GEOSCAPES
LANDSCAPE ARCHITECTS

SSD 10459 - Central Sydney Industrial Estate

LOT 6 - DOWNER SUSTAINABLE ROAD RESOURCE CENTRE

LANDSCAPE MANAGEMENT PLAN

Report Ref: **190130_CC_RPT_LMP01**

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1.0 INTRODUCTION

1.1 Project Background

This Landscape Management Plan (LMP) has been prepared to fulfill DA condition B51 and B52 of the approved Stage 1 - Lot 6 Downer Rosehill development located at Lot 6 - 9 Devon Street, Rosehill. Condition B51 and B52 state:

B51. Prior to the commencement of construction, the Applicant must prepare a Landscape Management Plan (LMP) to manage the revegetation and landscaping works on-site, to the satisfaction of the Planning Secretary. The LMP must form part of an OEMP in accordance with condition C5. The LMP must:

(a) detail the species to be planted on-site, using only locally native species;
(b) describe the monitoring and maintenance measures to manage revegetation and landscaping works; and
(c) be consistent with the Applicant's Management and Mitigation Measures at Appendix 2.

B52. The Applicant must:

(a) not commence operation until the LMP is approved by the Planning Secretary;
(b) implement the most recent version of the LMP approved by the Planning Secretary; and
(c) maintain the landscaping and vegetation on the site in accordance with the approved LMP required by Condition B51 for the life of the development.

1.2 This Report and Author

Geoscapes Pty Ltd has been commissioned to produce a Landscape Management Plan (LMP) for the above mentioned development. This LMP has been written by Ben Gluszkowski, the director of Geoscapes and a AILA Registered Landscape Architect.

Geoscapes also prepared the approved SSD (10459) landscape design drawings and landscape design report. These documents detail landscape treatments to the site, and should be read in conjunction with this report.

1.3 The Role of this Landscape Management Plan

Lot 6 will contain the Downer Sustainable Road Resource Centre which is located within the southern part of the site. The front block will be used as a lay-down area during construction, with final use subject to a separate development application. The Stage 1 works include the asphalt plant, Reconomy facility, RAP processing facility, bitumen products plant, workshop, silos, main office, car parking, storage hardstand, road access and associated earthworks and landscaping.

New landscaping is proposed to be installed along the southern, eastern and western boundaries. The southern boundary proposes a riparian corridor in the form of a 40m offset from Duck River using an averaging method. Existing riparian vegetation will be retained and supplemented by new planting to create the riparian zone within Lot 6. This will also extend further across southern lots (as part of separate subdivision works).

Due to the site being located adjacent to the Duck River corridor, revegetation and visual screening with the use of landscape planting is an important part of the development. The visual appearance and scale of the built form can be reduced with the maintenance of existing vegetation and introduction of new native tree and shrub species. The ongoing management of landscape buffer zones and the riparian corridor is therefore, fundamental in maintaining visual mitigation of the development and flora and fanua habitats now and into the future. A Vegetation Management Plan or VMP has been prepared by AECOM and was submitted with the development application. This should be referenced where required. Planting numbers and locations have been detailed in the landscape plans following species listed in the VMP.

1.4 Areas to which this Plan Applies

This plan will apply to the following areas within the site boundary, these are:

- 5m swale to eastern boundary
- 5m landscape buffer to western boundary
- The riparian corridor to southern boundary

1.5 Landscape Maintenance Responsibility

The Landscape Contractor awarded the contract, will hold the first level of responsibility for the implementation of the Landscape Management Plan. The on-going, day-to-day implementation, monitoring and reviewing of the LMP will be undertaken by Downer.

