TripleTwoNine
13 Endeavour Road Caringbah

Vegetation Management Plan

prepared for

Aliro Trusco 1 Pty Ltd atf Endeavour Shores Trust

TripleTwoNine, 13 Endeavour Road Caringbah – Vegetation Management Plan

prepared for

Aliro Trusco 1 Pty Ltd atf Endeavour Shores Trust (Aliro)

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Statement of Authorship

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Revision Schedule

Rev No	Date	Description	Issued to
1	04/10/2023	Vegetation Management Plan_Draft	Aliro
2	09/10/2023	Vegetation Management Plan_submitted	Aliro
3	30/08/2024	Vegetation Management Plan_amended for review	Aliro
4	01/11/2024	Vegetation Management Plan_amended	Aliro

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1. Introduction

1.1 Background

This Vegetation Management Plan (VMP) has been prepared by écologique on behalf of Aliro, to support a Development Application (DA) for a mixed-use warehouse and distribution, light industrial, commercial, childcare and café development known as TripleTwoNine, 13 Endeavour Road, Caringbah.

The Site is located adjacent to Woolooware Bay to the northeast, which comprises several environmentally sensitive aspects, which include:

+ Towra Point Aquatic Reserve listed under the *Marine Parks Act 1997*
+ Taren Point Shorebird Reserve located approximately 1.2km to the north along the foreshore
+ 'Coastal Wetlands' under the State Environmental Planning Policy (Resilience and Hazards) 2021
+ Key Fish Habitat mapped by DPI Fisheries – Woolooware Bay to the highest astronomical tides (HAT)
+ Land mapped as Biodiversity Values under the BC Reg. to the northeast of the Site, associated with the mangrove community immediately adjacent to the Site
+ The Ramsar listed Towra Point Nature Reserve approximately 1.1km to the east along the foreshore and approximately 2km to the north on the opposite foreshore of the bay

Within the Site itself, the following mapped environmental layers occur:

+ 'Proximity Area for 'Coastal Wetlands' under State Environmental Planning Policy (Resilience and Hazards) 2021
+ 'Environmentally Sensitive Land – terrestrial biodiversity under the Sutherland Shire LEP.
+ 'Restoration' under Sutherland Shire Council's Greenweb Strategy
+ 'Threatened species buffer' under the Sutherland Shire DCP

The VMP applies to the revegetation of a foreshore buffer zone, which is located in the northeast of the Site. While physically separated from Woolooware Bay by security fencing and a shared public pathway, the proposed foreshore buffer zone is less than 10 m from and will provide an ecological extension of the bay into the terrestrial environment.

The revegetation of the foreshore buffer zone has been identified as an important development outcome by both Sutherland Shire Council (Council) and the Department of Primary Industries (DPI) Fisheries.

The VMP responds to Council's and DPI Fisheries requirements, which include:

+ Council's requirement for the preparation of a landscape management plan (LMP) that details the creation of the vegetation buffer. The LMP must be prepared by a suitably qualified, experienced and accredited ecologist to ensure an appropriate buffer is implemented and important vegetation is retained and protected.
+ DPI Fisheries' requirement to use local native riparian vegetation species across the buffer zone to improve riparian habitat values.

The VMP has been prepared in tandem with the Landscape masterplan (Habit8, 2023), which has addressed social, cultural, recreational, and educational opportunities within natural landscapes.

Additional feedback was provided by Council on 3 May 2024 (reference DA23/0721 PAN-379298), which is outlined in the following summary table.

