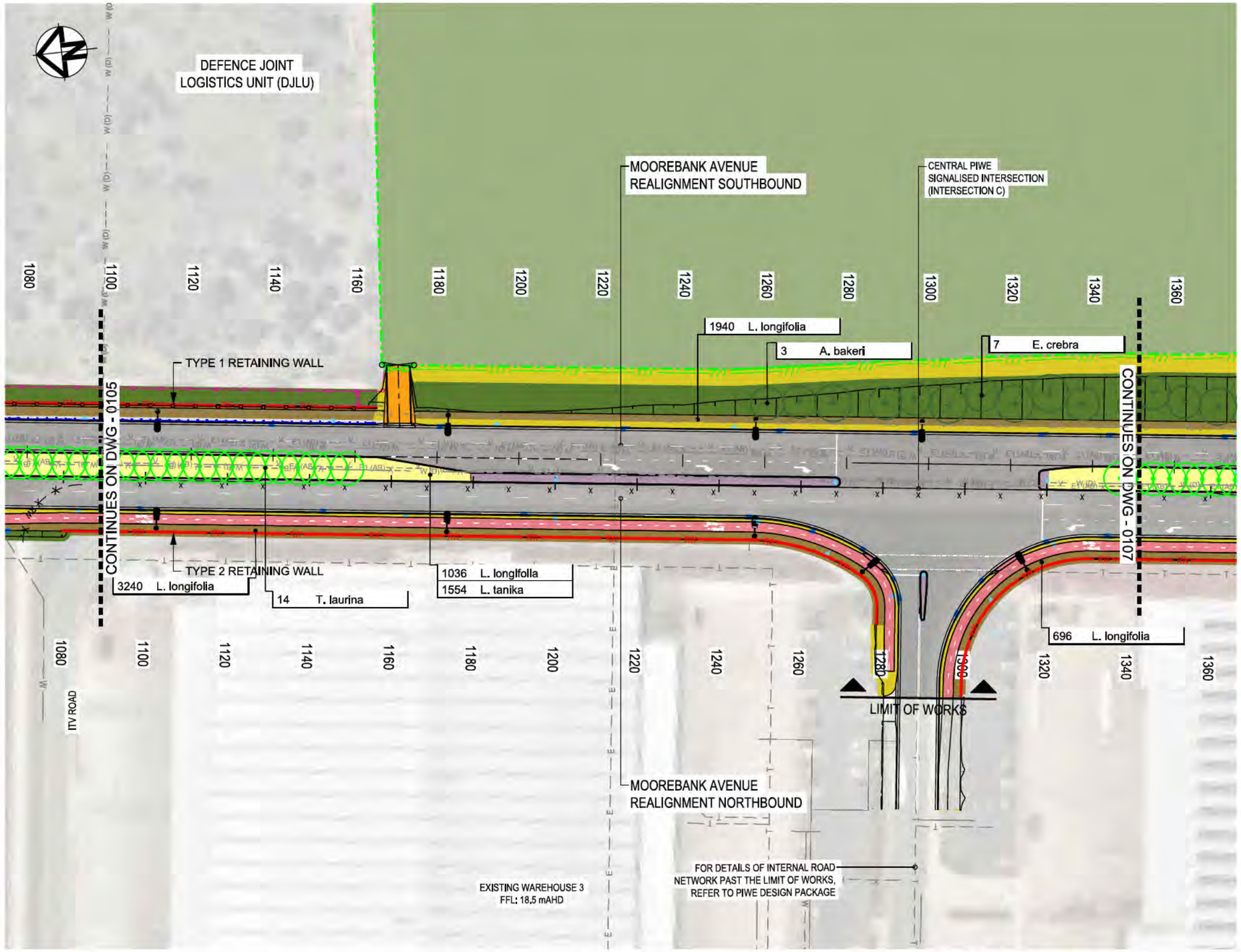
Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: GENERAL ARRANGEMENT PLAN
SHEET 5 OF 14
LANDSCAPE DESIGN

ARCADIS
Tract

Project No. 30100351
Drawing No. MARW-TRA-LA-DD-DWG-0105
Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0105.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER — REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER — REFER TO ENGINEERS DETAIL
- RETAINING WALL — REFER TO ENGINEERS DETAIL
- LIGHTING — REFER TO ENGINEERS DETAIL
- SIGNAGE — REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT — REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION — REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL — BFM OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE

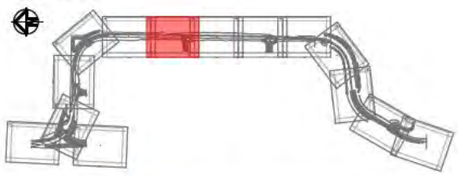
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE — 100mm TURF UNDERLAY OVER 200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT — JUTE MESH OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE
- BIOFILTRATION BASIN — REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0106.Dgn

Current Issue Signatures
Drawn MG
Designed MN
Checked ME
Approved DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

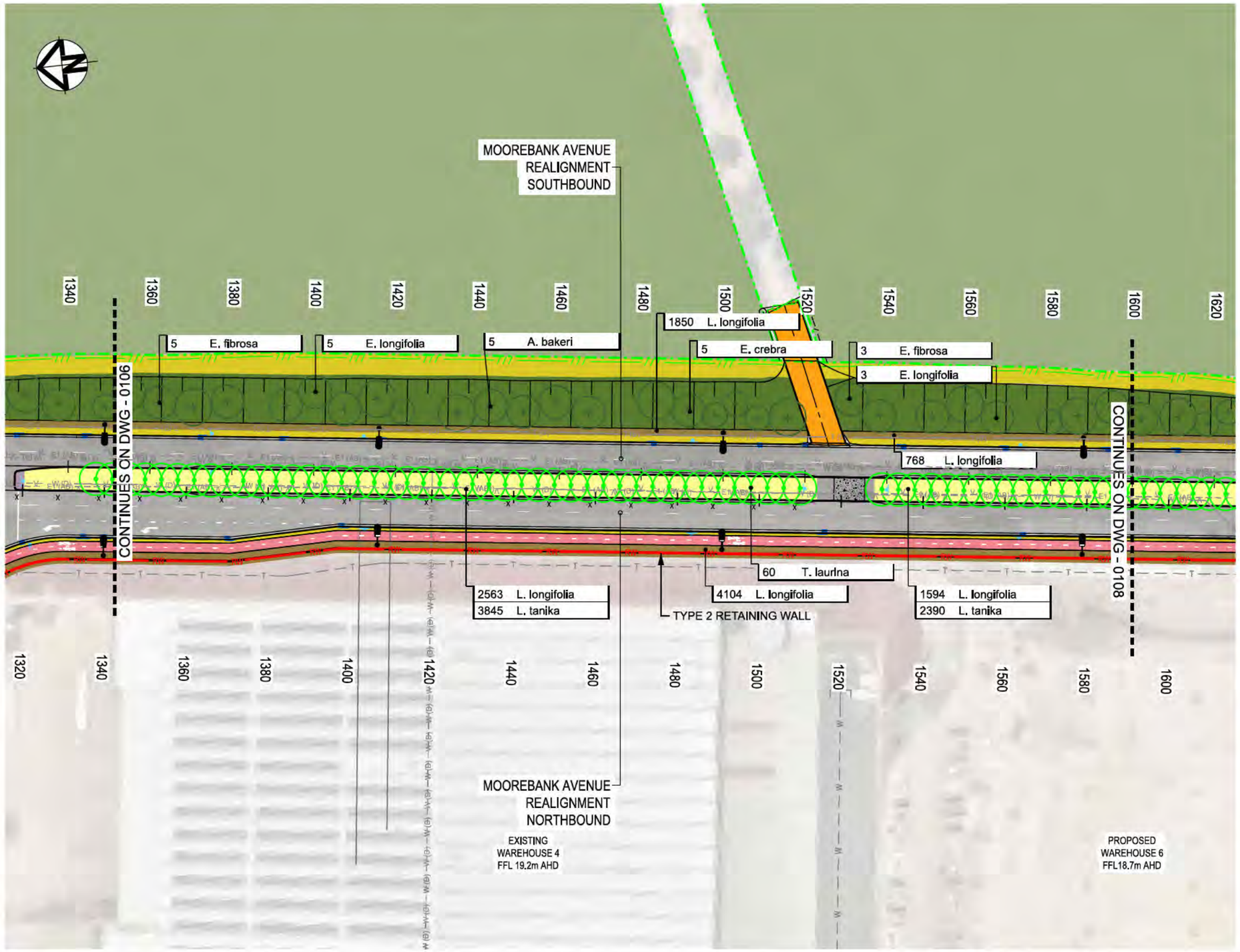
Title: GENERAL ARRANGEMENT PLAN
SHEET 6 OF 14
LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0106 Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0106.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER — REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER — REFER TO ENGINEERS DETAIL
- RETAINING WALL — REFER TO ENGINEERS DETAIL
- LIGHTING — REFER TO ENGINEERS DETAIL
- SIGNAGE — REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT — REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION — REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL — BFM OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE

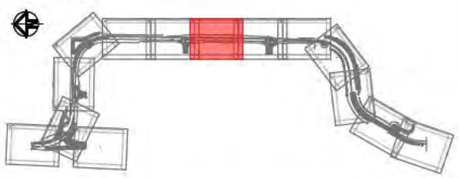
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE — 100mm TURF UNDERLAY OVER 200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT — JUTE MESH OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE
- BIOFILTRATION BASIN — REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0107.Dgn

Current Issue Signatures
Drawn: MG
Designed: MN
Checked: ME
Approved: DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

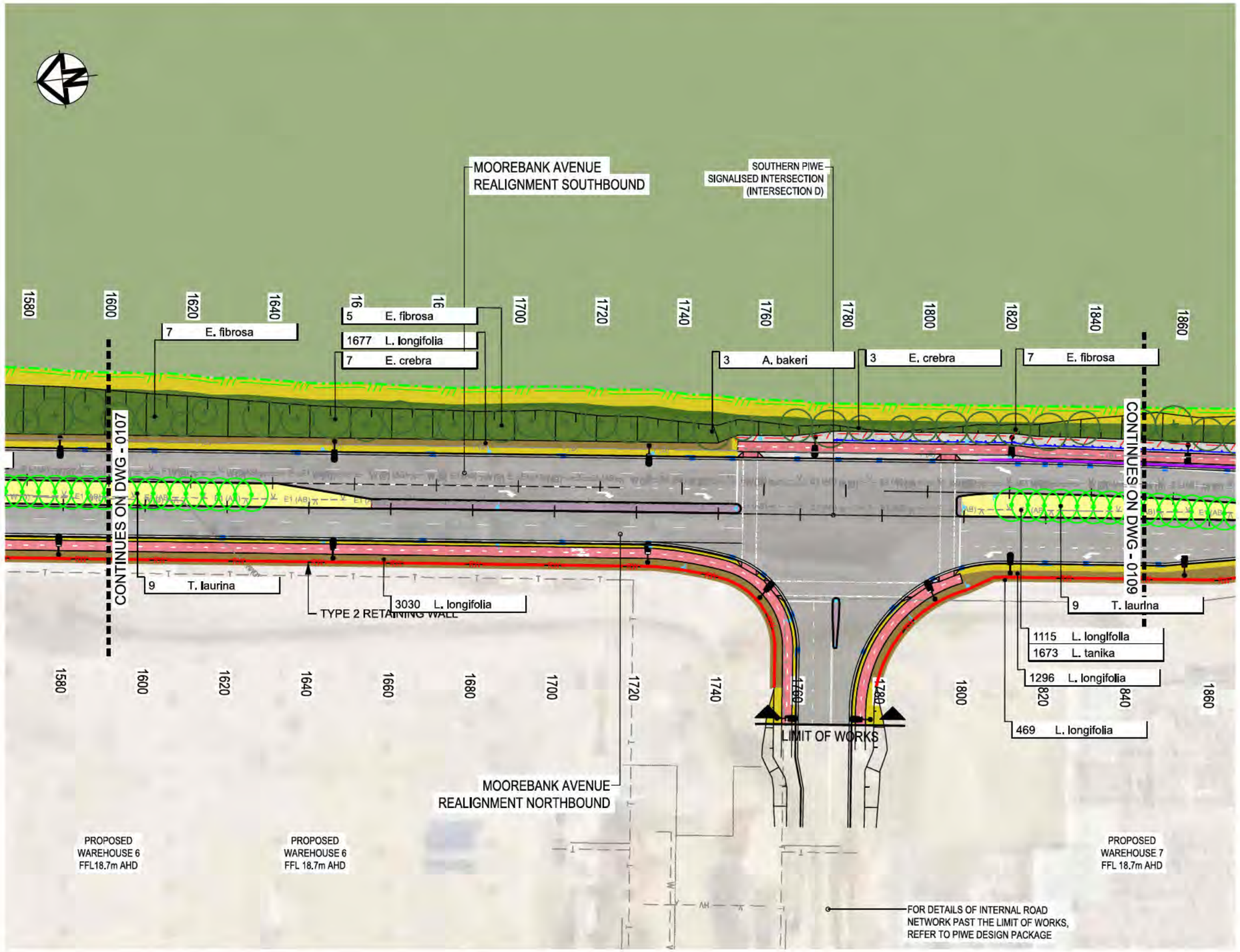
Title: GENERAL ARRANGEMENT PLAN
SHEET 7 OF 14
LANDSCAPE DESIGN

ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0107
Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0107.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER
  REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER
  REFER TO ENGINEERS DETAIL
- RETAINING WALL
  REFER TO ENGINEERS DETAIL
- LIGHTING
  REFER TO ENGINEERS DETAIL
- SIGNAGE
  REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT
  REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION
  REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL
  BFM OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE

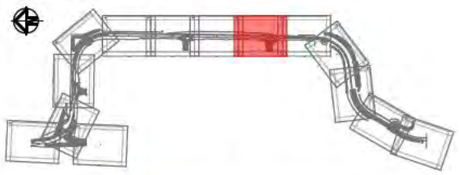
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE
  100mm TURF UNDERLAY OVER
  200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT
  JUTE MESH OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE
- BIOFILTRATION BASIN
  REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures
Scales	1:1000	Drawn MG
Original Size	A3	Designed MN
Height Datum	AHD	Checked ME
Grid	MGA94 - 56	Approved DKI
Filename:	MARW-TRA-LA-DD-DWG-0108.Dgn	