1.6 Landscape Management Principles

The following landscape management principles have been identified as being consistent with the approved SSD Landscape Documentation:

- Minimise environmental impacts that may result from landscape management activities and utilise environmentally sustainable practices. Disturb only the minimum area necessary.
- Control dust with best management principles.
- Mark clearance boundaries prior to commencement of construction to ensure that there is no removal of native vegetation.
- Strengthen, enhance and promote local character with the use of native and endemic planting in all landscape areas and for any replacement plantings.
- Construct, manage and maintain a fully structured riparian corridor.
- Adopt a low water use, low maintenance approach with the use of native species.
- Provide clear site lines for trucks and vehicular users.
- Provide a safe environment, minimising potential risks to people, buildings and property.
- Best practice landscape maintenance in landscaped areas.
- Target environmental weeds and feral animals through the use of integrated pest management approaches, as per section 5.2 of this LMP
- Undertake monitoring, auditing and maintenance activities to ensure an effective and a resilient landscaping outcome.
- Appropriately fund, plan and manage landscape maintenance to provide sufficient resource to achieve a long term quality landscape.

1.7 Report Structure

This report is to be read in conjunction with the following documents:

- Landscape Drawings for State Significant Development- SSD 10459 prepared by Geoscapes Landscape Architects, Dwg No's SSD-00 to

SSD-17.
• Landscape Design Report for State Significant Development - SSD 10459 prepared by Geoscapes Landscape Architects, Rpt No: LDR01
• Operational Environmental Management Plan (OEMP).
• Construction Environmental Management Plan (CEMP).
• SSD 10459 Development Consent Appendix 2 - Applicant's Management and Mitigation Measures.
• Vegetation Management Plan (VMP), prepared by AECOM 2020

Section 1.0 provides an introduction to the LMP
Section 2.0 describes the general site conditions
Section 3.0 describes the proposed planting species
Section 4.0 describes specific landscape types
Section 5.0 describes irrigation and disease control
Section 6.0 describes protective measures for trees, vegetation and erosion
Section 7.0 monitoring and reporting

The report describes maintenance categories as follows:

1. Specific Landscape types –

• Swamp Oak Floodplain Forest within the Riparian Zone - This re-vegetation area has a mix of trees, shrubs, native grasses and groundcovers planted in accordance with the Landscape Plans.
• Eastern Swale - This is planting capable of surviving in temporary inundation type conditions.
• Buffer Planting - This is a 5m setback containing native tree, shrub and groundcover planting to the western boundary.

2. All areas of the site – Those maintenance activities that apply to all areas of the site. These activities include but is not limited to:

a. Soil Management
b. Mulching
c. Pruning
d. Weeding
e. Disease and Insect Control
f. Irrigation

1.8 Intensity of Use

A key factor in the frequency and types of landscape maintenance activities required for particular areas is the intensity of their use.

All planting areas

Planting occurs close to the site boundary in areas to the south, east and western boundaries. These will generally be of low activity.

Areas of mass / riparian planting are not generally susceptible to compaction from pedestrian usage, therefore heavier textured soils can be used if required.

2.0 GENERAL SITE CONDITIONS

2.1 Soil

The site had previous industrial uses and has been remediated. It is recommended that all topsoil be imported for new planting works.

2.2 Existing Vegetation

Within the landscape plans and VMP, an area along the shoreline to Duck River has been identified for retention and protection. Sediment, protection fencing and management activities for this area are described within the VMP.

3.0 PROPOSED PLANTING SPECIES

3.1 Riparian Planting

The riparian area will be planted with trees, shrubs and groundcovers that form part of the Swamp Oak Floodplain Forest community. Across the entire corridor, approximately 500 canopy and sub canopy trees are proposed to be planted to fulfill re-vegetation outcomes within the VMP. A future 2.5m wide access track has been proposed for maintenance. All species are listed in the schedule within section 3.5 and the landscape documentation and should be read in conjunction with this LMP. The landscape plans document the placement and planting of species listed in the VMP. They are intended to create a fully structured 40m averaged riparian zone. The Downer site contains only part of the riparian corridor and access for maintenance of this area will be from the southern part of the Downer lot.

3.2 Swale Planting

The eastern swale is to be planted with a mix of native grasses capable of growing in conditions of temporary water inundation.

3.3 Western Buffer Planting

The western buffer is intended to be mass planted with layered native trees, shrubs and ground covers and will provide a 5m screening buffer from the adjoining lot.