Table 1 1. Existing VMP areas

DA23/0721 PAN-379298 – 3 May 2024	How and where addressed
The Vegetation Management Plan (VMP) is to be updated as follows:	
+ To meet the requirements of NSW DPI Fisheries as well as Councils Greenweb – the VMP must be modified to specify that only locally indigenous species are planted within the foreshore buffer zone	The following amendments to the VMP were made to address the concerns raised: + *Cakile maritima, Sesuvium portulacastrum* removed from list + *Alectryon coriaceus* changed to *Alectryon subcinereus* + *Myoporum boobialla* changed to *Myoporum acuminatum* + *Oplismenus imbecillis* changed to *Oplismenus aemulus* + *Poa poiformis* changed to *Poa labillardierei*
+ Planting species for Bioretention swales must be included	Bioretention plant species selection has been included in Table 3-2.
+ Detail of proposed paths, seating areas and any other infrastructure proposed in the restoration foreshore area.	Details of the proposed foreshore treatments are discussed in Section 2 and shown in VMP Figure 2-1.
+ Table 3-3 Indicative planting densities and quantities, the subtotals column includes the area size in its calculations – please rectify.	Planting densities have been amended as requested and all areas / quantities and calculations have been checked and validated.
+ Amend tree and shrub planting rates change to; Trees - 1/7m² (from 1/5m²) and Shrubs - 1/2m² (from 1/3m²) to closer mimic Council's Greenweb Specification planting rates and reduce tree canopy cover allowing more light penetration to the lower canopy species.	
+ Table 3-2. Pre-planting indicates that mulching (as well as jute matting) will only cover 80% of the planting area. Clarification is to be provided as to why this has not been proposed for 100% of the planting area.	Mulching / jute matting in VMP zones 2 & 4 is a conservative estimate as retained plantings will collectively occupy greater than 20% of VMP zones 2 & 4 and mulching / jute matting of retained areas is unlikely to be feasible).
+ The plan is to include a requirement that reports regarding progress and maintenance works are provided to Council.	Reporting requirements are included in Section 3.5.
+ The plant species *Alectryon coriaceus* is not native to the Sutherland Shire and may become invasive. This could be substituted with *Alectryon subcinereus* (Native Quince) which can be found in the Sutherland Shire and is also a shrub to small tree size.	*Alectryon coriaceus* has been replaced with *Alectryon subcinereus.*

1.2 Site details

The Site is shown in Figure 1-2 and relevant site details are summarised herein.

Street address	13 Endeavour Road, Caringbah
Legal identification	Lot 2 in Deposited Plan 714965
Local Government Area (LGA)	Sutherland Shire Council
Local Environmental Plan (LEP)	Sutherland Shire LEP 2015
Zoning	B7 Business Park
Site area	12.39 hectares

The Site is irregular in shape and features a frontage to Captain Cook Drive to the southwest, Endeavour Road and more broadly the Taren Point/ Caringbah industrial precinct to the northwest, Solander Playing Fields to the southeast and Woolooware Bay to the northeast. A shared public pathway exists between the site and Woolooware Bay.

Figure 1-1 illustrates the Site's location in the context of Towra Point Aquatic Reserve, Taren Point, Towra Point Nature Reserve and Biodiversity Value Mapping.

The VMP applies to an area of 6,588 m^2 (0.66 ha), which is shown in Figure 1-2 and Table 1-1 summarises the existing landscape within the VMP.

Table 1-1. Existing VMP areas

Component	Area (m^2)	Area (ha)
Vegetation retained		
Established planted local native vegetation	397	
Established planted non-local native vegetation	296	
Established planted local/non-local native vegetation mix	440	
Subtotal	**1,133**	**0.11**
Exotic vegetation being cleared	**2,366**	**0.24**
Planted seedlings (existing VMP extent)	2,455	**0.25**
Hardstand/other	634	**0.06**
Total all areas	6,588	**0.66**

0 280 560 1,120

m

Legend

- Site boundary
- Ramsar Wetland (Towra Point NR)
- Estuarine Saltmarsh
- High Biodiversity Value mapping
- Towra Point Aquatic Reserve

Coordinate system: MGA Zone 56 (GDA 2020)
Image source: Nearmap 31 May 2023

TripleTwoNine, Caringbah

Figure 1-1 Site context

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Figure 1-2. VMP extent

Legend

- Site boundary
- VMP_extent
- Local native
- Local/non-local native mix
- Non-local native
- Native/exotic mix
- Existing VMP planting
- Exotic
- Turf
- Development footprint

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Coordinate system: MGA Zone 56 (GDA 2020)

Image source: Nearmap 31 May 2023

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1.2.1 Existing VMP extent

The existing VMP extent was established as part of the Development Application (DA21/0777) for the partial re-development of the Site.