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: GENERAL ARRANGEMENT PLAN
SHEET 8 OF 14
LANDSCAPE DESIGN

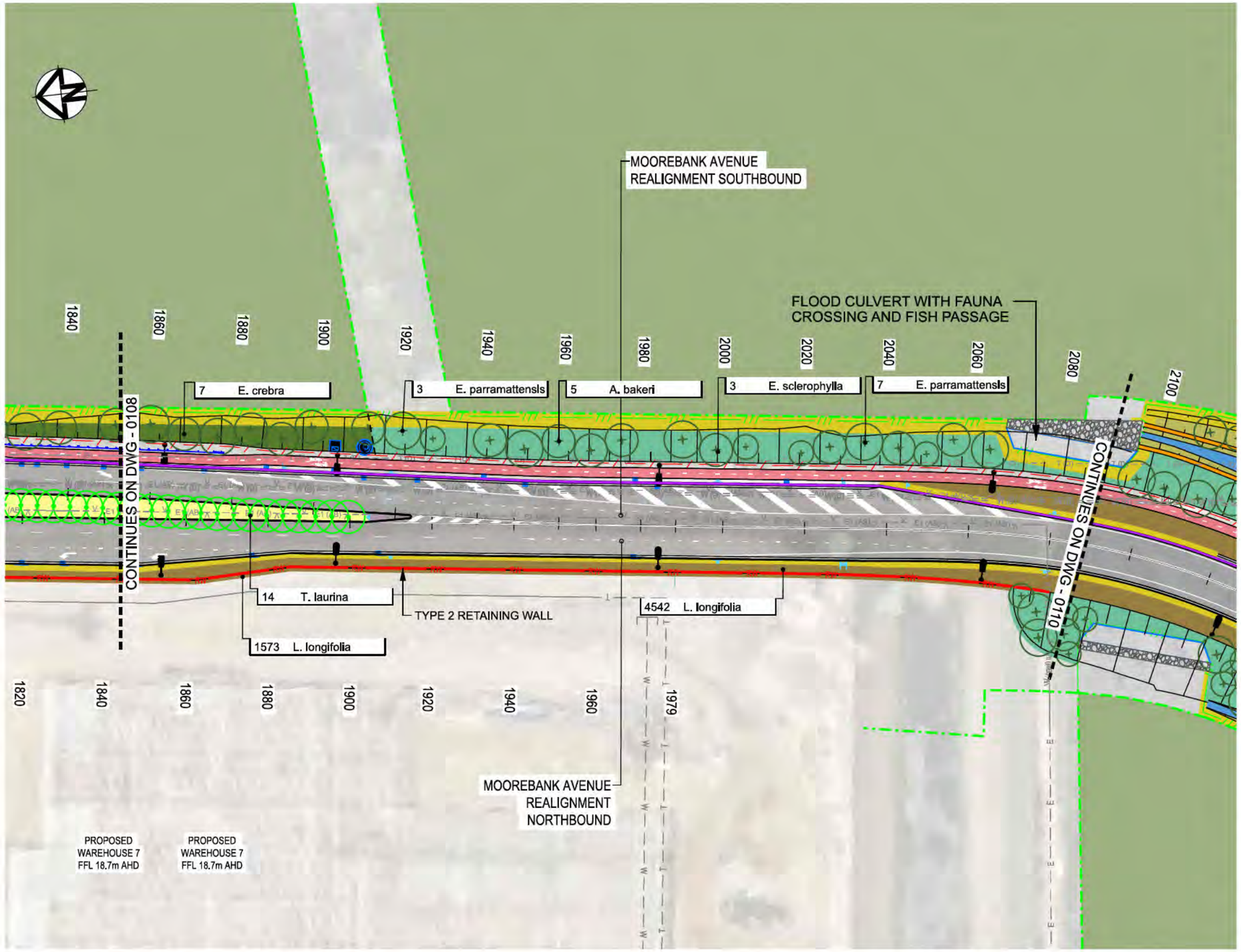
ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0108

Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0108.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER
  REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER
  REFER TO ENGINEERS DETAIL
- RETAINING WALL
  REFER TO ENGINEERS DETAIL
- LIGHTING
  REFER TO ENGINEERS DETAIL
- SIGNAGE
  REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT
  REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION
  REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL
  BFM OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE

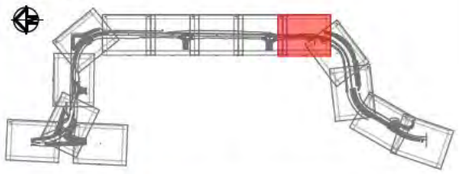
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE
  100mm TURF UNDERLAY OVER
  200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT
  JUTE MESH OVER
  50mm TOPSOIL OVER
  SCARIFIED SUBGRADE
- BIOFILTRATION BASIN
  REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0109.Dgn

Current Issue Signatures
Drawn: MG
Designed: MN
Checked: ME
Approved: DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

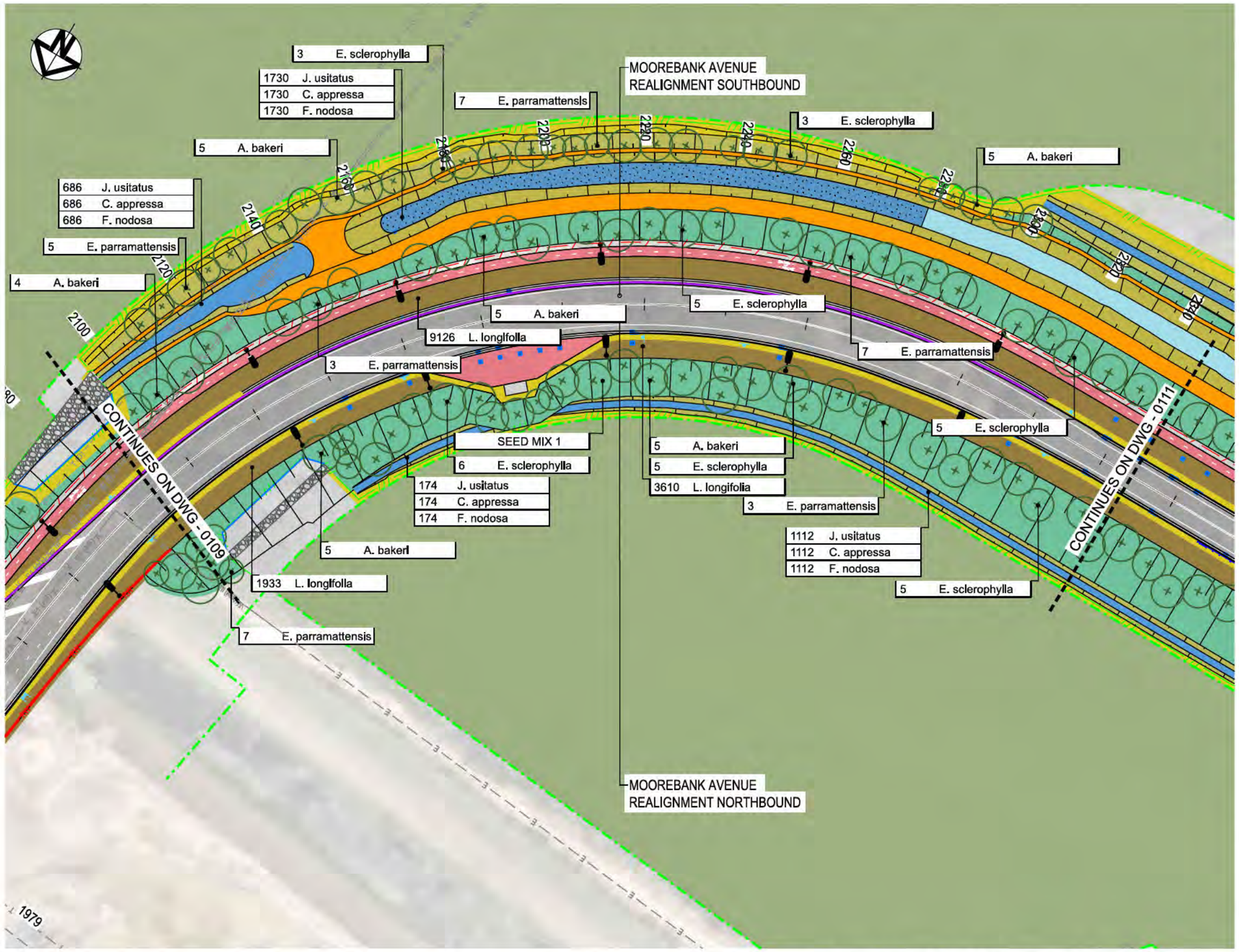
Title: GENERAL ARRANGEMENT PLAN
SHEET 9 OF 14
LANDSCAPE DESIGN

ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0109
Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0109.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
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- THRIE BEAM BARRIER — REFER TO ENGINEERS DETAIL
- RETAINING WALL — REFER TO ENGINEERS DETAIL
- LIGHTING — REFER TO ENGINEERS DETAIL
- SIGNAGE — REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT — REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION — REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL — BFM OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE

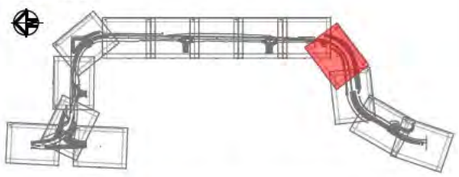
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE — 100mm TURF UNDERLAY OVER 200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT — JUTE MESH OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE
- BIOFILTRATION BASIN — REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0110.Dgn

Current Issue Signatures
Drawn: MG
Designed: MN
Checked: ME
Approved: DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

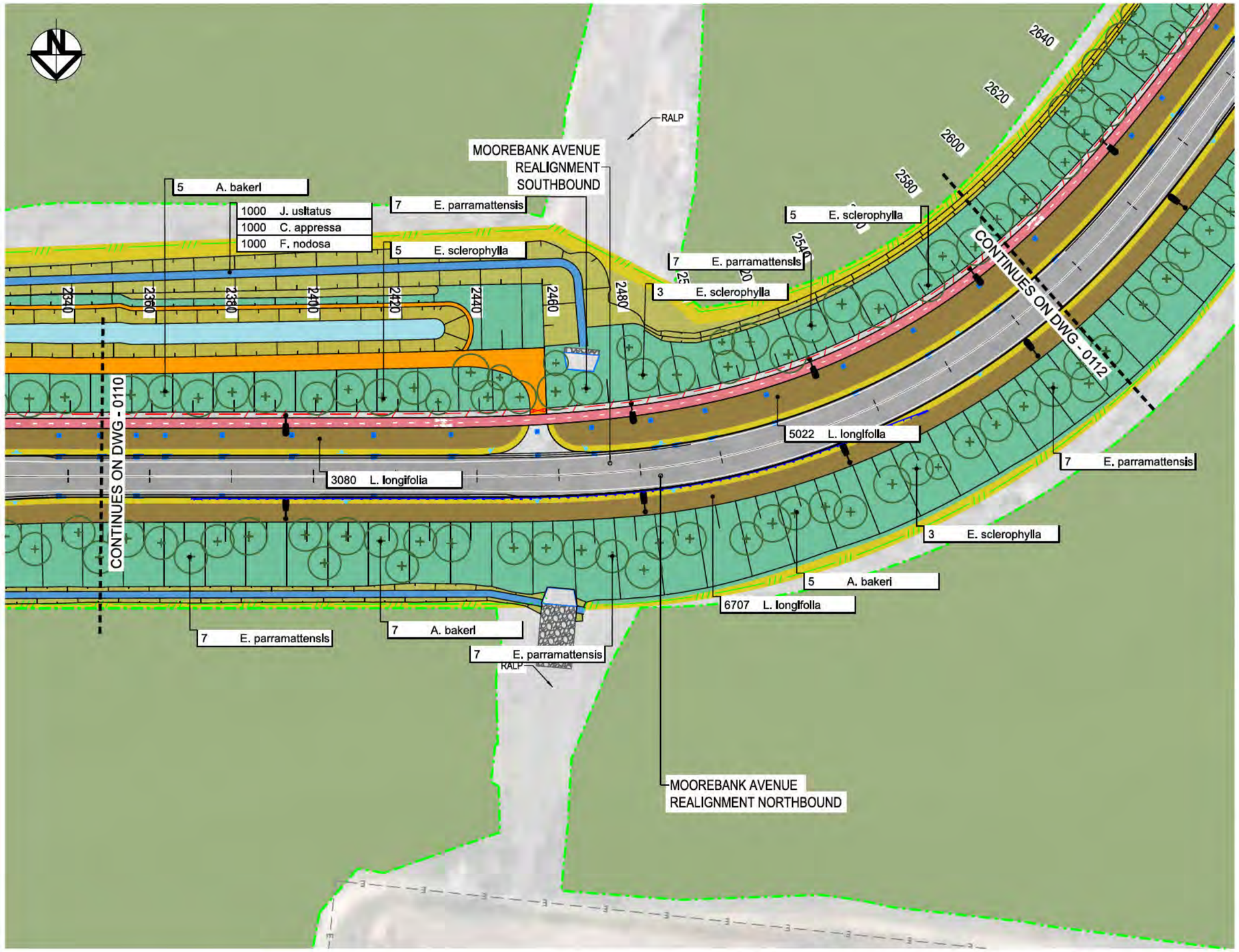
Title: GENERAL ARRANGEMENT PLAN
SHEET 10 OF 14
LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0110 Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0110.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER — REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER — REFER TO ENGINEERS DETAIL
- RETAINING WALL — REFER TO ENGINEERS DETAIL
- LIGHTING — REFER TO ENGINEERS DETAIL
- SIGNAGE — REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT — REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION — REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL — BFM OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE

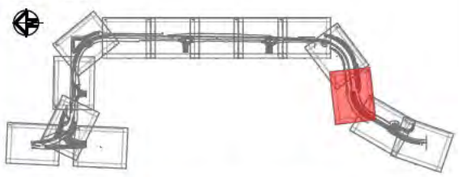
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE — 100mm TURF UNDERLAY OVER 200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT — JUTE MESH OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE
- BIOFILTRATION BASIN — REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0111.Dgn

Current Issue Signatures
Drawn MG
Designed MN
Checked ME
Approved DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