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3.4 LOT 6 Plant Species

Stage 1 Lot 6 Downer Site Planting							
CODE	BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	MATURE WIDTH	POT SIZE	NATIVE	PLANTING DENSITY
Trees							
CAL SAL	*Callistemon salignus*	Sweet Willow Bottlebrush	8m	5m	100LT	✓	AS SHOWN
ELA RET	*Elaeocarpus reticulatus*	Blueberry Ash	9m	4m	75LT	✓	AS SHOWN
EUC TER	*Eucalyptus tereticornis*	Forest Red Gum	20-30m	5m	75LT	✓	AS SHOWN
GLO FER	*Glochidion ferdinandi*	Cheese Tree	15m	8m	100LT	✓	AS SHOWN
WAT FLO	*Waterhousea floribunda*	Weeping Lilly Pilly	8m	5m	75LT	✓	AS SHOWN
Shrubs & Hedge planting							
ACM smi	*Acmena smithii*	Lilly Pilly	3m**	1m	200mm	✓	750mm Ctrs
BUR spi	*Bursaria spinosa*	Sweet Bursaria	1.5-4m	1.5-3m	200mm	✓	AS SHOWN
COR alb	*Correa alba*	White Correa	1.5m	1.5m	200mm	✓	AS SHOWN
COR gla	*Correa glabra 'Ivory Lantern'*	Rock Correa	1.6m	0.6m	200mm	✓	AS SHOWN
COR ref	*Correa reflexa*	Native Fuchsia	0.5-1.2m	0.5m	200mm	✓	AS SHOWN
CAL rev	*Callistemon citrinus 'Reeve's Pink'*	Reeve's Pink Bottlebrush	3m	2m	200mm	✓	AS SHOWN
CAL whi	*Callistemon citrinus 'White Anzac'*	Bottlebrush	0.5-1.5m	2m	200mm	✓	AS SHOWN
CRI ped	*Crinum pedunculatum*	Swamp Lily	1.5-3m	1-3m	200mm	✓	AS SHOWN
DOR exc	*Doryanthes excelsa*	Gymea Lily	2-3m	2-3m	200mm	✓	AS SHOWN
Grasses and Groundcovers							
DIA bre	*Dianella caerulea 'Breeze'®*	Blue Flax Lily	0.8m	0.8m	Tubestock	✓	5/m2
DIA lil	*Dianella caerulea 'Little Jess'™*	Blue Flax Lily	0.4m	0.4m	Tubestock	✓	5/m2
LOM tan	*Lomandra longifolia 'Tanika'®*	Spiny-headed Mat-Rush	0.8m	0.6m	Tubestock	✓	5/m2
LOM kat	*Lomandra longifolia 'Katrinus Deluxe'*	Spiny-headed Mat-Rush	0.8m	0.8m	Tubestock	✓	5/m2
VIO ban	*Viola banksii*	Native Violet	0.4m	NIL	140mm	✓	3/m2
Swale planting							
BAU jun	*Baumea juncea*	Bare Twig Rush	1m	1m	Tubestock	✓	3/m2
CAR app	*Carex appressa*	Tall Sedge	1m	1m	Tubestock	✓	3/m2
DIA cae	*Dianella caerulea*	Blue Flax Lily	0.8m	1.5m	Tubestock	✓	3/m2
GAH cla	*Gahnia clarkei*	Saw Sedge	1.5m	1.5m	Tubestock	✓	3/m2
IMP inu	*Imperata cylindrica var. major*	Blady Grass	1.2m	0.3m	Tubestock	✓	3/m2
ISO inu	*Isolepis inundata*	Swamp Club-sedge	0.5m	0.5m	Tubestock	✓	3/m2
JUN usi	*Juncus usitatus*	Common Rush	1.2m	0.5m	Tubestock	✓	3/m2
LOM lon	*Lomandra longifolia*	Spiny-headed Mat-Rush	0.8m	0.8m	Tubestock	✓	3/m2