The associated VMP was prepared by ELA and finalised in 2022 (herein referred to as the ELA-VMP to avoid confusion with this VMP).

Council has an 8:1 tree replacement policy, which in existing commercial and industrial developments is extremely difficult to achieve. The DA21/0777 required the removal of 75 trees and therefore required 600 replacement trees (in line with Council's policy).

The ELA-VMP was designed to ameliorate the impacts of DA21/0777's tree removal, which was endorsed by Council in lieu of the required 600 trees.

The existing VMP extent is 0.25 ha and its implementation was commenced in early 2023 as shown in photo plates 1 to 6, the plantings are still in the establishment phase.

Photo plate 1. Pre-ELA-VMP implementation (20/11/2022)

Photo plate 2. ELA-VMP vegetation clearing evident (16.02.2023)

Photo plate 3. ELA-VMP soil preparation evident (30.03.2023)

Photo plate 4. ELA-VMP planting & irrigation evident (01.05.2023)


Photo plate 5 (left) and **Photo plate 6** (right): ELA-VMP area viewed from northeast, shared pathway and mangroves in background, electricity easement overhead (17.07.2023)

1.2.2 Current proposal

The current proposal involves the redevelopment of the remaining areas of the Site and will require the removal of 459 trees. The trees proposed to be cleared are predominantly located in garden beds surrounded by hardstand.

115 trees are palm species that are susceptible to fusarium wilt (i.e., Canary Island date palm, Washington palm and cocos palm), with numerous Canary Island date and Washington palms already exhibiting death and dieback suspected of this pathogen already.

Fusarium wilt is a serious fungal disease that affects a range of palm species across the world including Australia. There is no effective treatment for this disease, and infection will eventually kill the tree. Fungal spores lay dormant in the soil until they detect a host. Dormant spores may move through the soil profile with groundwater or through foot traffic or vehicle traffic, on tools and equipment and by birds and possums. Figure 1-3 shows the location of trees suspected of being infected with Fusarium wilt, which suggests that the fungus is already widespread at the Site.

A reasonable estimate of tree clearing directly impacted by the proposal would be 344 (excluding palms). This would correspond to 2,752 replacement trees required in line with Council policy. However, to achieve this quantity of tree plantings within the Site would not be feasible under the existing development footprint and is counterintuitive to the Site's zoning as B7 Business Park (i.e., intended to optimise the future employment-generating potential of underutilised industrial areas).

The landscape masterplan (Habit8, 2024) and amended VMP provide high quality landscaping and revegetation of the foreshore, which is anticipated to overcome these constraints and exceeds Council's offsite tree replacement value[1].

[1] At the time of initial submission: replacement cost of 2,752 trees (excl. replacement of palms) = **$312,737.28** – based on **$113.64**/tree (excl. GST).

The current amended submission: replacement cost of 2,752 trees (excl. replacement of palms) = **$1,000,709.76** – based on Council's increased rate of **$363.63**/tree (excl. GST) and an Opinion of Probable Cost (Habit8,October 2024) of **$1,170,330.14** (softscape, irrigation and maintenance over 2yrs only, does not include hardscape or other landscape features).

Figure 1-3. Location of disease infected trees

2. VMP approach

2.1 Site constraints

The main constraint to the establishment of a fully structured foreshore buffer zone is:

+ The transmission easement that traverses the northern portion of the Site, which limits the type and height of vegetation that can be established; and
+ The support structure (stanchion) located along the Site's north-northeastern boundary, which the development must enable access for inspections and maintenance.

The landscape masterplan (Habit 8, 2024) has considered these constraints through incorporating the following design features:

+ A decomposed granite pathway that will provide light vehicle access to the stanchion (in the northern most extent of the foreshore buffer zone);
+ A decomposed granite pathway for pedestrian connectivity to the adjacent playing fields and the foreshore shared pathway (in the eastern most extent of the foreshore buffer zone); and
+ Mass planting beds of lower growing shrubs and groundcovers within the easement and fully structured planting outside of the easement.