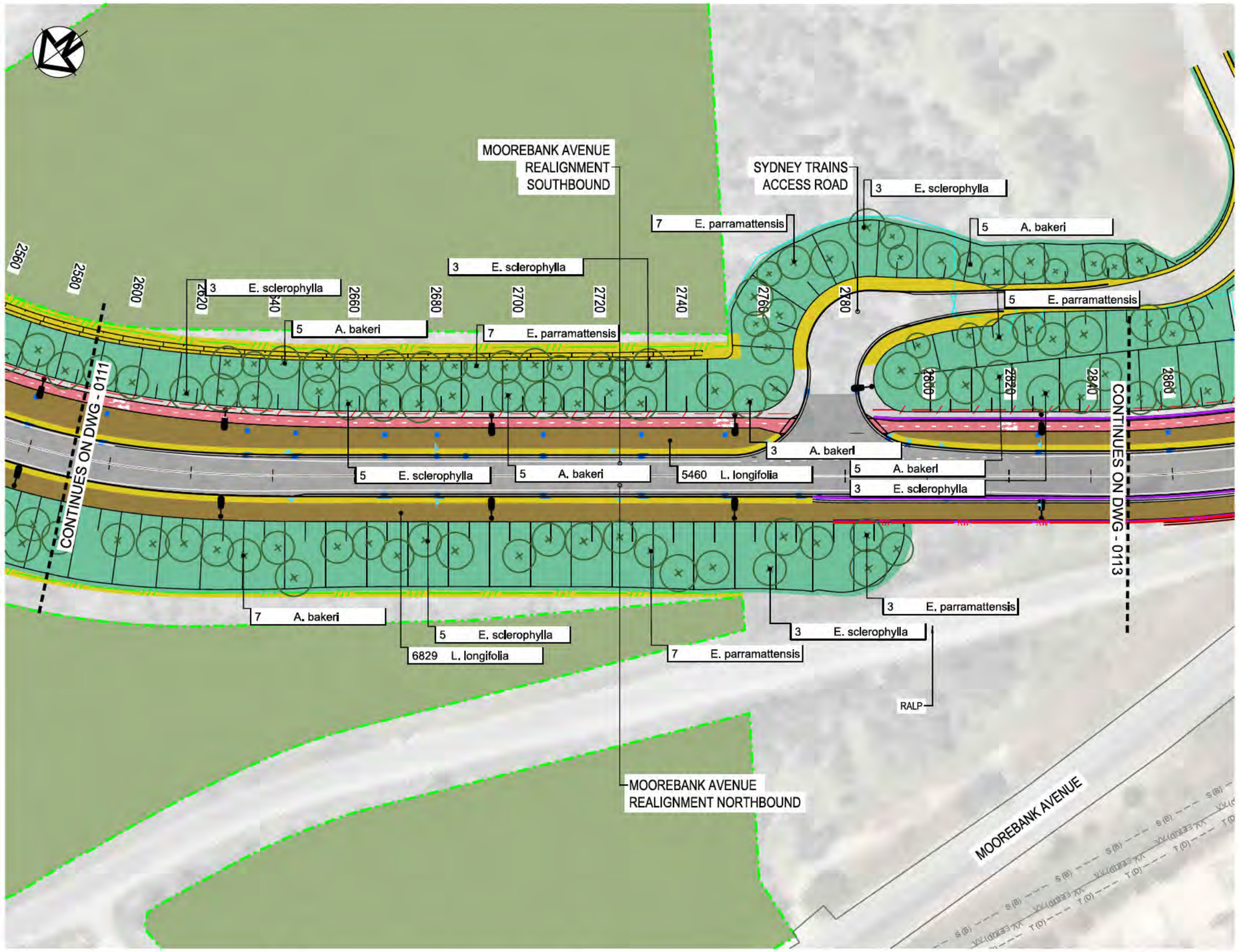
Title: GENERAL ARRANGEMENT PLAN
SHEET 11 OF 14
LANDSCAPE DESIGN

ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0111
Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0111.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER — REFER TO ENGINEERS DETAIL
- THRIE BEAM BARRIER — REFER TO ENGINEERS DETAIL
- RETAINING WALL — REFER TO ENGINEERS DETAIL
- LIGHTING — REFER TO ENGINEERS DETAIL
- SIGNAGE — REFER TO ENGINEERS DETAIL
- HEADWALL & CULVERT — REFER TO ENGINEERS DETAIL
- SCOUR PROTECTION — REFER TO ENGINEERS DETAIL
- MEDIAN PAVED
- SHARED PATH
- MAINTENANCE ACCESS PATH
- BASIN

SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL — BFM OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE

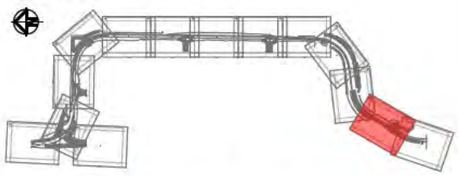
GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE — 100mm TURF UNDERLAY OVER 200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT — JUTE MESH OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE
- BIOFILTRATION BASIN — REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
D	100% DETAILED DESIGN RESUBMISSION	24.05.2024
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0112.Dgn

Current Issue Signatures
Drawn: MG
Designed: MN
Checked: ME
Approved: DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: GENERAL ARRANGEMENT PLAN
SHEET 12 OF 14
LANDSCAPE DESIGN

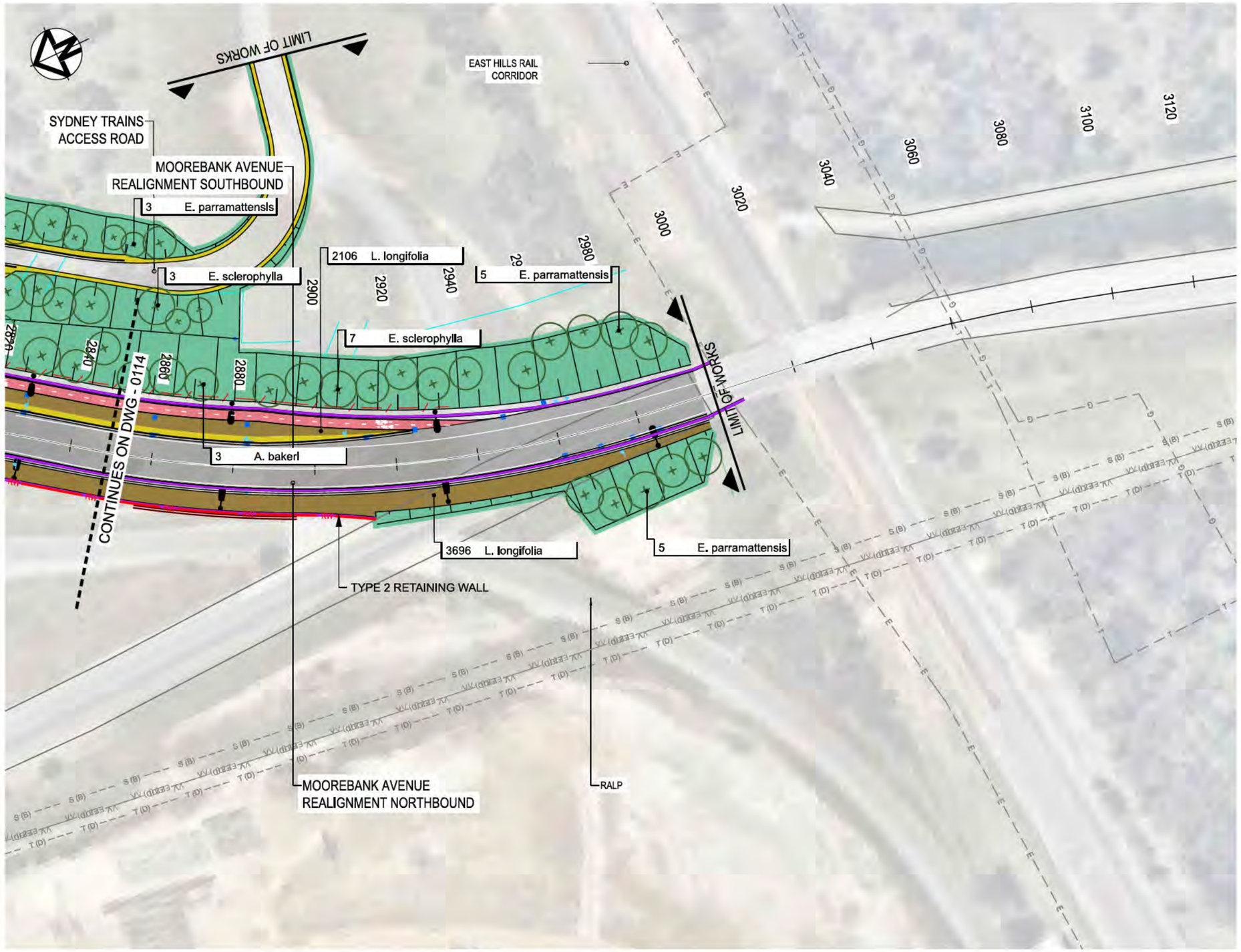
ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0112
Issue D

50mm on Original

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0112.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
- SYDNEY TRAIN FENCE
- VISUAL SCREENING FENCE
- BARRIER — REFER TO ENGINEERS DETAIL
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- LIGHTING — REFER TO ENGINEERS DETAIL
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SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL — BFM OVER 50mm TOPSOIL OVER SCARIFIED SUBGRADE

GARDEN BED
100mm MULCH OVER
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- BIOFILTRATION BASIN — REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
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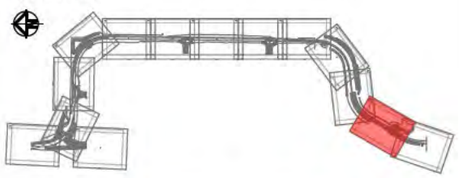
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
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B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: 1:1000
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0113.Dgn

Current Issue Signatures
Drawn MG
Designed MN
Checked ME
Approved DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

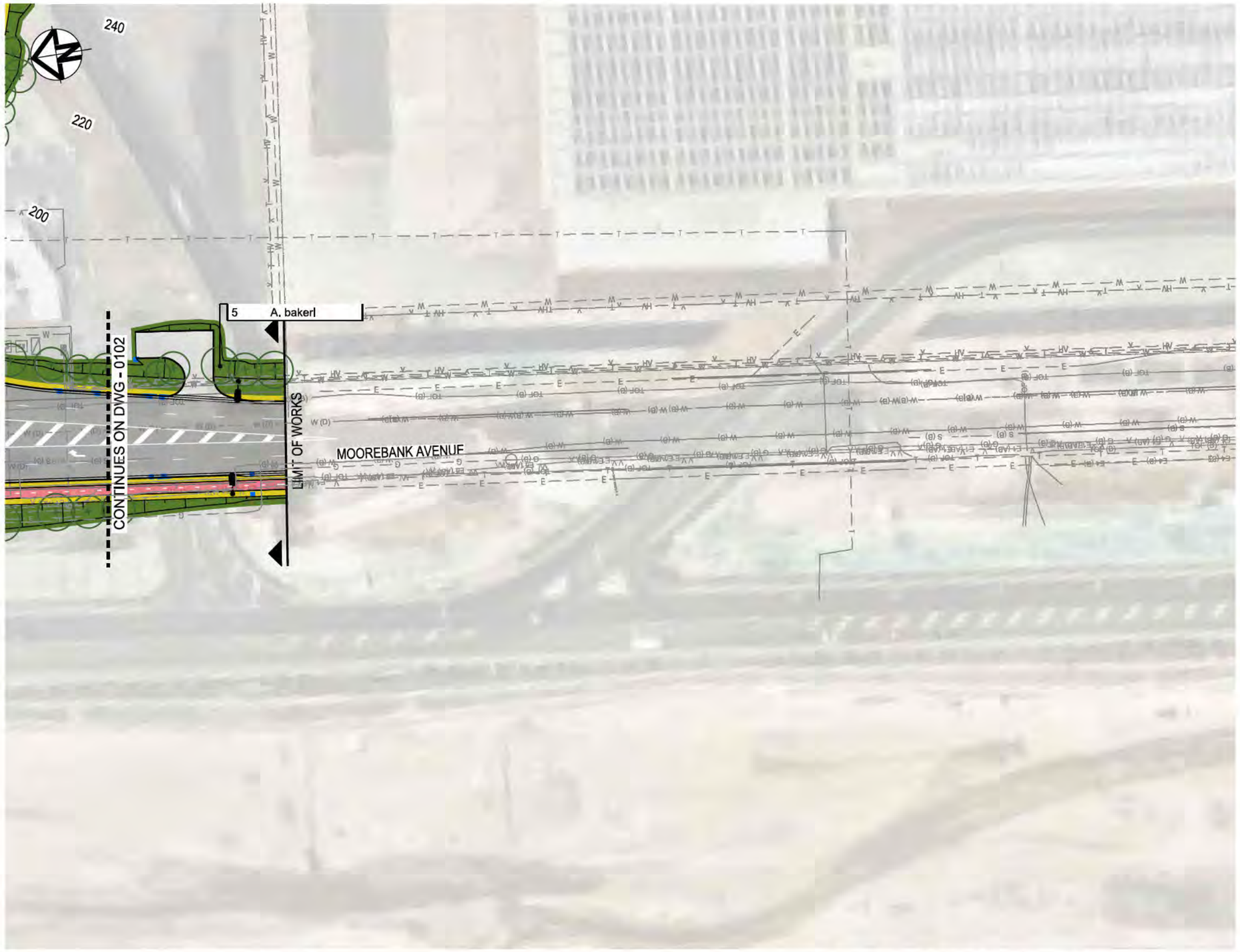
Title: GENERAL ARRANGEMENT PLAN
SHEET 13 OF 14
LANDSCAPE DESIGN

ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0113
Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0113.Dgn



LEGEND

- PROTECTED AREA - BIO BANK
- BOUNDARY FENCE
- FAUNA FENCE
- CHAINLINK FENCE
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SEED MIXES
HYDROMULCH OVER
150mm TOPSOIL OVER
300mm CULTIVATED SUBGRADE

- SEED MIX 1 - WOODLAND
- SEED MIX 2 - GRASSY OPEN FOREST
- DRAINAGE CHANNEL — BFM OVER, 50mm TOPSOIL OVER, SCARIFIED SUBGRADE

GARDEN BED
100mm MULCH OVER
300mm TOPSOIL OVER
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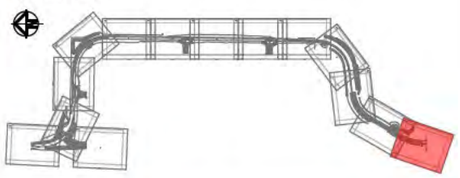
- MEDIAN GARDEN BED
- VERGE GARDEN BED
- GRASSED VERGE — 100mm TURF UNDERLAY OVER, 200mm CULTIVATED SUBGRADE
- DRAINAGE INVERT — JUTE MESH OVER, 50mm TOPSOIL OVER, SCARIFIED SUBGRADE
- BIOFILTRATION BASIN — REFER ENGINEER'S DETAILS

TREE PLANTING

- FEATURE TREE
- BROADSCALE TREE
- MEDIAN TREE

KEY PLAN



Issue	Description	Date
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C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

0 20 40m
1 : 1000

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1:1000	Drawn MG	
Original Size	A3	Designed MN	
Height Datum	AHD	Checked ME	
Grid	MGA94 - 56	Approved DKI	
Filename:	MARW-TRA-LA-DD-DWG-0114.Dgn		

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: GENERAL ARRANGEMENT PLAN
SHEET 14 OF 14
LANDSCAPE DESIGN

ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0114 Issue D

Date Plotted: 7 Sep 2005 - 07:08PM File Name: T:\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0114.Dgn