*Final plant number to be calculated at CC stage

**To be trimmed to specified height

3.5 Riparian Corridor Plant Species

Riparian Corridor Planting - Swamp Oak Floodplain Forest							
CODE	BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	MATURE WIDTH	POT SIZE	NATIVE	PLANTING DENSITY
Trees Canopy Species 1 per 300m2							
ALP EXC	*Alphitonia excelsa*	Red Ash	20m	15m	Forestry Tube	✓	AS SHOWN
CAS GLA	*Casuarina glauca*	Swamp Oak	20m	15m	Forestry Tube	✓	AS SHOWN
GLO FER	*Glochidion ferdinandi*	Cheese Tree	15m	8m	Forestry Tube	✓	AS SHOWN
MEL STY	*Melaleuca styphelioides*	Prickly-leaved Paperbark	10m	8m	Forestry Tube	✓	AS SHOWN
MEL QUI	*Melaleuca quinquenervia*	Broad-leaved Paperbark	20m	6m	Forestry Tube	✓	AS SHOWN
Small Trees / Shrubs 1 per 50m2							
ACM smi	*Acmena smithii*	Lilly Pilly	3-5m	2m	Tube	✓	AS SHOWN
CUP ANA	*Cupaniopsis anacardioides*	Tuckeroo	6m	3m	Tube	✓	AS SHOWN
CAL SAL	*Callistemon salignus*	Sweet Willow Bottlebrush	8m	5m	Tube	✓	AS SHOWN
MEL alt	*Melaleuca alternifolia*	Narrow-leaved Paperbark	7m	3m	Tube	✓	AS SHOWN
MEL ERI	*Melaleuca ericifolia*	Swamp Paperbark	9-15m	3m	Tube	✓	AS SHOWN
MYO acu	*Myoporum acuminatum*	Waterbush	10m	3m	Tube	✓	AS SHOWN
Grasses and Groundcovers 1 per 2.5m² in fully structured vegetation only							
BLE ind	*Blechnum indicum*	Swamp Water-fern	1m	NIL	Forestry Tube	✓	AS SHOWN
CAR app	*Carex appressa*	Tall Sedge	1m	1m	Forestry Tube	✓	AS SHOWN
DIA cae	*Dianella caerulea*	Blue Flax Lily	0.8m	1.5m	Forestry Tube	✓	AS SHOWN
JUN usi	*Juncus usitatus*	Common Rush	1.2m	0.5m	Forestry Tube	✓	AS SHOWN
ISO inu	*Isolepis inundata*	Swamp Club-sedge	0.5m	0.5m	Forestry Tube	✓	AS SHOWN
LOM lon	*Lomandra longifolia*	Spiny-headed Mat-Rush	0.8m	0.8m	Forestry Tube	✓	AS SHOWN
VIO ban	*Viola banksii*	A Violet	0.40m	NIL	Forestry Tube	✓	AS SHOWN
Vines 1 per 25m² in fully structured vegetation only							
PAR str	*Parsonsia straminea*	Common Silkpod	0.1m	NIL	Tube	✓	AS SPECIFIED
STE dis	*Stephania japonica var. discolor*	Snake Vine	na	NIL	Tube	✓	AS SPECIFIED
FLA ind	*Flagellaria indica*	Whip Vine	15m	NIL	Tube	✓	AS SPECIFIED
Bioretention Basin planting							
BAU jun	*Baumea juncea*	Bare Twig Rush	1m	1m	Tubestock	✓	5/m2
CAR app	*Carex appressa*	Tall Sedge	1m	1m	Tubestock	✓	5/m2
DIA cae	*Dianella caerulea*	Blue Flax Lily	0.8m	1.5m	Tubestock	✓	5/m2
GAH cla	*Gahnia clarkei*	Saw Sedge	1.5m	1.5m	Tubestock	✓	5/m2
IMP inu	*Imperata cylindrica var. major*	Blady Grass	1.2m	0.3m	Tubestock	✓	5/m2
ISO inu	*Isolepis inundata*	Swamp Club-sedge	0.5m	0.5m	Tubestock	✓	5/m2
JUN usi	*Juncus usitatus*	Common Rush	1.2m	0.5m	Tubestock	✓	5/m2
LOM lon	*Lomandra longifolia*	Spiny-headed Mat-Rush	0.8m	0.8m	Tubestock	✓	5/m2

4.0 LANDSCAPE MANAGEMENT ACTIVITIES

4.1 General

All plant species are native or endemic and have been selected from the VMP (for riparian corridor planting) or council planting lists, the landscape plans follow these selections and set out planting with specified densities and spacings. Areas shall be weed free and mulched annually to suppress weed growth and retain moisture content within the soil.