These features collectively provide for revegetation of the foreshore zone, passive recreational opportunities and accessibility to public areas for employees and visitors (see Figure 2-1).

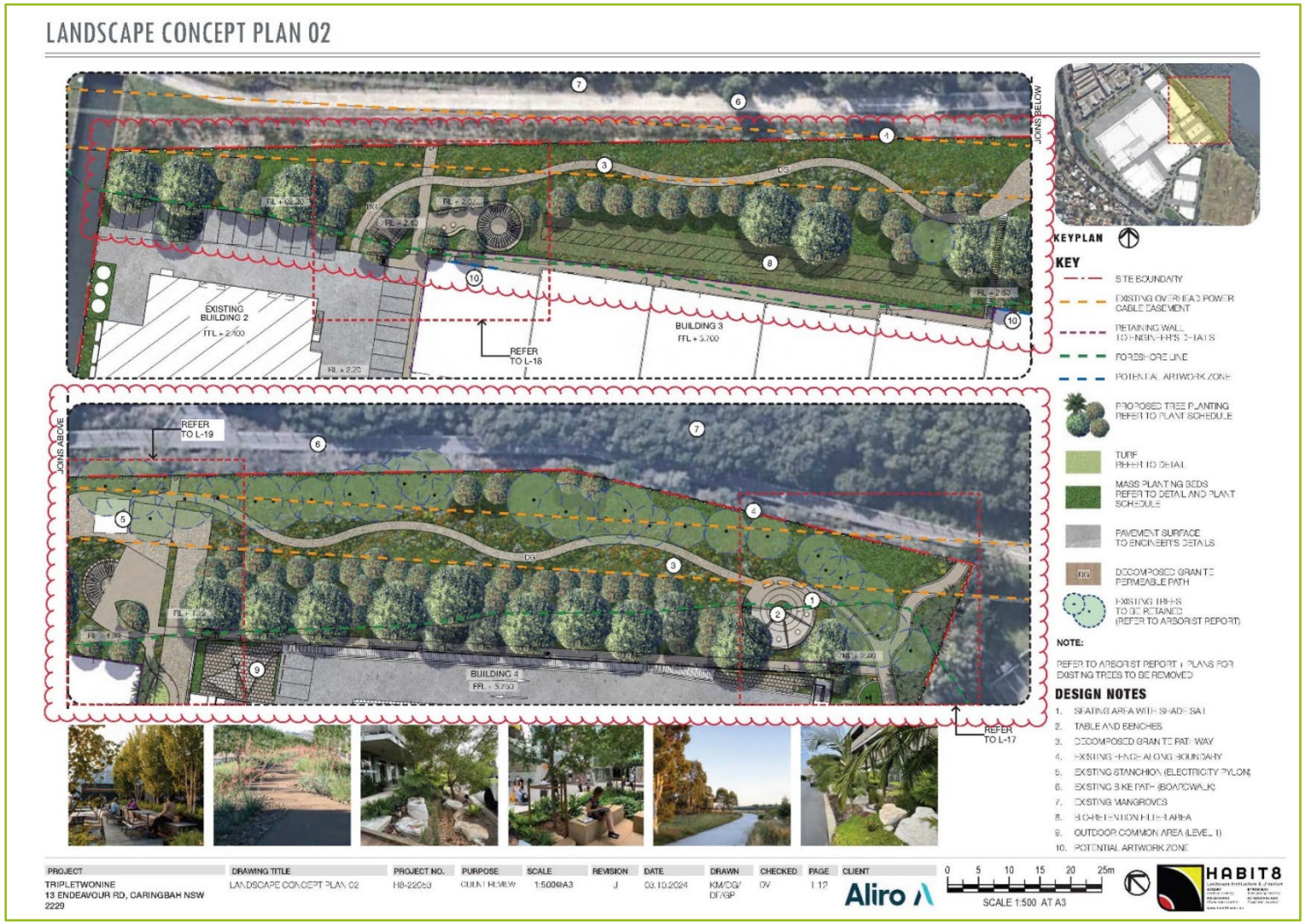

Figure 2-1. Landscape concept plan for foreshore buffer zone (Habit 8, 2024)

2.2 VMP management zones

VMP management zones collectively cover approximately 0.45 ha as described in Section 1.2 and Table 1-1.