Landscape Treatment Types	Species	Application rates of seed kg/ha	Area to be hydromulched
Seed Mix 1 - Hard leaved scribbly gum- parramatta red gum heathy woodland		Area	25,176
Cover Crop			
	Echinochloa utilis (Sep-Mar)		
	or	10	**25.2**
	Lolium multiflorum (Apr - Aug)		
	Secale cereale (Apr - Aug)	10	**25.2**
	Cynodon dactylon	20	**50.4**
	Trfolium pratense	5	**12.6**
Total volume of seed		**35**	
Native Mix			
Native Grasses		6	
	Micoleaena stipoides	1.3	**3.4**
	Themeda australis	1.3	**3.4**
	Dianella caerulea	1	**2.5**
	Pomax umbeliata (Pomax)	1.3	**3.4**
	Goodenia bellidifolia subsp. Bellidifolia	1	**2.5**
Total volume of seed (kg)		6.0	***15.1***
Native Shrubs and Groundcovers		6	
	Banksia spinulosa	0.6	**1.5**
	Bursaria spinosa	0.8	**2.0**
	Daviesia ulicifolia	0.8	**2.0**
	Hakea dactyloides	0.8	**2.0**
	Hakea sericea	0.8	**2.0**
	Kunzea capitata	0.8	**2.0**
	Leptospermum trinervium	0.8	**2.0**
	Melaleuca nodosa	0.6	**1.5**
Total volume of seed (kg)		6	***15.1***
			15,106

Landscape Treatment Types	Species	Application rates of seed kg/ha	Area to be hydromulched
Seed Mix 2 - Broadleaved ironbark grey box melaleuca decora grassy open forest		Area	20,094
Cover Crop			
	Echinochloa utilis (Sep-Mar)		
	or	10	***20.1***
	Lolium multiflorum (Apr - Aug)		
	Secale cereale (Apr - Aug)	10	**20.1**
	Cynodon dactylon	20	**40.2**
	Trfolium pratense	5	**10.0**
Total volume of seed		**35**	
Native Mix			
Native Grasses		6	
	Dianella caerulea	0.5	**1.0**
	Dichondra repens	0.7	**1.4**
	Entolasia stricta	0.8	**1.5**
	Goodenia hederacea subsp. hederacea	0.5	**1.0**
	Lepidosperma cf. laterale	0.5	**1.0**
	Lomandra longifolia	0.5	**1.0**
	Lomandra multiflora subsp. multiflora	0.5	**1.0**
	Microlaena stipoides	0.8	**1.5**
	Panicum simile	0.5	**1.0**
	Themeda triandra	0.8	**1.5**
Total volume of seed (kg)		6.0	***12***
Native Trees, Shrubs and Groundcovers		6	
	Acacia falcata	0.5	**1.0**
	Baeckea diosmifolia	0.5	**1.0**
	Breynia oblongifolia	0.5	**1.0**
	Bursaria spinosa	0.5	**1.0**
	Dillwynia retorta	0.5	**1.0**
	Hakea sericea	0.5	**1.0**
	Melaleuca nodosa	0.5	**1.0**
	Melaleuca decora	0.5	**1.0**
	Persoonia linearis	0.5	**1.0**
	Pultenaea villosa	0.5	**1.0**
	Lissanthe strigosa	0.5	**1.0**
	Daviesia ulicifolia	0.5	**1.0**
Total volume of seed (kg)		6.0	***12.1***
			12,057

Seed Mix 3 - Channels		Area	7,145
Cover Crop			
	Echinochloa utilis (Sep-Mar)		
	or	10	***7.1***
	Lolium multiflorum (Apr - Aug)		
	Secale cereale (Apr - Aug)	10	**7.1**
	Cynodon dactylon	20	**14.3**
	Trfolium pratense	5	**3.6**
Total volume of seed		**35**	
Native Mix			
Native Grasses		8	
	Carex appressa		**1.1**
	Favinia nodosa	1.5	**1.1**
	Gahnia sieberiana	1.5	**1.1**
	Hardenbergia violacea	1.5	**1.1**
	Juncus usitatus	1.5	**1.1**
	Total volume of seed (kg)	6.0	***5.7***

Issue	Description	Date
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: NTS
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0122.Dgn

Current Issue Signatures
Drawn MG
Designed MN
Checked ME
Approved DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

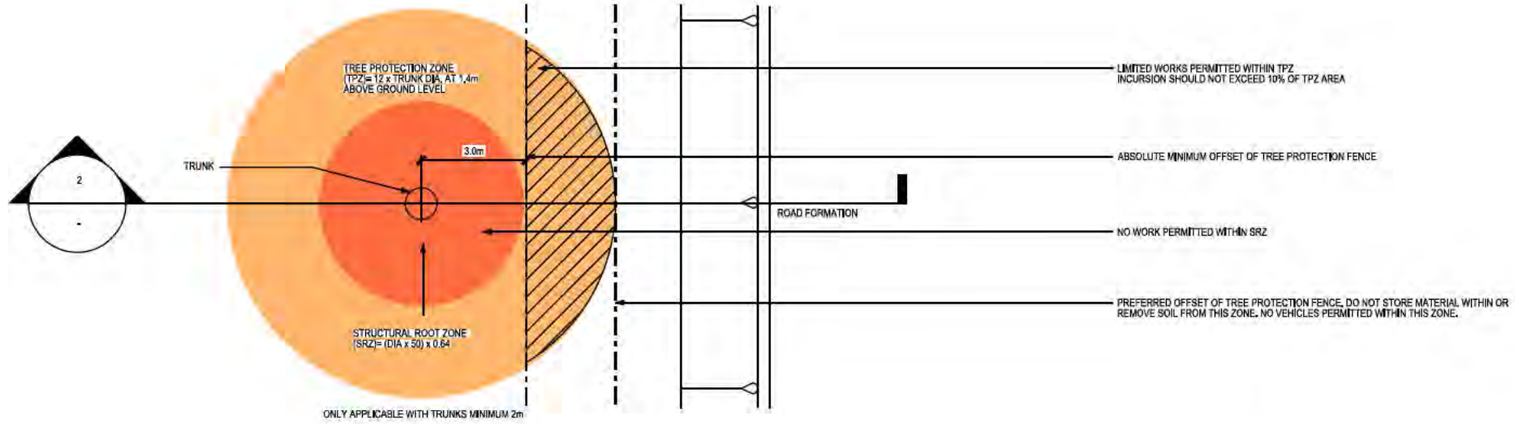
Title: SEED MIX SCHEDULE
SHEET 2 OF 2
LANDSCAPE DESIGN

ARCADIS
Tract

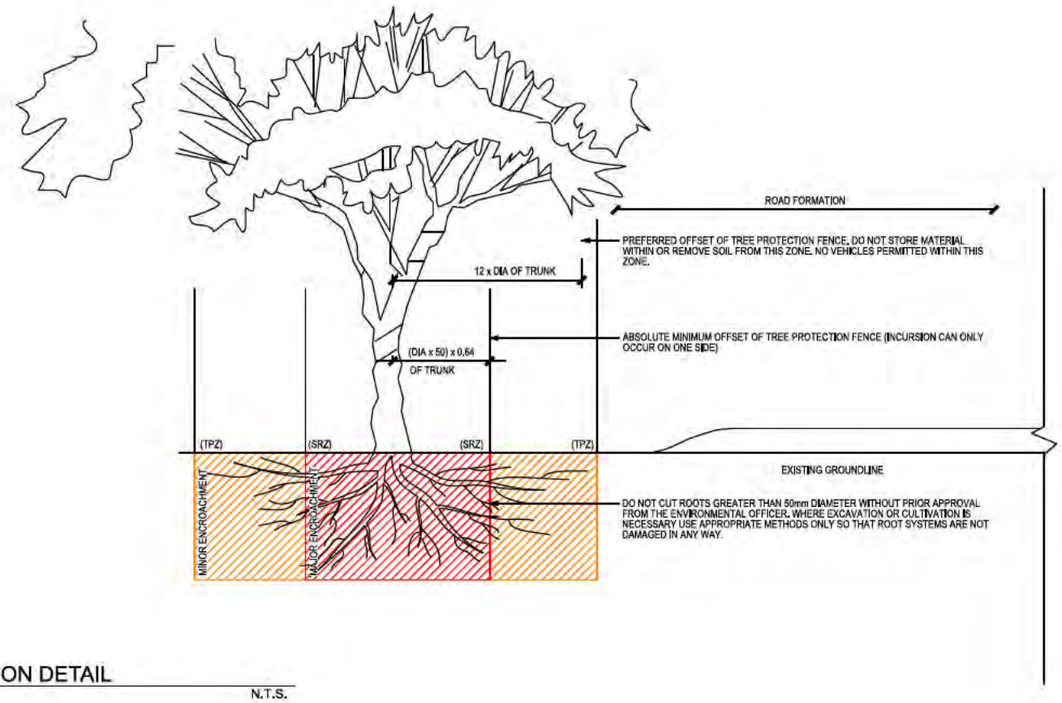
Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0122
Issue C

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0122.Dgn



1 TREE PROTECTION DETAIL PLAN N.T.S.



2 TREE PROTECTION DETAIL SECTION N.T.S.

NOTE:
THIS DETAIL APPLIES TO TREES OTHER THAN THOSE INDICATED WITH THEIR OWN EXCLUSION ZONE.

Issue	Description	Date
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales	NTS	Current Issue Signatures	
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Original Size	A3	Designed MN	
Height Datum	AHD	Checked ME	
Grid	MGA94 - 56	Approved DKI	
Filename:	MARW-TRA-LA-DD-DWG-0201.Dgn		

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

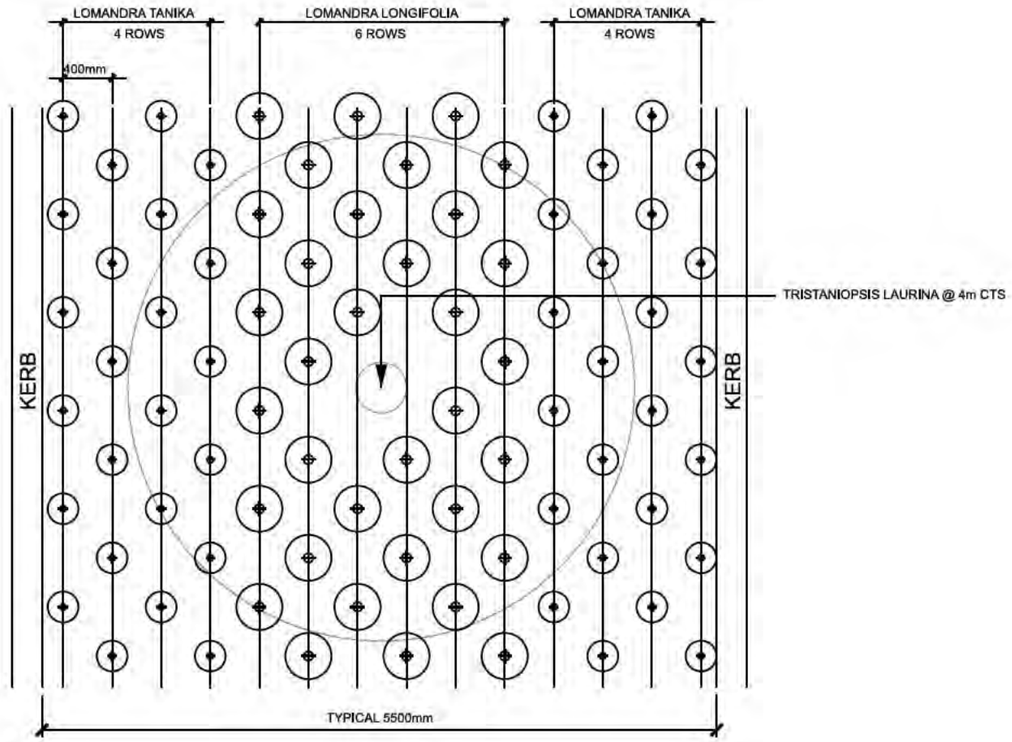
Title: TREE PROTECTION DETAIL
SHEET 1 OF 4
LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0201 Issue C

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0201.Dgn



1 MEDIAN PLANTING DETAIL PLAN N.T.S.

Issue	Description	Date
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales	NTS	Current Issue Signatures	
		Drawn MG	
Original Size	A3	Designed MN	
Height Datum	AHD	Checked ME	
Grid	MGA94 - 56	Approved DKI	
Filename:	MARW-TRA-LA-DD-DWG-0202.Dgn		

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

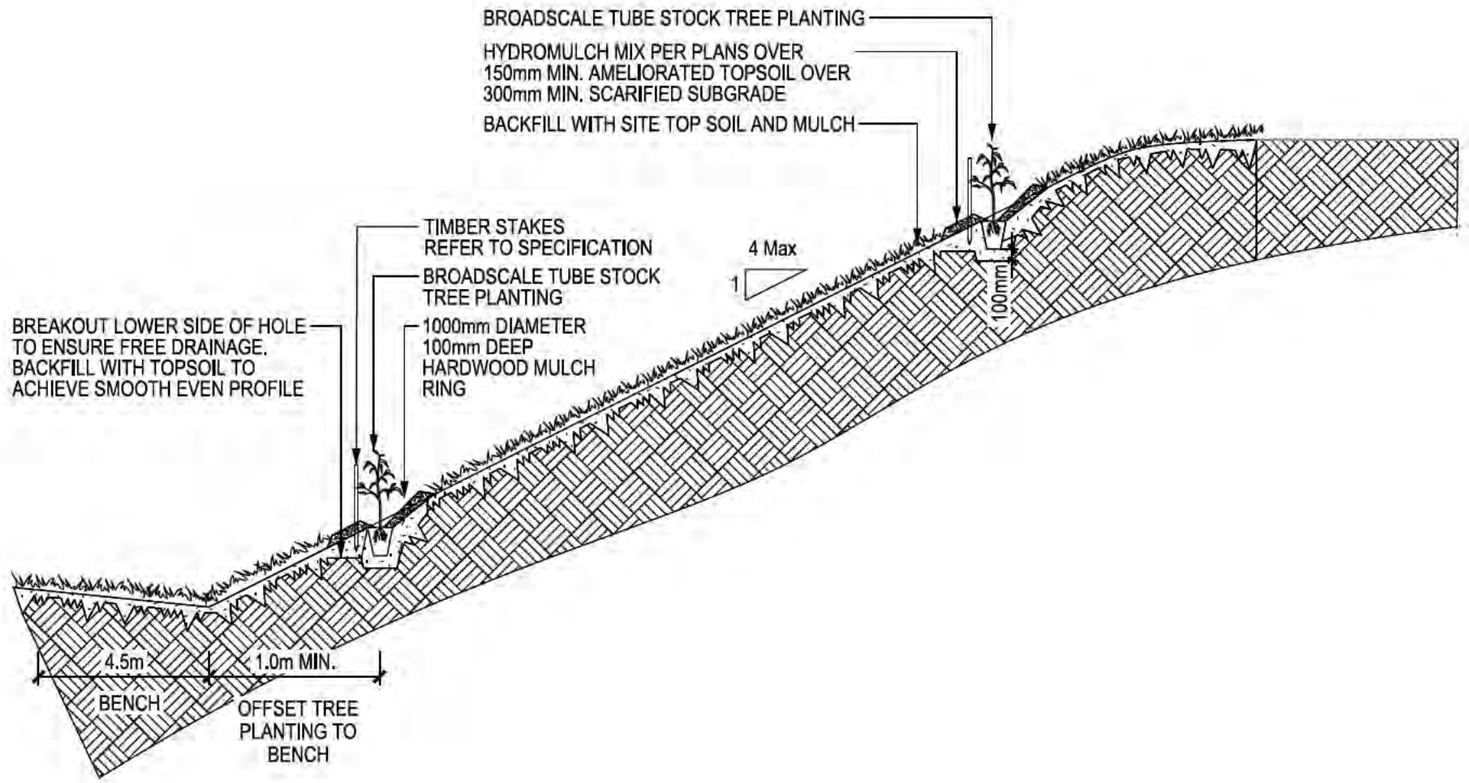
Title: MEDIAN PLANTING DETAIL
SHEET 2 OF 4
LANDSCAPE DESIGN

ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0202 Issue C

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0202.Dgn



1 BROADSCALE PLANTING DETAIL SECTION N.T.S.

Issue	Description	Date
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	NTS	Drawn MG	
Original Size	A3	Designed MN	
Height Datum	AHD	Checked ME	
Grid	MGA94 - 56	Approved DKI	
Filename:	MARW-TRA-LA-DD-DWG-0203.Dgn		

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

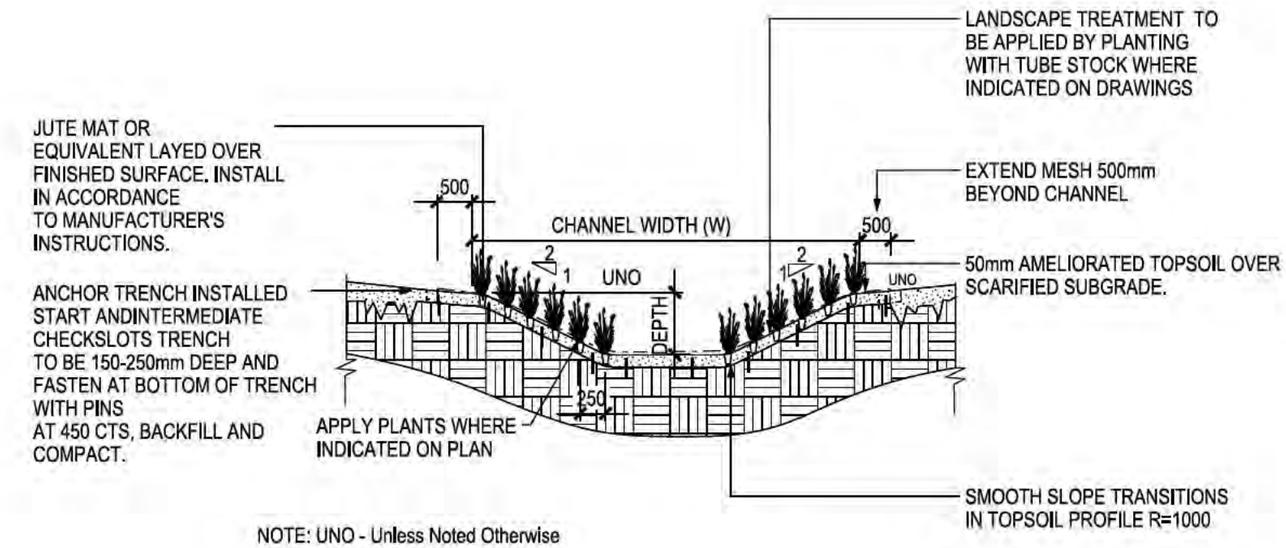
Title: BROADSCALE PLANTING DETAIL
SHEET 3 OF 4
LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0203 Issue C

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0203.Dgn



NOTE: UNO - Unless Noted Otherwise

1 TYPICAL DRAINAGE SECTION N.T.S.

Issue	Description	Date
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

Scales: NTS
Original Size: A3
Height Datum: AHD
Grid: MGA94 - 56
Filename: MARW-TRA-LA-DD-DWG-0204.Dgn

Current Issue Signatures
Drawn: MG
Designed: MN
Checked: ME
Approved: DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: TYPICAL DRAINAGE SHEET 4 OF 4 LANDSCAPE DESIGN

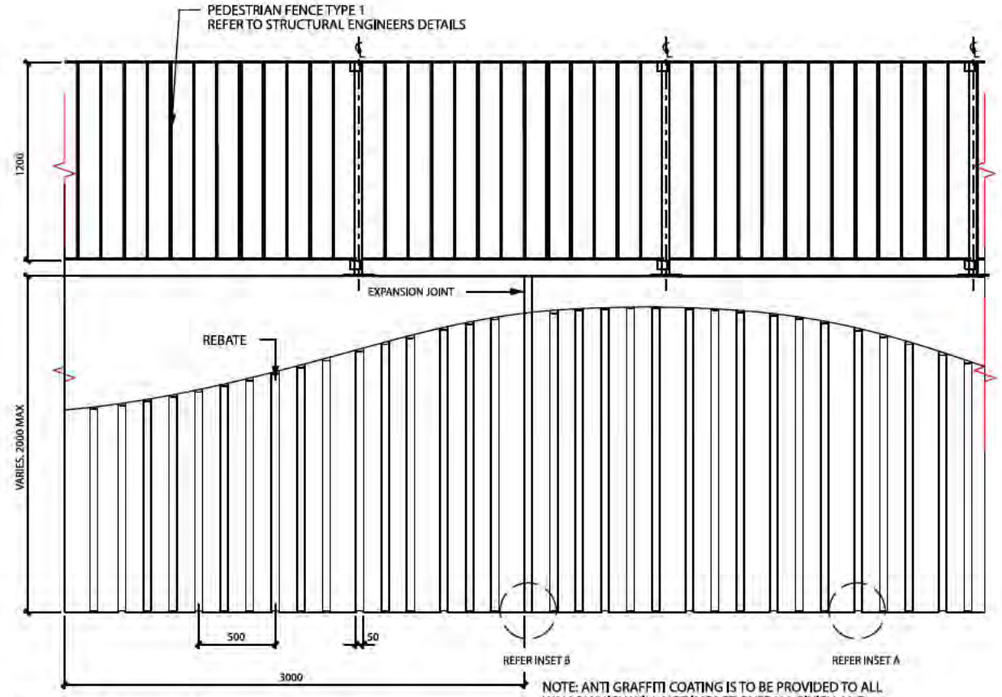
ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0204

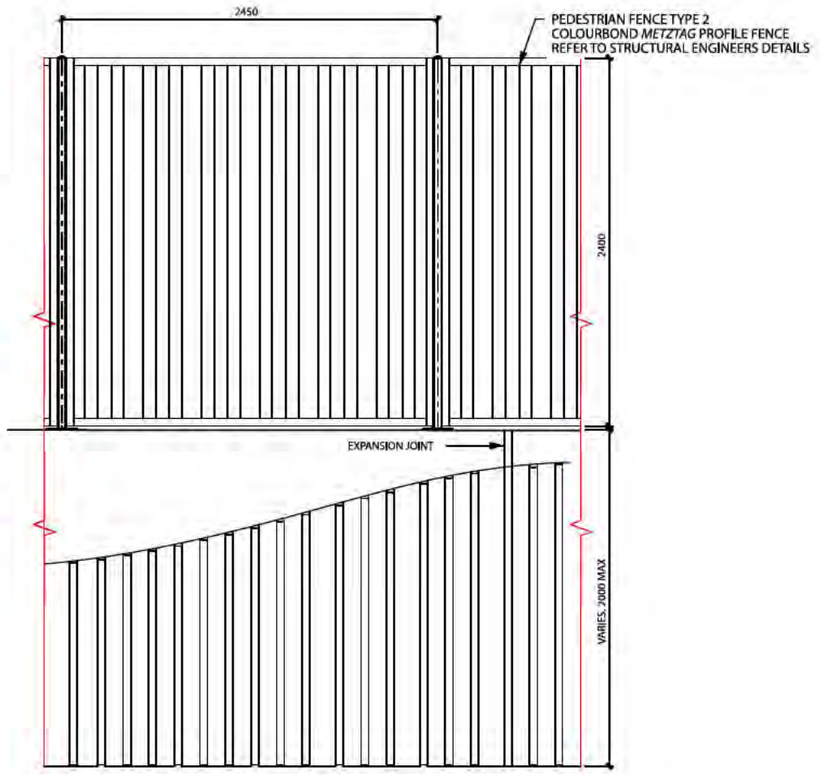
Issue C

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0204.Dgn



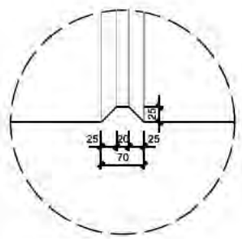
A) TYPE 1 RETAINING WALL

NOTE: ANTI GRAFFITI COATING IS TO BE PROVIDED TO ALL WALLS WHICH WILL NOT IMPACT OVERALL FINISH AND COLOUR OF SURFACE.

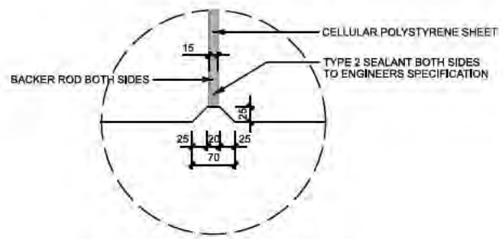


B) TYPE 2 RETAINING WALL & PEDESTRIAN FENCE

1 RETAINING WALL DETAILS
SECTION N.T.S.



A) REBATE



B) EXPANSION JOINT

2 JOINTS AND REBATES
SECTION N.T.S.

Issue	Description	Date
C	100% DETAILED DESIGN SUBMISSION	08.02.2024
B	ISSUED FOR 85% DETAILED DESIGN	28.08.2023
A	ISSUED FOR 80% DETAILED DESIGN	16.06.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	NTS	Drawn MG	
Original Size	A3	Designed MN	
Height Datum	AHD	Checked ME	
Grid	MGA94 - 56	Approved DKI	
Filename:	MARW-TRA-LA-DD-DWG-0210.Dgn		

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

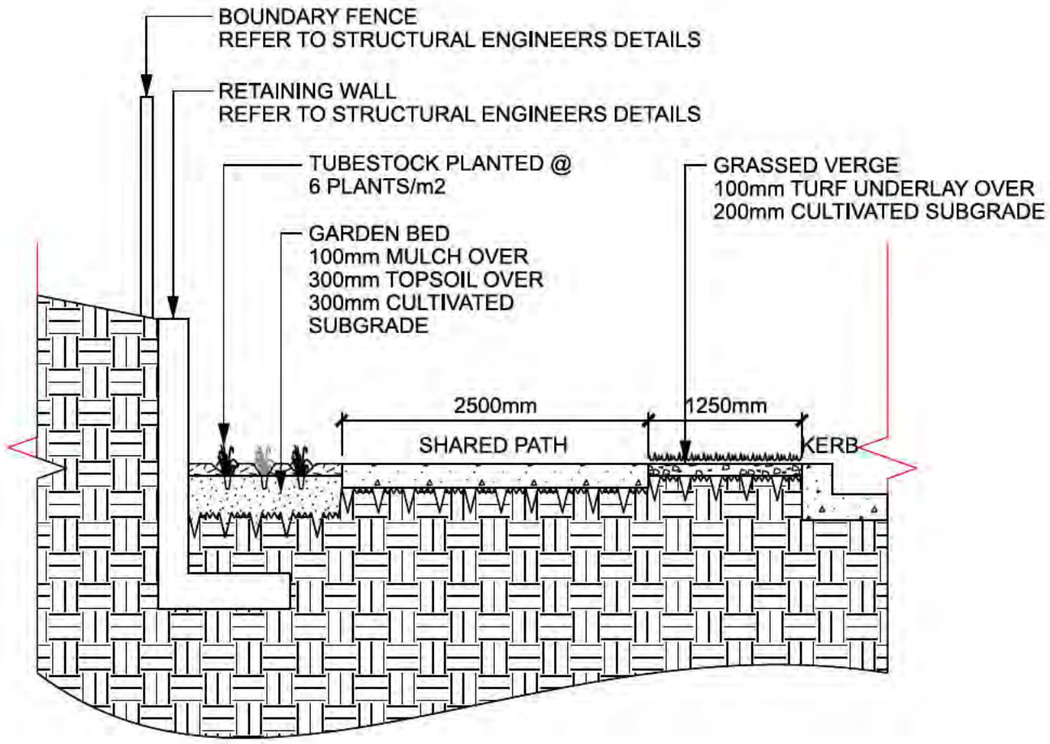
Title: TYPE 1 RETAINING WALL DETAIL SHEET 1 OF 4 LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0210 Issue C

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0210.Dgn



1 TYPE 2 RETAINING WALL DETAIL
SECTION N.T.S.

Issue	Description	Date
B	100% DETAILED DESIGN SUBMISSION	08.02.2024
A	ISSUED FOR 85% DETAILED DESIGN	28.08.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures
Scales	NTS	
Original Size	A3	Drawn MG
Height Datum	AHD	Designed MN
Grid	MGA94 - 56	Checked ME
Filename:	MARW-TRA-LA-DD-DWG-0211.Dgn	Approved DKI