The key differences in the management of native plants are their requirement for low-phosphorous fertilisers and a lower fertiliser rate than exotic species generally. Plants of the Pea group (including Acacias, Daviesia and Pultenaeas) and Casuarinas are also able to fix their own Nitrogen. Natives also have lower water requirements in comparison to exotics and are adapted to the harsher Australian conditions.

For the above reasons native plantings make a more sustainable option in respect of the long term landscape management and should there be failures the original species specified on the landscape plans should always be reused.

4.2 Swamp Oak Floodplain Forest (SWOF) within Riparian Corridor

To protect waterways, loose mulch should not be placed within 10m of the top of bank. Mulch under a covering of biodegradable erosion protection, such as pegged and overlapped open-weave jute mesh, should be used for revegetation areas within 10m of the top of bank.

Tubestock is used throughout the riparian corridor, therefore a 10-15% failure rate is to be expected through the establishment stage. The contractor is to monitor and replace failed tubestock immediately.

4.3 Swale Planting

Tubestock sedges and rushes are to be planted within the swale at a rate of 3 per m2 as to not adversely affect flows. A minimum of eight (8) species are to be utilised in these areas.

4.4 Soil Management

As a general rule riparian or areas of native mass planting require a sandy loam to clay loam topsoil mix which is suitable for the planting of grasses, woody and herbaceous perennials and trees. The following mix is suitable for plants that do not have high nutrient requirements and are not susceptible to compaction. Note that if phosphorous sensitive natives are used, the phosphorous levels of all components must be checked for suitability. Additional drainage may be required depending on the situation.

The following table outlines suggested components, that may likely meet the physical requirements of the soil for all landscape areas:

Sandy loam soil or site won topsoil Composted soil conditioner conforming with AS 4454	70-100% by volume 0-30% by volume	e.g. 8 parts washed sand/2 parts sandy loam/1 part AS 4454 compost

(Leake and Haege 2014, p.87)

4.5 Fertilising, Composting and Mulching

To ensure the health and vigor of the riparian and street trees are maintained. Mass planted areas will perform better when the soil conditions

are healthy. Building healthy soils is the key to achieving the long term maintenance goals of mass planted landscape areas. Soil health is primarily achieved with regular applications of organic soil conditioners such as animal manures, decomposed green waste or proprietary blends of compost.

Fertilising and composting are not critical maintenance activities except where there are obvious deficiencies, but should be assessed on an annual basis by observation and leaf analysis.

Maintain an adequate level of mulch to all planting and new riparian areas in order to maximise water conservations and to suppress weeds. Do not use organic mulches in the swale. Instead a rock mulch should be used that will not be disturbed by water flows.

4.6 Pruning

Remove dead or dying plant material from mass planted areas on the site as required. This may become necessary as plantings mature, after damage or adverse environmental conditions. Pruning will be carried out on trees and shrubs that require it to remove the dead and damaged branches and to retain natural shape and to improve health and vigour. Where die-back of plant material has been identified new plants will be planted as soon as possible, using species originally specified.

4.7 Weeding

For the riparian corridor, a detailed Weed Management Plan is also described within the VMP .

Weeding is often a concern in new areas of revegetation type landscaping. As of 1 July 2017 the NSW Noxious Weeds Act 1994 was repealed and replaced with the NSW Biosecurity Act 2015 and its accompanying Biosecurity Regulations. Under the act, plants are no longer termed "noxious weeds" nor do they have "classes" of weeds. The new legislation provides greater flexibility to respond to, manage and control all weed species. All plants are assessed for their biosecurity risk. This is the risk that the introduction, presence, spread or increase of a plant will have, or may potentially have, an adverse effect on the economy, the environment or the community.