The proposed management zones (as shown in Figure 2-2) have been determined through consideration of site constraints and include the following:

1) Existing trees / shrubs being retained (approximately 0.11 ha) – maintenance only required
2) Mass low growing plantings beneath the transmission line
3) Tree, shrub and groundlayer plantings
4) Bioretention plantings

2.1.1 Zone 1: Existing vegetation

Zone 1 (approximately 0.11 ha) contains a mixture of local and non-local planted native tree species, which are to be retained and include the following:

+ *Melaleuca quinquenervia* (broad-leaved paperbark)
+ *Acmena smithii* (lilly pilly)
+ *Cupaniopsis anarcoides* (tuckeroo)
+ *Ficus benjamina* (weeping fig)

This zone will require the installation of tree protection fencing around each tree's protection zone (TPZ) in accordance with the project arborists recommendations. It is assumed that this will be undertaken by the Civil Contractor as a part of the Site's clearing and earthworks activities.

2.1.2. Zone 2: Transmission easement planting

Zone 2 (approximately 0.16 ha) will be planted out with shrub and ground layer species specifically selected to remain at a compliant height beneath power lines and remain suitable for location adjacent access paths.

This zone comprises a portion of the ELA-VMP, which is being retained. An allowance has been made in this VMP for replacement planting and stabilisation should any direct or indirect impacts occur.

2.1.3. Zone 3: Fully structured planting

Zone 3 (approximately 0.36 ha) is the largest zone and will comprise plantings from all canopy, shrub and ground layers.

2.1.4. Zone 4: Bioretention basin

Zone 4 (approximately 0.05 ha) has been included in the VMP due its location within the foreshore buffer zone and the opportunity to incorporate naturally occurring grass, sedge and rush species into its establishment.

Due to its location in the foreshore buffer zone it is also logical that the establishment and initial maintenance of its plantings are included in the VMP. However, this will ultimately be determined by the Principal and Civil or other contractors as required.

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Figure 2-2. VMP management zones

Legend

- Subject_site
- Zone 1. Existing (retained) vegetation
- Zone 2. Mass planting
- Zone 3. All planting
- Zone 4. Basin (bioretention basin)

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Coordinate system: MGA Zone 56 (GDA 2020)
Image source: Nearmap 18 June 2024

3. VMP Implementation

3.1 Site Preparation

3.1.1 Civil works

Site preparation activities assume that the following components within the VMP extent will be undertaken by the Civil Contractor in accordance with the project's CEMP and relevant specialist sub-plans.

+ Protective fencing (ATF or similar) installation and signage denoting the VMP extent as a no-go and environmentally sensitive zone.

  This will need to be done in consultation with the Project Manager, Civil Contractor, VMP superintendent and the contractor engaged to implement the VMP, to ensure for the VMP work activities and to the electricity easement as may be required. Access will comprise unsealed tracks that will be excluded from the planting program.

+ Earthworks including removal of existing features, regrading works and clearing of vegetation.
+ Clearing of vegetation and earthworks in accordance with the project flora and fauna management plan (FFMP), which shall specify preclearance and clearance protocols, identification of habitat features and their reuse if appropriate, appropriate relocation sites for any displaced fauna.
+ Installation and ongoing maintenance of erosion and sediment controls in accordance with the and in the following locations at a minimum:
  - Generally, in accordance with the project's erosion and sediment control plan (ESCP), in particular that required surrounding the Site's boundary to the channel, adjacent bay and playing fields; and
  - At the base of protective fencing to protect the VMP zone.

NOTE: Where existing topsoil is not suitable for planting the civil contractor will need to introduce suitable topsoil at a depth to be determined by the VMP superintendent or Principal.