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

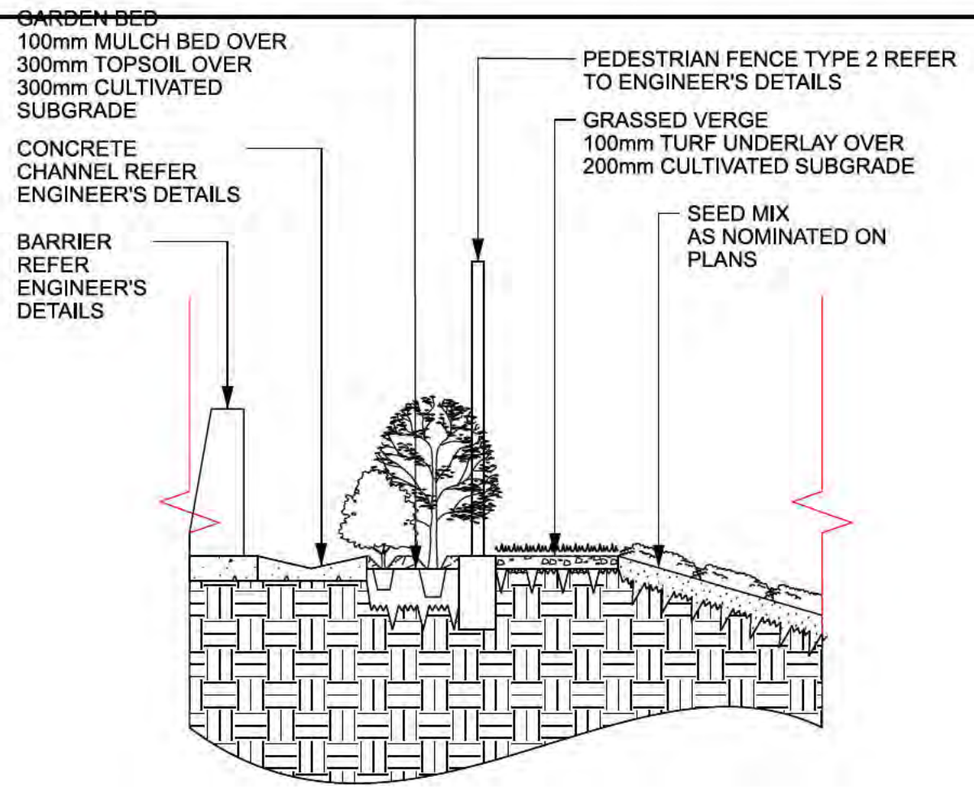
Title: TYPE 2 RETAINING WALL DETAIL
SHEET 2 OF 4
LANDSCAPE DESIGN

ARCADIS
Tract

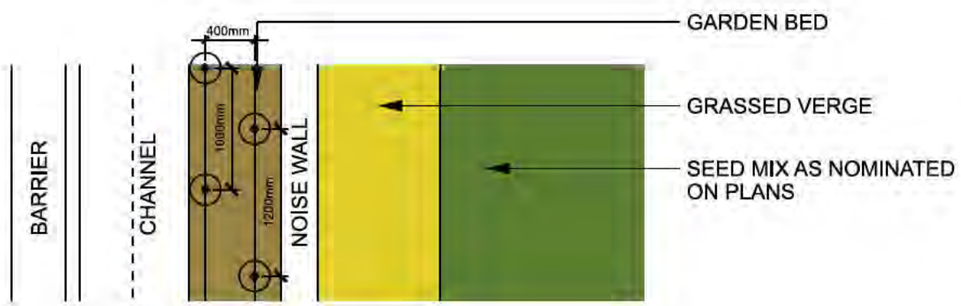
Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0211 Issue B

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0211.Dgn



1 PEDESTRIAN FENCE - TYPE 2 DETAIL
SECTION N.T.S.



2 PEDESTRIAN FENCE - TYPE 2 DETAIL
PLAN N.T.S.

Issue	Description	Date
B	100% DETAILED DESIGN SUBMISSION	08.02.2024
A	ISSUED FOR 85% DETAILED DESIGN	28.08.2023

50mm on Original

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures
Scales	NTS	Drawn MG
Original Size	A3	Designed MN
Height Datum	AHD	Checked ME
Grid	MGA94 - 56	Approved DKI
Filename:	MARW-TRA-LA-DD-DWG-0212.Dgn	

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

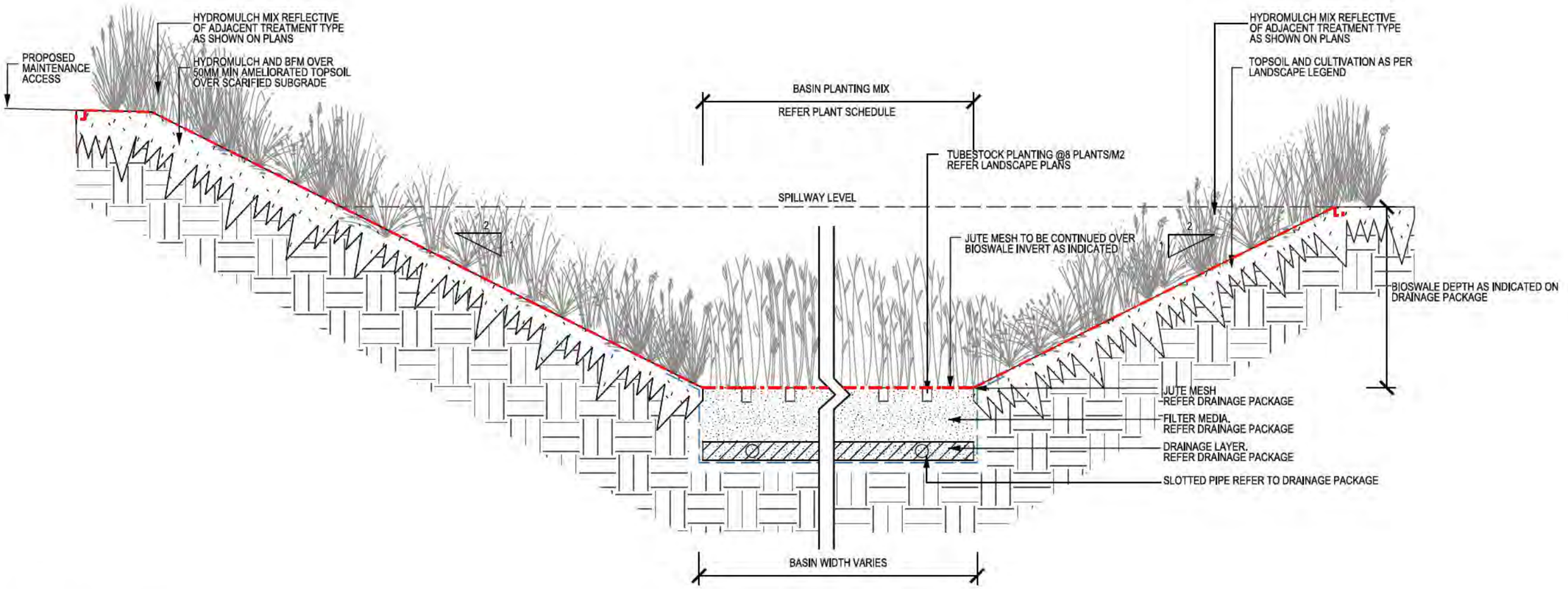
Title: NOISE WALL DETAIL
SHEET 3 OF 4
LANDSCAPE DESIGN

ARCADIS
Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0212 Issue B

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0212.Dgn



1 BIOFILTRATION BASIN DETAIL SECTION N.T.S.

Issue	Description	Date
A	100% DETAILED DESIGN SUBMISSION	08.02.2024

50mm on Original

0 20 40m
1 : 1000

Client: NATIONAL INTERMODAL

Status: DETAILED DESIGN
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	NTS	Drawn MG	
Original Size	A3	Designed MN	
Height Datum	AHD	Checked ME	
Grid	MGA94 - 56	Approved DKI	
Filename:	MARW-TRA-LA-DD-DWG-0213.Dgn		

Project: MOOREBANK AVENUE REALIGNMENT WORKS (MARW)

Title: BASIN DETAIL SHEET 4 OF 4 LANDSCAPE DESIGN

ARCADIS Tract

Project No. 30100351

Drawing No. MARW-TRA-LA-DD-DWG-0213 Issue A

Date Plotted: 7 Sep 2005 - 07:08PM File Name: \\Tract.Local\Tractfs\T_Drive\Projects\SYD\2023\223-0027-00 - Moorebank Avenue Realignment Works\L-01 - (Sub-Project Name)\DR-Drawing Set (100-999)\MARW-TRA-LA-DD-DWG-0213.Dgn

Appendix B Aboricultural Report

Arboricultural Report for Development

Site location:
Moorebank Avenue Realignment Works (MARW) Moorebank NSW

Prepared for:
Arcadis

Prepared by: [redacted]
Urban Arbor Pty Ltd
Ref: 231115_MARW_PAR

Date prepared: 15 November 2023

URBAN ARBOR
The Trusted Name in Tree Management

URBAN ARBOR
The Trusted Name in Tree Management

Table of Contents

URBAN ARBOR
The Trusted Name in Tree Management

1. INTRODUCTION

1.1 Urban Arbor have been instructed by Arcadis to complete a tree survey and arboricultural assessment to identify the number, type and location of trees to be removed that will be impacted by the proposed Moorebank Avenue Realignment Works (MARW). The selected locations where the tree survey was completed was determined by Arcadis.

1.2 This report is an arboricultural assessment and is not intended to be a comprehensive tree protection report or arboricultural impact assessment report in accordance with AS4970-2009.

1.3 A list of trees identified for removal has been included in section 6 of this report. This report does not provide approval for tree removal, all recommendations within this report are subject to the relevant authorities.

1.4 Below is a list of all documents and information provided to assist in preparing the report;

- Details Design Plans, Arcadis, Page 1, 2, 3 and 4, 24 August 2023.

1.5 The site and tree inspection was carried out on 26 October 2023 by Jack Williams of Urban Arbor. Access was available to the subject site and adjoining public areas only. All tree data contained in this report was collected during this site inspections. This report has been written by Bryce Claassens of Urban Arbor.

2. SCOPE OF THE REPORT

2.1 This report has been undertaken to meet the following objectives.

2.1.1 Conduct a visual assessment from ground level of significant trees located within selected areas at the site (identified by Arcadis). For the purpose of this report, a significant tree is a tree with a height equal to or greater than 3 metres with one or relatively few main stems.

2.1.2 Provide an indicative assessment of the potential impact the proposed development is likely to cause to the condition of the subject trees.

2.1.3 Provide general guidance in relation to protecting trees on developing sites in accordance with AS4970 Protection of trees on development sites (2009), including assistance in designing around trees selected to be retained.

URBAN ARBOR
The Trusted Name in Tree Management

3. LIMITATIONS

3.1 The observations and recommendations are based on the site inspections identified in section 1 only. The findings of this report are based on the observations and site conditions at the time of inspection.

3.2 The tree inspection was visual from ground level only. No soil or tissue testing was carried out as part of the tree inspection. None of the surrounding surfaces adjacent to trees were lifted or removed during the tree inspections.

3.3 Root decay can sometimes be present with no visual indication above ground. It is also impossible to know the extent of any root damage caused by mechanical damage such as underground root cutting during the installation of services without undertaking detailed root investigation. Any form of tree failure due to these activities is beyond the scope of this assessment.

3.4 Tree identification is based on accessible visual characteristics at the time of inspection. As key identifying features are not always available the accuracy of identification is not guaranteed. Where tree species is unknown, it is indicated with an *spp*.

3.5 All diagrams, plans and photographs included in this report are visual aids only and are not to scale unless otherwise indicated.

3.6 Alteration of this report invalidates the entire report.

4. METHODOLOGY

4.1 The following information was collected during the assessment of the subject tree(s).

4.1.1 Tree common name

4.1.2 Tree botanical name

4.1.3 DBH (Trunk/Stem diameter at breast height/1.4m) - millimetres.

4.1.4 Estimated height - metres

4.1.5 Estimated crown spread (diameter of crown) - metres

4.1.6 Easting and Northing

4.2 Tree diameter was measured using a DBH tape or in some cases estimated. Tree height and tree canopy spread was measured with a clinometer or in some cases estimated. All other measurements were estimations unless otherwise stated. The other tools I used during the assessment were a nylon mallet, compass, camera and a steel probe.

4.3 The Easting and Northing was captured using a Trimble DA2 GNSS device, and is only accurate to within 1 metre.

4.4 Details of how the observations in this report have been assessed are listed in the appendices.

URBAN ARBOR
The Trusted Name in Tree Management

5. SITE LOCATION AND BRIEF DESCRIPTION

5.1 The site is located in the suburb of Moorebank, New South Wales, which is located in the Liverpool City Council Local Government Area (LGA). All trees at the site are subject to protection under the Liverpool Local Environmental Plan (LEP) 2008[1] and Development Control Plan (DCP) 2008.[2] The site is not identified as a heritage item or located inside a heritage conservation area in the NSW Planning Portal Spatial Viewer heritage layer.[3] The site has been identified as containing biodiversity in the NSW Planning Portal Spatial Viewer biodiversity values map layer.[4]

5.2 **Site plans:** A Google Earth file (KMZ) accompanies this report which identifies the location of all trees included within this report. Tree numbers have been identified on the Google Earth file in the location of the captured Easting and Northing for each individual tree.

[1] *Liverpool Local Environmental Plan 2008*, https://www.legislation.nsw.gov.au/#/view/EPI/2008/403/whole, accessed 1 November 2023.

[2] *Liverpool Development Control Plan 2008*, https://www.liverpool.nsw.gov.au/development/liverpools-planning-controls/liverpool-development-control-plan, accessed 1 November 2023.

[3] *NSW Planning Portal Spatial Viewer – Heritage Layer,* https://www.planningportal.nsw.gov.au/spatialviewerhistoric/#/find-a-property/address, accessed 1 November 2023.

[4] *NSW Planning Portal Spatial Viewer – Biodiversity Values Map Layer,* https://www.planningportal.nsw.gov.au/spatialviewerhistoric/#/find-a-property/address, accessed 1 November 2023.

URBAN ARBOR
The Trusted Name in Tree Management

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 To determine which trees to include, a representative from Arcadis marked out each area on site. Urban Arbor then determined which vegetation within each area met the definition of a tree that needed to be identified and assessed in this report. For the purpose of this assessment and report, a significant tree is a tree with a height equal to or greater than 3 metres with one or relatively few main stems.

6.2 All trees included within the report will be located within the footprint of the proposed Moorebank Avenue Realignment Works and are required to be removed to accommodate the development. This report does not provide approval for tree removal, all recommendations within this report are subject to the relevant authorities.

6.3 **Table 2:** In the table below the tree information has been summarised and the indicative impact of the proposed development has been assessed for all trees included in the report.