Environmental weeds are non-local plants that can invade and change natural areas and threaten the survival of native plants and animals. After land clearing, environmental weeds are considered to be the next greatest threat to our indigenous biological diversity. Environmental weeds have the potential to readily invade planting bed areas and potentially impact on the adjacent lands.

In addition to the environmental hazard posed by weeds, weeds occurring in mass planted beds, growing from the base of trees and from pavement can be unsightly and presents an untidy appearance.

Appendix 1 of the Greater Sydney Regional Strategic Weed Management Plan 2017-2022 lists all priority weeds for the Greater Sydney region that have prescribed requirements under the NSW Biosecurity Act 2015. It also lists other regional priority weeds and the minimum outcomes that demonstrate compliance with the general biosecurity duty.

NSW WeedWise is a NSW Department of Primary Industry website which profiles over 300 high priority weeds across the State and Greater Sydney Region. It describes the Biosecurity duty required under the Biosecurity Act 2015 for each plant and outlines their methods of control (including registered herbicide options).

Another guide for the control of weeds on the site is the New South Wales Weed Control Handbook a guide to weed control in non-crop, aquatic and bushland situations NSW DPI management guide, seventh edition.

A copy of the handbook can be downloaded at the link:

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0017/123317/weed-control-handbook.pdf

To ensure that environmental weeds do not reproduce within or spread into mass planted areas and compete with plantings and spread to other areas such as Duck River, weeding and weed control is considered to be a critical maintenance action.

Maintenance Action Required	Frequency
Prevent reproduction of weeds by destroying seedlings and established weeds before seed set or other propagules form. Remove by hand in the first instance (where infestations are low). Ensure that the entire weed including all roots is removed. Dispose of the weeds off site.	Monthly or as defined by the VMP
Remove by Herbicide application any weeds which cannot be controlled by hand removal. Herbicide application must occur before weed seed set. Non-target species and areas must be reinstated if damaged by herbicide application.	
Herbicide use to be in accordance with regulation rates and manufacturers recommendations. Herbicide use must comply with the requirements of the Noxious and environmental weed control handbook. A guide to weed control in non-crop, aquatic and bushland situations. NSW Department of Primary Industry Management Guide, Seventh Edition.	
After spraying, lop any dead weeds flush with the ground surface and dispose of the cuttings.	Monthly or as defined by the VMP
Use of bio-degradable herbicide is mandatory	

5.0 IRRIGATION, DISEASE AND INSECT CONTROL

5.1 Temporary Irrigation

It is recommended that the riparian corridor has a temporary irrigation system installed to help establish revegetation works within the first 6 months after planting. The irrigation system is to be designed, supplied and installed by an experienced specialist irrigation contractor, nominated by the Landscape Contractor and approved by the Head Contractor or their landscape consultant. After selection they will be required to prepare detailed irrigation plans and specifications for approval prior to commencing work. The Landscape Contractor will co-ordinate the irrigation installation to the client / landscape architects approval. Ensure completion of the irrigation system before the commencement of any other landscape works, so as to provide a readily available supply of water to planting areas.

Upon completion of the installation of irrigation works, the Landscape Contractor is to run through the system to ensure that it is operating correctly and instruct the client's representative in the correct operation and maintenance of the system.

The following principles are to apply:

Maintain adequate soil moisture – match supplemental irrigation water needs to climate conditions and available soil water
Water effectively – apply water so that it reaches the root systems with minimal losses
Encourage extension of the root system – apply water to extremity of root system and beyond
Remove competition for water – maintain mulch around the plants

5.2 Disease, Insect and Feral Animal Control

Always consider biological and non-chemical controls in favour of chemical controls in the first instance because the margin for error is far smaller with chemicals. For example most insecticide will also harm beneficial insects as well as the target species. For a comprehensive reference to the identification, diagnosis and control of pests and diseases refer to "What Garden Pest or Disease Is That? Organic and Chemical Solutions for Every Garden Problem" by Judy McMaugh 2000 New Holland.

If feral animals become a problem refer to Greater Sydney Regional Strategic Pest Animal Plan 2018 - 2023.