As the VMP extent has previously supported landscaping and turf, any requirement for topsoil introduction would be localised and minor in extent (e.g., areas where non-vegetated landscaped features are removed such as compacted gravel-base pathways, garden bed retaining walls or edging).

3.1.2 Photographic monitoring sites

Prior to the VMP's implementation suitable monitoring sites are to be established that are GPS measured and relocatable for ongoing photographic monitoring. Photographic monitoring shall be undertaken prior to the commencement of the following management activities:

+ Site preparation
+ Planting program
+ Practical completion of planting
+ Monthly over the duration of the establishment period
+ Thereafter three monthly over the duration of the maintenance period

3.1.3 Soil amelioration

With the exception of any areas that have been subject to compaction from construction activities, it is anticipated that existing soils will be suitable for revegetation without the need for amelioration (other than tilling/ripping of compacted soils).

It is anticipated that revegetation zones that are disturbed by construction activities will be made good by the Project's Civil Contractor.

3.1.2 Mulching

The higher elevated parts of VMP (zone 4) are to be mulched with a minimum 100mm layer of mulch to assist with weed suppression, improve soil water conservation and soil erosion control.

Mulch is to be placed to the required depth, clear of plant stems, and raked to an even surface flush with the surrounding finished levels. Mulch is to be spread so that after settling it is:

+ Smooth and evenly graded between design surface levels
+ Flush with adjacent finished levels
+ Of the required depths (100 mm depth)
+ Sloped towards the base of plant stems, but not in contact with the stem

Mulch may be used from chipped felled trees providing there is sufficient to stockpile mulch on the Site. Mulch brought into the Site shall only be accepted if appropriately certified.

Mulch shall not spread over planting areas without approval from the VMP superintendent or Principal (i.e., to validate soil preparation has been completed satisfactorily).

3.1.3 Jute matting

Jute matting shall be installed to the lower elevated part of VMP (Zone 2) to assist in weed suppression, and soil erosion control. Jute matting shall be 700gm pre-slitted jute matting.

3.2 Weed control

The extent of weed control will be dependent on both the extent and timing of construction and /or earthworks disturbance of the VMP extent.

The emergence of weeds will be at highest risk where soils are left exposed.

It is recommended that the Civil Contractor also be responsible for weed control during the period of time between completion of Civil works in the VMP zone and commencement of VMP's implementation.

3.3 Planting program

3.3.1 Plant procurement

Plant procurement involves the sourcing of plant species that are consistent with those provided in the Planting Schedule (provided in Appendix A) and sourced from the region.

Most commercial nurseries should be able to supply most species, however, at least four to six months advance notice will be required to ensure that the species listed the Planting Schedule (provided in Appendix A) are available for the intended commencement of planting.

Plant stock is to be inspected by the VMP superintendent (or otherwise appointed representative) at least one month prior to commencement of planting works and on delivery to the site.

Plants that are not: true to species; vigorous and healthy; with a well-developed root system; free from disease / pests; and are not without scars or dead wood; are to be rejected at delivery.

Planting shall be undertaken immediately after acceptance of plant delivery. If this is not possible: appropriate storage to keep the plants in good condition on the site, adequately protected from frost, wind, sun and vermin, and secured from vandals; shall be facilitated.

3.3.2 Planting procedure

Planting shall generally entail the following:

- Dig hole sufficient for root ball of plant. The removal from the container and the positioning of the plant is to be done with minimum disturbance to the roots.
- Slow-release native plant fertiliser (low phosphorous formulated native plant fertiliser tablet/granules) and water saving crystals shall be placed into the planting hole.
- After planting, the soil shall be replaced and carefully firmed, leaving a slight depression around each plant to allow for water collection. Soil is to be replaced in the hole so that the base of the stem is level with the soil surface, not set below the soil, or sitting above.
- All plants should be watered-in thoroughly after planting to settle any air pockets around the root ball of the plant and to give the plant a good initial supply of water.

3.3.3 Practical completion

Practical completion will be met at the completion of the planting program, with mulching completed, 100% of plants installed and watered.