Tree ID	Tree Species	Height (m)	Canopy Spread Radius (m)	Impact	Recommendation
1	*Acacia parramattensis*	5	1	Footprint	Remove
2	*Melaleuca linariifolia*	3	1	Footprint	Remove
3	*Acacia parramattensis*	4	1	Footprint	Remove
4	*Acacia falcata*	4	1	Footprint	Remove
5	*Acacia parramattensis*	6	1	Footprint	Remove
6	*Acacia parramattensis*	5	1	Footprint	Remove
7	*Acacia parramattensis*	4	1	Footprint	Remove
8	*Acacia parramattensis*	4	1	Footprint	Remove
9	*Eucalyptus parramattensis*	3	1	Footprint	Remove
10	*Acacia parramattensis*	4	1	Footprint	Remove
11	*Eucalyptus parramattensis*	5	1	Footprint	Remove
12	*Eucalyptus parramattensis*	4	1	Footprint	Remove
13	*Acacia parramattensis*	4	1	Footprint	Remove
15	*Acacia parramattensis*	5	1	Footprint	Remove
16	*Acacia parramattensis*	5	1	Footprint	Remove
17	*Acacia parramattensis*	5	1	Footprint	Remove
19	*Acacia parramattensis*	4	1	Footprint	Remove
20	*Acacia parramattensis*	5	1	Footprint	Remove
21	*Melaleuca linariifolia*	4	2	Footprint	Remove
22	*Acacia parramattensis*	5	1	Footprint	Remove
23	*Angophora bakeri*	5	1	Footprint	Remove
24	*Acacia parramattensis*	6	1	Footprint	Remove
25	*Acacia parramattensis*	5	1	Footprint	Remove
26	*Angophora bakeri*	4	1	Footprint	Remove
27	*Angophora bakeri*	4	1	Footprint	Remove
28	*Angophora bakeri*	4	1	Footprint	Remove

URBAN ARBOR
The Trusted Name in Tree Management

Tree ID	Tree Species	Height (m)	Canopy Spread Radius (m)	Impact	Recommendation
29	*Angophora bakeri*	4	1	Footprint	Remove
30	*Angophora floribunda*	7	2	Footprint	Remove
31	*Acacia parramattensis*	4	1	Footprint	Remove
32	*Angophora bakeri*	5	2	Footprint	Remove
33	*Acacia parramattensis*	4	1	Footprint	Remove
34	*Casuarina cunninghamiana*	4	1	Footprint	Remove
35	*Melaleuca linariifolia*	3	1	Footprint	Remove
36	*Acacia parramattensis*	4	1	Footprint	Remove
37	*Acacia parramattensis*	5	1	Footprint	Remove
38	*Acacia parramattensis*	5	1	Footprint	Remove
39	*Acacia parramattensis*	3	1	Footprint	Remove
40	*Acacia parramattensis*	4	1	Footprint	Remove
41	*Acacia parramattensis*	4	1	Footprint	Remove
42	*Acacia parramattensis*	4	1	Footprint	Remove
43	*Acacia parramattensis*	5	1	Footprint	Remove
44	*Acacia parramattensis*	3	1	Footprint	Remove
45	*Acacia parramattensis*	4	1	Footprint	Remove
46	*Acacia parramattensis*	3	1	Footprint	Remove
47	*Acacia parramattensis*	5	1	Footprint	Remove
48	*Angophora bakeri*	6	1	Footprint	Remove
49	*Angophora bakeri*	5	1	Footprint	Remove
50	*Angophora bakeri*	5	1	Footprint	Remove
51	*Angophora bakeri*	5	1	Footprint	Remove
52	*Angophora bakeri*	5	1	Footprint	Remove
53	*Angophora bakeri*	3	1	Footprint	Remove
54	*Angophora bakeri*	5	1	Footprint	Remove
55	*Angophora bakeri*	4	1	Footprint	Remove
56	*Angophora bakeri*	4	1	Footprint	Remove
60	*Melaleuca linariifolia*	4	2	Footprint	Remove
61	*Acacia falcata*	4	2	Footprint	Remove
62	*Acacia falcata*	4	1	Footprint	Remove
63	*Eucalyptus racemosa subsp. racemosa*	6	1	Footprint	Remove
64	*Acacia falcata*	4	2	Footprint	Remove
65	*Angophora bakeri*	4	2	Footprint	Remove
66	*Angophora bakeri*	4	1	Footprint	Remove
67	*Angophora bakeri*	5	1	Footprint	Remove
68	*Angophora bakeri*	4	2	Footprint	Remove
69	*Angophora bakeri*	6	1	Footprint	Remove
70	*Angophora bakeri*	5	2	Footprint	Remove
71	*Angophora bakeri*	4	1	Footprint	Remove
72	*Angophora bakeri*	4	1	Footprint	Remove
73	*Melaleuca linariifolia*	4	1	Footprint	Remove
74	*Eucalyptus racemosa subsp. racemosa*	7	1	Footprint	Remove

URBAN ARBOR
The Trusted Name in Tree Management

Tree ID	Tree Species	Height (m)	Canopy Spread Radius (m)	Impact	Recommendation
75	*Eucalyptus racemosa subsp. racemosa*	6	1	Footprint	Remove
76	*Eucalyptus racemosa subsp. racemosa*	6	3	Footprint	Remove
77	*Melaleuca linariifolia*	4	1	Footprint	Remove
78	*Leptospermum trinervium*	4	2	Footprint	Remove
79	*Angophora bakeri*	5	1	Footprint	Remove
80	*Eucalyptus racemosa subsp. racemosa*	5	2	Footprint	Remove
81	*Eucalyptus parramattensis*	4	1	Footprint	Remove
82	*Eucalyptus racemosa subsp. racemosa*	4	1	Footprint	Remove
83	*Eucalyptus racemosa subsp. racemosa*	5	2	Footprint	Remove
84	*Eucalyptus racemosa subsp. racemosa*	7	3	Footprint	Remove
85	*Eucalyptus racemosa subsp. racemosa*	7	1	Footprint	Remove
86	*Melaleuca decora*	4	1	Footprint	Remove
87	*Eucalyptus racemosa subsp. racemosa*	3	1	Footprint	Remove
88	*Eucalyptus racemosa subsp. racemosa*	5	1	Footprint	Remove
89	*Eucalyptus racemosa subsp. racemosa*	5	1	Footprint	Remove
90	*Eucalyptus parramattensis*	3	1	Footprint	Remove
91	*Angophora bakeri*	4	1	Footprint	Remove
92	*Angophora bakeri*	4	1	Footprint	Remove
93	*Angophora bakeri*	4	1	Footprint	Remove
94	*Angophora bakeri*	4	1	Footprint	Remove
95	*Angophora bakeri*	4	1	Footprint	Remove
96	*Casuarina glauca*	5	2	Footprint	Remove
97	*Angophora bakeri*	4	1	Footprint	Remove
98	*Angophora bakeri*	5	1	Footprint	Remove
99	*Angophora bakeri*	4	1	Footprint	Remove
100	*Eucalyptus paniculata*	6	3	Footprint	Remove
101	*Casuarina glauca*	4	2	Footprint	Remove
102	*Acacia parramattensis*	4	3	Footprint	Remove
103	*Acacia parramattensis*	4	3	Footprint	Remove
104	*Eucalyptus moluccana*	5	2	Footprint	Remove
105	*Eucalyptus moluccana*	4	1	Footprint	Remove
106	*Eucalyptus spp*	4	2	Footprint	Remove
107	*Eucalyptus spp*	4	1	Footprint	Remove
108	*Eucalyptus spp*	4	1	Footprint	Remove
109	*Eucalyptus moluccana*	6	2	Footprint	Remove
110	*Eucalyptus moluccana*	4	1	Footprint	Remove

URBAN ARBOR
The Trusted Name in Tree Management

Tree ID	Tree Species	Height (m)	Canopy Spread Radius (m)	Impact	Recommendation
111	*Eucalyptus moluccana*	7	3	Footprint	Remove
112	*Eucalyptus spp*	6	2	Footprint	Remove
113	*Eucalyptus moluccana*	4	1	Footprint	Remove
114	*Eucalyptus moluccana*	3	60	Footprint	Remove
115	*Eucalyptus moluccana*	4	1	Footprint	Remove
116	*Eucalyptus moluccana*	6	1	Footprint	Remove
117	*Eucalyptus moluccana*	5	1	Footprint	Remove
118	*Acacia parramattensis*	4	1	Footprint	Remove
119	*Eucalyptus moluccana*	6	1	Footprint	Remove
120	*Eucalyptus moluccana*	4	1	Footprint	Remove
120a	*Eucalyptus moluccana*	5	1	Footprint	Remove
121	*Eucalyptus spp*	5	1	Footprint	Remove
122	*Eucalyptus spp*	4	1	Footprint	Remove
123	*Eucalyptus moluccana*	4	1	Footprint	Remove
124	*Eucalyptus microcorys*	12	6	Footprint	Remove
125	*Eucalyptus moluccana*	6	2	Footprint	Remove
126	*Acacia parramattensis*	4	2	Footprint	Remove
127	*Acacia parramattensis*	3	2	Footprint	Remove
128	*Eucalyptus racemosa subsp. racemosa*	6	3	Footprint	Remove
129	*Eucalyptus racemosa subsp. racemosa*	6	3	Footprint	Remove
130	*Eucalyptus spp*	4	1	Footprint	Remove
131	*Eucalyptus spp*	4	1	Footprint	Remove
132	*Acacia parramattensis*	6	2	Footprint	Remove
133	*Acacia parramattensis*	6	1	Footprint	Remove
134	*Acacia parramattensis*	4	1	Footprint	Remove
135	*Acacia parramattensis*	6	1	Footprint	Remove
136	*Acacia parramattensis*	5	1	Footprint	Remove
137	*Acacia parramattensis*	5	1	Footprint	Remove
138	*Acacia parramattensis*	5	1	Footprint	Remove
139	*Acacia parramattensis*	6	1	Footprint	Remove
140	*Acacia parramattensis*	6	1	Footprint	Remove
141	*Acacia parramattensis*	6	1	Footprint	Remove
142	*Acacia parramattensis*	6	1	Footprint	Remove
143	*Acacia parramattensis*	6	1	Footprint	Remove
145	*Acacia parramattensis*	6	1	Footprint	Remove
146	*Acacia parramattensis*	6	1	Footprint	Remove
147	*Acacia parramattensis*	5	1	Footprint	Remove
148	*Acacia parramattensis*	7	1	Footprint	Remove
149	*Acacia parramattensis*	7	1	Footprint	Remove
150	*Acacia parramattensis*	6	3	Footprint	Remove
151	*Acacia parramattensis*	5	1	Footprint	Remove
152	*Angophora bakeri*	7	3	Footprint	Remove
153	*Angophora bakeri*	10	5	Footprint	Remove

URBAN ARBOR
The Trusted Name in Tree Management

Tree ID	Tree Species	Height (m)	Canopy Spread Radius (m)	Impact	Recommendation
154	*Angophora bakeri*	12	3	Footprint	Remove
155	*Angophora bakeri*	5	2	Footprint	Remove
156	*Angophora bakeri*	10	3	Footprint	Remove
157	*Angophora bakeri*	7	1	Footprint	Remove
158	*Angophora bakeri*	6	1	Footprint	Remove
159	*Lophostemon confertus*	5	2	Footprint	Remove
160	*Acacia parramattensis*	6	3	Footprint	Remove
161	*Acacia parramattensis*	6	2	Footprint	Remove
162	*Eucalyptus tereticornis*	20	8	Footprint	Remove
163	*Eucalyptus tereticornis*	20	8	Footprint	Remove
164	*Eucalyptus tereticornis*	20	8	Footprint	Remove

6.4 **Tree work:** All tree work should be carried out by a qualified and experienced Arborist with a minimum of AQF level 3 in arboriculture, in accordance with NSW Work Cover Code of Practice for the Amenity Tree Industry (1998) and AS4373 Pruning of amenity trees (2007).

URBAN ARBOR
The Trusted Name in Tree Management

7. BIBLIOGRAPHY/REFERENCES

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URBAN ARBOR
The Trusted Name in Tree Management

8. LIST OF APPENDICES

The following are included in the appendices:

- Appendix 1 - Tree Inspection Schedule

Report prepared by:

Bryce Claassens
Diploma of Arboriculture (AQF5)
Cert III Landscape Construction
Member Arboriculture Australia
Quantified Tree Risk Assessment (QTRA)
ISA Tree Risk Assessment Qualification (TRAQ)

Site inspection completed by:

Jack Williams
Diploma of Arboriculture (AQF5)
FdSc Arboriculture
Registered Consulting Arborist No. 2556
ISA Member No. 228863

Appendix 1 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Height (m)	Canopy Spread Radius (m)	Stem 1 mm	Stem 2 mm	Stem 3 mm	Stem 4 mm	Stem 5 mm	Stem 6 mm	Easting	Northing
1	Parramatta Wattle	*Acacia parramattensis*	5	1	50						308564.9822	6240292.327
2	Snow-in-summer	*Melaleuca linariifolia*	3	1	70						308562.5704	6240292.662
3	Parramatta Wattle	*Acacia parramattensis*	4	1	40						308563.1279	6240290.639
4	Sickle Wattle	*Acacia falcata*	4	1	60						308564.3727	6240290.851
5	Parramatta Wattle	*Acacia parramattensis*	6	1	70						308563.3306	6240286.838
6	Parramatta Wattle	*Acacia parramattensis*	5	1	70						308560.7226	6240284.898
7	Parramatta Wattle	*Acacia parramattensis*	4	1	40						308558.2764	6240280.666
8	Parramatta Wattle	*Acacia parramattensis*	4	1	30						308558.6418	6240277.745
9	Parramatta Red Gum	*Eucalyptus parramattensis*	3	1	60						308559.8307	6240278.996
10	Parramatta Wattle	*Acacia parramattensis*	4	1	40	40	30				308559.9338	6240278.107
11	Parramatta Red Gum	*Eucalyptus parramattensis*	5	1	120	120					308561.1735	6240277.828
12	Parramatta Red Gum	*Eucalyptus parramattensis*	4	1	70						308562.4648	6240276.643
13	Parramatta Wattle	*Acacia parramattensis*	4	1	30						308562.3331	6240275.676
15	Parramatta Wattle	*Acacia parramattensis*	5	1	20	30					308560.663	6240274.95
16	Parramatta Wattle	*Acacia parramattensis*	5	1	40						308560.4234	6240275.442
17	Parramatta Wattle	*Acacia parramattensis*	5	1	30	30	30	20			308560.5181	6240275.128
19	Parramatta Wattle	*Acacia parramattensis*	4	1	40						308561.4686	6240271.218
20	Parramatta Wattle	*Acacia parramattensis*	5	1	50						308561.584	6240271.286
21	Snow-in-summer	*Melaleuca linariifolia*	4	2	59	60	40				308560.3788	6240268.36
22	Parramatta Wattle	*Acacia parramattensis*	5	1	50						308554.3744	6240273.8
23	Narrow-leaved Apple	*Angophora bakeri*	5	1	70	60	20				308554.2486	6240268.161
24	Parramatta Wattle	*Acacia parramattensis*	6	1	60						308553.3045	6240263.876
25	Parramatta Wattle	*Acacia parramattensis*	5	1	50						308553.323	6240260.642