The plan can be found at the following location:

https://www.lls.nsw.gov.au/__data/assets/pdf_file/0003/820794/greater-sydney-strategic-pest-plan-web.pdf

6.0 PROTECTIVE MEASURES

6.1 Protection of Existing Vegetation

Existing vegetation to the Duck River shoreline is nominated within the VMP and landscape documentation to be protected and retained.

Existing vegetation needs protection during construction and establishment. An existing fence is present along the edge of the existing Duck River riparian vegetation and is likely to remain in place during construction.

As per commitments of the EIS, the existing native vegetation along Duck River is to be demarcated as a no-go zone and is to include appropriate signage. Access to the riparian corridor (outside the existing native vegetation) during construction is to be limited to personnel and equipment required to install the stormwater outfalls and for revegetation works. After the stormwater outfalls and revegetation works are complete, the riparian corridor will be permanently fenced.

6.2 Tree Protection

Tree protection must comply with the Australian Standard 4970 – 2009 Protection of trees on development sites.

The relevant Australian Standards are:
- AS 4970 Protection of trees on development sites.
- AS 4687 Temporary fencing and hoardings

6.3 Erosion, Contamination and Sedimentation Control

During construction, all precautions necessary should be undertaken to prevent erosion, contamination, and sedimentation of the site, surrounding areas and drainage systems, including but not limited to the following:

- Construction of temporary drains and catch drains

- Diversion and dispersal of concentrated flows to points where the water can pass through the site without detrimental impacts

- Construction and maintenance of silt traps to prevent discharge of scoured material to downstream areas

- Stabilisation of exposed soil surfaces

• Use of erosion and sediment control measures to collect sediment and to reduce flow velocities

• Construction of sediment fencing and erosion controls as per Landcom's Managaing Urban Stormwater: Soils and Construction 2004.

• Regular monitoring and maintenance of all erosion and sediment control structures throughout the construction and operational phases of the development to ensure their effective function.

7.0 MONITORING AND REPORTING

General maintenance tasks are described in SSD landscape drawing Specifications & Typical details SSD-16. A Maintenance Schedule is also included in Appendix B of this report. A log book should be used to record daily/weekly/monthly visits. All maintenance actions should be recorded in the log book.

Regular inspections of all landscape areas should be undertaken initially by the appointed contractor and then by lot owners following handover. This is to ensure that maintenance is carried out according to the plan. Inspections should include the ongoing protection of revegetation works during its establishment period.

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8.0 APPENDICES

8.1 Appendix A - Approved Central Sydney Industrial Estate Landscape Masterplan

8.2 Appendix B - Maintenance Schedule

CATEGORY		TIMEFRAMES / FREQUENCY			
	Daily/Weekly	2 Weekly/Monthly	3 to 6 Months	As Required	Tasks and Specification
1. Weeding and Rubbish Removal		✓			Remove by Herbicide application any weeds which cannot be controlled by hand removal. Herbicide application must occur before weed seed set. Protect plants from overspray and avoid if rain is likely within 12 hour period. Non-target species and areas must be reinstated if damaged by herbicide application. Dispose of any waste material using appropriate methods and at designated disposal sites. Maintain weeds for a period of 12 months, with more frequent weeding in the summer months. Use of bio-degradable herbicide is mandatory
2. Leaf Litter Removal		✓	✓		Remove leaf litter from pathways
3. Mulching		✓	✓		Reapply mulch to maintain to a depth of 75mm in areas that are deficient. Soil should be aerated before placing mulch. After 12 months, mulching will have broken down and should be topped up to ensure a depth of 75mm. A slow release, low phosphorous fertiliser should also be applied.
4. Plant Fertiliser			✓		Only to be applied if plants are noticeably under stress and the plant will benefit from the application of the fertiliser. Apply slow release fertiliser N:P:K ratio– 18:3:10 at manufacturer's recommended rate per plant.
5. Pest & Disease Control		✓		✓	Check for incidence of fungal and insect attack. Avoid use of chemical sprays. Apply appropriate treatment for fungal and insect attack if necessary. Check for damage by animals, seek specialist advice if persistent damage is observed.
6. Pruning, Trimming, Stakes and Ties		✓			Remove deadwood, remove suckering roots from rootball, check ties. Improve plant shape and promote new growth .Adjust ties and stakes as necessary. Stakes can be removed once plants are self-supporting. Identify need for tree structural work and appoint contractor to perform work.
7. Plant Removal & Replacements		✓			Inspect for failed or dying plants requiring replacement and record probable cause. Replant after dead or failed plant removal. Densities, sizes and species to be in accordance with Landscape DWG SSD-17 and relevant drawing sheet no. Water replacement plantings for a minimum of 12 weeks after planting.
8. Urgent Works	✓				To be actioned within 7 days.
9. Watering	✓	✓			Water as necessary every day especially during periods of hot weather. 2 week interval watering should be maintained until planting is fully established. Best practice watering is early morning or late afternoon to reduce evaporation.