3.3.4 Plant establishment

Plant establishment is to be achieved through watering, weeding, pest/disease control and replacing dead plant material over a 6month period following Practical Completion.

The VMP Contractor shall make provision for watering of plants with all plants watered thoroughly on at least 4 to 6 occasions, during the establishment period and as required during prolonged dry and hot conditions.

Plant establishment inspections and works shall be undertaken at intervals not exceeding two weeks or less as required.

Failure to maintain the revegetation zone in a stable and healthy condition may result in the VMP superintendent arranging for the maintenance work to be carried out by others at the expense of the VMP contractor.

Practical Completion shall require a minimum 85 per cent survival rate of each species planted and a maximum of 5 percent weed cover.

3.3.5 Planting maintenance

The maintenance period will commence on completion of the plant establishment period and continue for a period of 12 months, which will include completion of the defects liability period (see Section 2.3.5).

Maintenance includes watering, weeding, replacing dead plant material and any other requirements necessary to ensure a stable and healthy condition the VMP zone.

Maintenance inspections and works shall be undertaken at intervals not exceeding one month.

Maintenance Inspection Reports shall be submitted to the VMP Superintendent (or Principal) within four (4) days of each maintenance inspection.

The report must:

a. include the date of visit, maintenance works completed, maintenance works in progress and maintenance works required;

b. give details of damaged, dead or missing plants and show their locations on site plans;

c. include photographs for all photo points with associated notes where required to illustrate issues, etc; and

d. include herbicide application records

3.3.5 Defects liability

The Defects Liability Period shall be in force for 18 months after Practical Completion of the works or until the Site is stable, whichever is the longer period.

Any defective work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or of any other cause, shall be removed and replaced at the VMP contractor's expense by work or materials of the required standard.

3.4 Performance measures

Performance targets are necessary to objectively measure the progress and the achievement of the VMP objectives. The anticipated timing of VMP management activities and related performance measures are outlined below and in Table 3-1.

1) All weeds are to be continuously controlled on emergence using recognised appropriate bush regeneration methods in accordance with best practice.

2) All priority weeds and WONS are to be controlled on emergence and prevented from spreading.

3) Weed control and revegetation works are to be carried out by a qualified bushland regeneration contractor for a period of 2 years following practical completion.

4) Revegetation zones shall achieve a minimum 80%- 85% cover of native species planted (see Table 3-1).

Table 3-1. VMP implementation schedule

Task	Timing	Performance measure
Plant procurement	Minimum 4-6 mths pre-commencement of VMP implementation	Plants that are not: true to species; vigorous and healthy; with a well-developed root system; free from disease / pests; and are not without scars or dead wood; shall be rejected at delivery.
Completion of planting works	Practical Completion	• 100% of plants installed
Plant establishment	6 months	• Minimum 85% per cent survival rate of each species planted in all zones • Maximum 5% weed cover
Maintenance	6-18 months	• Minimum 85% per cent survival rate of each species planted in all zones • Maximum 10% weed cover
Defects Liability Period	18 months	

Task	Timing	Performance measure
Maintenance	18-24 months	• No patches of the VMP greater than 2m x 2m without any surviving natives or with significant erosion present
Handover	24 months	• The buffer zone will remain under the control and management of Aliro.

3.5 Monitoring and reporting requirements

The contractor will monitor the vegetation for changes over time. The objective of the monitoring and reporting program is to record changes to the vegetation because of vegetation management works.

The contractor will establish photo monitoring points and prepare reports to record the progress of their work and demonstrate compliance with the VMP.

Reports will include a brief work report and an annual audit and assessment of compliance with the performance criteria in Table 4. The requirements of monitoring and reporting are described in detail in the sections below.

3.5.1 Photo monitoring points

Photo monitoring points will be established across the VMP area to highlight changes in the vegetation through time. The initial photos must be taken prior to revegetation works commencing, with subsequent photos taken after major management actions are implemented (e.g. tubestock planting) and annually in Spring/Summer.

Photo monitoring points must be recorded using GPS (eastings and northerns) and magnetic north to ensure repetition is standardised.