Appendix 1 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Height (m)	Canopy Spread Radius (m)	Stem 1 mm	Stem 2 mm	Stem 3 mm	Stem 4 mm	Stem 5 mm	Stem 6 mm	Easting	Northing
26	Narrow-leaved Apple	*Angophora bakeri*	4	1	80						308551.6474	6240252.191
27	Narrow-leaved Apple	*Angophora bakeri*	4	1	40	60	50				308550.5158	6240243.085
28	Narrow-leaved Apple	*Angophora bakeri*	4	1	60	40					308550.5596	6240241.355
29	Narrow-leaved Apple	*Angophora bakeri*	4	1	60	50	50				308545.2652	6240229.749
30	Rough-barked Apple	*Angophora floribunda*	7	2	170	140					308543.1976	6240220.647
31	Parramatta Wattle	*Acacia parramattensis*	4	1	40	40					308541.7215	6240209.948
32	Narrow-leaved Apple	*Angophora bakeri*	5	2	110	140	100	60	60	50	308575.2101	6240358.217
33	Parramatta Wattle	*Acacia parramattensis*	4	1	50						308563.7635	6240371.281
34	River Sheoak	*Casuarina cunninghamiana*	4	1	30						308558.9358	6240332.761
35	Snow-in-summer	*Melaleuca linariifolia*	3	1	60	50					308600.9002	6240519.849
36	Parramatta Wattle	*Acacia parramattensis*	4	1	40						308595.7587	6240504.618
37	Parramatta Wattle	*Acacia parramattensis*	5	1	70						308596.2188	6240495.432
38	Parramatta Wattle	*Acacia parramattensis*	5	1	70						308595.1739	6240492.182
39	Parramatta Wattle	*Acacia parramattensis*	3	1	40						308592.7908	6240488.873
40	Parramatta Wattle	*Acacia parramattensis*	4	1	30						308595.3278	6240484.311
41	Parramatta Wattle	*Acacia parramattensis*	4	1	50						308594.6405	6240478.987
42	Parramatta Wattle	*Acacia parramattensis*	4	1	50						308593.3655	6240475.414
43	Parramatta Wattle	*Acacia parramattensis*	5	1	60						308586.8425	6240460.772
44	Parramatta Wattle	*Acacia parramattensis*	3	1	60						308585.7636	6240460.191
45	Parramatta Wattle	*Acacia parramattensis*	4	1	30	40					308582.4796	6240450.256
46	Parramatta Wattle	*Acacia parramattensis*	3	1	20						308583.4527	6240449.543
47	Parramatta Wattle	*Acacia parramattensis*	5	1	60						308583.9839	6240447.749
48	Narrow-leaved Apple	*Angophora bakeri*	6	1	130	120	90				308583.1379	6240446.832
49	Narrow-leaved Apple	*Angophora bakeri*	5	1	100	100	90				308581.9417	6240445.215
50	Narrow-leaved Apple	*Angophora bakeri*	5	1	120	120	100				308582.3562	6240439.781
51	Narrow-leaved Apple	*Angophora bakeri*	5	1	50						308584.9499	6240437.014

Appendix 1 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Height (m)	Canopy Spread Radius (m)	Stem 1 mm	Stem 2 mm	Stem 3 mm	Stem 4 mm	Stem 5 mm	Stem 6 mm	Easting	Northing
52	Narrow-leaved Apple	*Angophora bakeri*	5	1	60	50					308585.3512	6240435.814
53	Narrow-leaved Apple	*Angophora bakeri*	3	1	50						308584.8387	6240433.712
54	Narrow-leaved Apple	*Angophora bakeri*	5	1	120						308584.7278	6240432.489
55	Narrow-leaved Apple	*Angophora bakeri*	4	1	50	40	50				308582.6474	6240434.15
56	Narrow-leaved Apple	*Angophora bakeri*	4	1	50	60					308581.9504	6240419.314
60	Snow-in-summer	*Melaleuca linariifolia*	4	2	180						308248.2064	6240210.742
61	Sickle Wattle	*Acacia falcata*	4	2	70						308244.6108	6240210.522
62	Sickle Wattle	*Acacia falcata*	4	1	40						308245.9814	6240207.068
63	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	6	1	230						308243.4239	6240200.675
64	Sickle Wattle	*Acacia falcata*	4	2	40	50					308249.9961	6240205.551
65	Narrow-leaved Apple	*Angophora bakeri*	4	2	110	100					308241.1756	6240180.687
66	Narrow-leaved Apple	*Angophora bakeri*	4	1	70						308235.4349	6240173.007
67	Narrow-leaved Apple	*Angophora bakeri*	5	1	60	100					308237.8815	6240173.001
68	Narrow-leaved Apple	*Angophora bakeri*	4	2	60	100					308238.8945	6240172.585
69	Narrow-leaved Apple	*Angophora bakeri*	6	1	120						308238.1203	6240170.266
70	Narrow-leaved Apple	*Angophora bakeri*	5	2	140	150					308237.7035	6240169.375
71	Narrow-leaved Apple	*Angophora bakeri*	4	1	90						308239.4845	6240168.18
72	Narrow-leaved Apple	*Angophora bakeri*	4	1	80						308242.1794	6240163.193
73	Snow-in-summer	*Melaleuca linariifolia*	4	1	120						308239.3173	6240153.193
74	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	7	1	100						308237.0789	6240152.979
75	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	6	1	110						308236.7669	6240152.031
76	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	6	3	140	90	60				308235.0812	6240151.793
77	Snow-in-summer	*Melaleuca linariifolia*	4	1	80	60					308238.0852	6240148.574
78	Flaky-barked Tea-tree	*Leptospermum trinervium*	4	2	40	60					308234.208	6240143.359
79	Narrow-leaved Apple	*Angophora bakeri*	5	1	130						308234.3652	6240141.58
80	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	5	2	70	100	100				308232.9681	6240137.244
81	Parramatta Red Gum	*Eucalyptus parramattensis*	4	1	120						308235.1976	6240135.984

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Tree ID	Common Name	Botanical Name	Height (m)	Canopy Spread Radius (m)	Stem 1 mm	Stem 2 mm	Stem 3 mm	Stem 4 mm	Stem 5 mm	Stem 6 mm	Easting	Northing
82	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	4	1	60						308234.1257	6240132.386
83	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	5	2	160	30					308231.8985	6240125.216
84	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	7	3	150	140					308230.9318	6240123.709
85	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	7	1	150						308233.1223	6240120.112
86	White Feather Honeymyrtle	*Melaleuca decora*	4	1	120						308233.2107	6240111.634
87	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	3	1	60	30					308216.6488	6240105.454
88	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	5	1	150						308218.1689	6240124.964
89	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	5	1	150						308216.6871	6240126.754
90	Parramatta Red Gum	*Eucalyptus parramattensis*	3	1	70						308217.6501	6240127.728
91	Narrow-leaved Apple	*Angophora bakeri*	4	1	100						308584.0495	6240444.793
92	Narrow-leaved Apple	*Angophora bakeri*	4	1	80	40					308583.2634	6240445.877
93	Narrow-leaved Apple	*Angophora bakeri*	4	1	70						308582.0414	6240445.72
94	Narrow-leaved Apple	*Angophora bakeri*	4	1	60	60	40				308582.4974	6240446.766
95	Narrow-leaved Apple	*Angophora bakeri*	4	1	60						308584.3993	6240447.598
96	Swamp Sheoak	*Casuarina glauca*	5	2	70	70	60	50			308584.1676	6240448.718
97	Narrow-leaved Apple	*Angophora bakeri*	4	1	50	60					308584.7745	6240447.274
98	Narrow-leaved Apple	*Angophora bakeri*	5	1	80						308584.9393	6240455.139
99	Narrow-leaved Apple	*Angophora bakeri*	4	1	60						308584.8919	6240454.154
100	Grey Ironbark	*Eucalyptus paniculata*	6	3	140	60					308507.0143	6241742.147
101	Swamp Sheoak	*Casuarina glauca*	4	2	60	20	30				308528.1022	6241734.85
102	Parramatta Wattle	*Acacia parramattensis*	4	3	140	100					308708.9522	6241628.054
103	Parramatta Wattle	*Acacia parramattensis*	4	3	110	120	110				308708.3403	6241611.292
104	Grey Box	*Eucalyptus moluccana*	5	2	120						308709.6647	6241599.327
105	Grey Box	*Eucalyptus moluccana*	4	1	60	40					308703.3702	6241582.752
106	Eucalypt	*Eucalyptus spp*	4	2	120						308707.0664	6241582.789
107	Eucalypt	*Eucalyptus spp*	4	1	110						308705.9941	6241578.228
108	Eucalypt	*Eucalyptus spp*	4	1	90						308706.7146	6241574.229

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Tree ID	Common Name	Botanical Name	Height (m)	Canopy Spread Radius (m)	Stem 1 mm	Stem 2 mm	Stem 3 mm	Stem 4 mm	Stem 5 mm	Stem 6 mm	Easting	Northing
109	Grey Box	*Eucalyptus moluccana*	6	2	120						308705.9637	6241570.309
110	Grey Box	*Eucalyptus moluccana*	4	1	70						308705.7961	6241567.185
111	Grey Box	*Eucalyptus moluccana*	7	3	190						308706.5383	6241565.866
112	Eucalypt	*Eucalyptus spp*	6	2	110						308705.9354	6241563.291
113	Grey Box	*Eucalyptus moluccana*	4	1	100						308703.5341	6241561.711
114	Grey Box	*Eucalyptus moluccana*	3	60	1						308703.3138	6241562.187
115	Grey Box	*Eucalyptus moluccana*	4	1	80						308704.2011	6241562.466
116	Grey Box	*Eucalyptus moluccana*	6	1	120						308704.7827	6241564.4
117	Grey Box	*Eucalyptus moluccana*	5	1	90						308702.89	6241564.646
118	Parramatta Wattle	*Acacia parramattensis*	4	1	200						308703.4066	6241565.739
119	Grey Box	*Eucalyptus moluccana*	6	1	80	70					308702.6532	6241566.69
120	Grey Box	*Eucalyptus moluccana*	4	1	40						308704.1497	6241568.343
120a	Grey Box	*Eucalyptus moluccana*	5	1	70						308702.8147	6241567.465
121	Eucalypt	*Eucalyptus spp*	5	1	100						308703.7825	6241569.414
122	Eucalypt	*Eucalyptus spp*	4	1	40						308703.4066	6241569.873
123	Grey Box	*Eucalyptus moluccana*	4	1	50						308703.4869	6241570.635
124	Tallowwood	*Eucalyptus microcorys*	12	6	45						308690.4597	6241574.572
125	Grey Box	*Eucalyptus moluccana*	6	2	180						308718.7638	6241684.287
126	Parramatta Wattle	*Acacia parramattensis*	4	2	100						308686.7237	6241576.052
127	Parramatta Wattle	*Acacia parramattensis*	3	2	100						308677.0785	6241376.713
128	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	6	3	240						308463.8504	6241659.237
129	Narrow-leaved Scribbly Gum	*Eucalyptus racemosa subsp. racemosa*	6	3	370						308470.9221	6241657.997
130	Eucalypt	*Eucalyptus spp*	4	1	100						308436.5311	6241703.529
131	Eucalypt	*Eucalyptus spp*	4	1	70						308422.0186	6241693.07
132	Parramatta Wattle	*Acacia parramattensis*	6	2	200						307951.4069	6239900.179
133	Parramatta Wattle	*Acacia parramattensis*	6	1	110						307950.995	6239904.561
134	Parramatta Wattle	*Acacia parramattensis*	4	1	40						307950.8694	6239904.389

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Tree ID	Common Name	Botanical Name	Height (m)	Canopy Spread Radius (m)	Stem 1 mm	Stem 2 mm	Stem 3 mm	Stem 4 mm	Stem 5 mm	Stem 6 mm	Easting	Northing
135	Parramatta Wattle	*Acacia parramattensis*	6	1	80						307950.4555	6239906.444
136	Parramatta Wattle	*Acacia parramattensis*	5	1	70						307949.8982	6239906.84
137	Parramatta Wattle	*Acacia parramattensis*	5	1	70						307950.6269	6239907.452
138	Parramatta Wattle	*Acacia parramattensis*	5	1	50						307951.0663	6239908.179
139	Parramatta Wattle	*Acacia parramattensis*	6	1	60						307951.2057	6239908.102
140	Parramatta Wattle	*Acacia parramattensis*	6	1	70						307952.0941	6239909.107
141	Parramatta Wattle	*Acacia parramattensis*	6	1	70						307951.7358	6239907.796
142	Parramatta Wattle	*Acacia parramattensis*	6	1	70						307951.1399	6239910.89
143	Parramatta Wattle	*Acacia parramattensis*	6	1	50						307949.9252	6239910.703
145	Parramatta Wattle	*Acacia parramattensis*	6	1	60						307949.5132	6239909.312
146	Parramatta Wattle	*Acacia parramattensis*	6	1	50						307948.8061	6239908.976
147	Parramatta Wattle	*Acacia parramattensis*	5	1	60						307949.1738	6239909.513
148	Parramatta Wattle	*Acacia parramattensis*	7	1	80						307947.5279	6239910.358
149	Parramatta Wattle	*Acacia parramattensis*	7	1	80						307948.3379	6239910.518
150	Parramatta Wattle	*Acacia parramattensis*	6	3	160						307946.889	6239909.905
151	Parramatta Wattle	*Acacia parramattensis*	5	1	90						307945.1186	6239907.43
152	Narrow-leaved Apple	*Angophora bakeri*	7	3	250						307943.2823	6239781.781
153	Narrow-leaved Apple	*Angophora bakeri*	10	5	300	400					307947.6548	6239790.883
154	Narrow-leaved Apple	*Angophora bakeri*	12	3	230						307952.6007	6239791.26
155	Narrow-leaved Apple	*Angophora bakeri*	5	2	80	100	100				307951.8823	6239788.455
156	Narrow-leaved Apple	*Angophora bakeri*	10	3	250	80	70				307954.1152	6239791.235
157	Narrow-leaved Apple	*Angophora bakeri*	7	1	120						307954.2396	6239791.027
158	Narrow-leaved Apple	*Angophora bakeri*	6	1	110	40					307955.7039	6239791.793
159	Brushbox	*Lophostemon confertus*	5	2	80	60					307955.4085	6239788.942
160	Parramatta Wattle	*Acacia parramattensis*	6	3	230	200					307900.4317	6239768.289
161	Parramatta Wattle	*Acacia parramattensis*	6	2	200						307901.0341	6239771.945
162	Forest Red Gum	*Eucalyptus tereticornis*	20	8	600	500					308222.7129	6241782.79

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163	Forest Red Gum	*Eucalyptus tereticornis*	20	8	650	600					308235.8606	6241784.246
164	Forest Red Gum	*Eucalyptus tereticornis*	20	8	550	400					308236.0689	6241778.812