CATEGORY		TIMEFRAMES / FREQUENCY				
	Daily/Weekly	2 Weekly/Monthly	3 to 6 Months	Annually	As Required	Tasks and Specification
SWALE						
1. Outlet			✓		✓	Check for no evidence of erosion, blockage, damage or standing water. Outlet freely draining. No excessive sediment build-up (i.e. more than 20% of pipe opening blocked with sediment). Refer to Water by Design (2012) Rectifying Vegetated Stormwater Treatment Assets, if the erosion is either recurring or severe.
2. Erosion and Scour			✓			Check for no evidence of erosion. Eroded areas should be locally re-profiled or reinforced and re-planted if necessary. Refer to Water by Design (2012) Rectifying Vegetated Stormwater Treatment Assets, if the erosion is either recurring or severe.
3. Sediment accumulation			✓			Check for no sediment accumulation in the base of the swale. Sediment should be removed from the base if it is impeding the free drainage of stormwater. The removal of accumulated sediment may involve removal and re-establishment of vegetation. Refer to Water by Design (2012) Rectifying Vegetated Stormwater Treatment Assets, if excessive sediment deposition is a recurring issue. Note: the disposal of sediment material must comply with EPA NSW guidelines for the disposal of contaminated soil .
4. Surface ponding and boggy conditions				✓		Check for no surface ponding or permanently saturated soils in the base of the swale 24 hours after rainfall. Note: the presence of mosquito larvae in isolated pools of water may indicate ponding problems. Sediment should be removed from the base of the swale if it is impeding the free drainage of stormwater. The removal of accumulated sediment may involve removal and re-establishment of vegetation. Refer to Water by Design (2012) Rectifying Vegetated Stormwater Treatment Assets if excessive sediment deposition is a recurring issue. Note: the disposal of sediment material from a swale must comply with EPA NSW guidelines for the disposal of contaminated soil.

8.3 Appendix C - Reference Documents

The following Australian Standards are referred to in this management plan:

- AS 1319 Safety signs for the occupational environment
- AS 4373 Pruning of amenity trees
- AS 4454 Composts, soil conditioners and mulches
- AS 4687 Temporary fencing and hoardings
- AS 4970 Protection of trees on development sites

The following documents are referred to in this report:

- Landscape Drawings for State Significant Development- SSD 10459 prepared by Geoscapes Landscape Architects, Dwg No's SSD-00 to SSD-17.
- Landscape Design Report for State Significant Development - SSD 10459 prepared by Geoscapes Landscape Architects, Rpt no: LDR01
- Operational Environmental Management Plan (OEMP).
- Construction Environmental Management Plan (CEMP).
- SSD 10459 Appendix 2 - Applicant's Management and Mitigation Measures.
- Vegetation Management Plan (VMP), prepared by AECOM 2020
- Noxious and environmental weed control handbook. a guide to weed control in non-crop, aquatic and bushland situations. NSW Department of Primary Industry Management Guide, Seventh Edition.
- Soils for Landscape Development. Selection, Specification and Validation. Simon Leake and Elke Haege. CSIRO Publishing 2014.
- What Garden Pest or Disease Is That? Organic and Chemical Solutions for Every Garden Problem. Judy McMaugh 2000 New Holland.

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