3.5.2 VMP implementation reporting

A brief report outlining work undertaken by the contractor will be prepared every six months during the revegetation and primary weed control phases, then yearly throughout the maintenance phase. These reports will be submitted to the land holders committee and Sutherland City Council.

Reports will include:

+ The time period for which the report relates to;
+ A summary of works carried out within the period, including the dates and times spent on site doing works;
+ Methods of weed control undertaken, and chemicals used;
+ Photo monitoring results;
+ A description of any issues encountered in implementing the works;
+ Any observations made, including new plant species recorded (native and weed species), comments on rates of regeneration and any problems which impact on the implementation of the VMP; and
+ The results of the implementation work, in relation to the relevant performance criteria.

4. Planting schedule

Plant species selection is based on interrogation of Council's native plant selector tool for the Site's street address along with consideration of the following:

- Removal of species generated from the tool that are not appropriate to the conditions at the Site (i.e., wetland plants and lower saltmarsh species that require inundation or wet soils);
- A successional approach that includes additional species to those generated by the tool that includes hardier smaller shrub and groundcover species that are fast growing and good stabilisers (equally happy growing in a dune system) and reasonably tolerant of saline conditions; and
- Species tolerant of ephemeral conditions and local to the LGA that are also recommended for planting in the bioretention basin (basin).

Table 3-2 identifies plant selected for the various VMP zones, however this should not be considered a restrictive list.

Table 3-1. Planting species selection

Species name	Common name	VMP zones
Trees		
Acmena smithii	Lilly Pilly	4
Alectryon subcinereus	Native Quince	2, 4
Allocasuarina littoralis	Black She-Oak	4
Banksia integrifolia	Coast Banksia	4
Banksia serrata	Old Man Banksia	4
Causarina glauca	Swamp She-Oak	4
Eucalyptus botryoides	Southern mahogany	4
Eucalyptus robusta	Swamp Mahogany	4
Glochidion ferdinandi	Cheese Tree	4
Shrubs		
Acacia longifolia var sophorae	Coastal Wattle	2, 4
Acacia terminalis subsp angustifolia	Sunshine Wattle	2, 4
Banksia spinulosa	Hairpin Banksia	2, 4
Breynia oblongifolia	Coffee Bush	4
Callistemon citrinus	Scarlet Bottlebrush	4
Correa alba	Coastal Correa	2
Correa reflexa	Natve Fuschia	2
Kunzea ambigua	White Kunzea	2, 4
Leptospermum laevigatum	Coast Tea Tree	2, 4
Myoporum acuminatum	Boobialla	2, 4
Viminaria juncea	Native Broom	2, 4
Westringia fruticosa	Coastal Rosemary	2, 4
Leucopogon parviflorus	Coastal Beard Heath	2, 4
Grasses / Sedges / Grasslike		
Carex appressa	Tall Sedge	Basin
Carex pumila	Dwarf Sedge	2

Species name	Common name	VMP zones
Dianella caerulea	Blue Flax-lily	2, 4
Dichelachne crinita	Longhair Plume grass	2, 4
Ficinia nodosa	Knotted club-rush	2, 4, basin
Imperata cylindrica var. *major*	Blady Grass	2, 4, basin
Juncus kraussii	Sea Rush	2, 4, basin
Juncus usitatus	Common Rush	Basin
Lomandra longifolia	Spiny Mat-rush	2, 4
Machaerina juncea (syn. Baumea juncea)	Bare Twig-rush	Basin
Oplismenus aemulus	Basket Grass	2, 4
Poa labillardierei	Tussock-Grass	2, 4, basin
Spinifex sericea	Spinifex	2
Sporobolus virginicus	Salt Couch	2, 4, basin
Herbs/Forbs		
Carpobratus glaucescens	Pigface	2
Dichondra repens	Kidney Weed	2, 4
Pratia purpurascens	White Root	2, 4
Scaevola calendulacea	Dune Fan-flower	2, 4
Scaveola albida	Pale Fan-flower	2, 4
Suaeda australis	Austral Seablite	2
Tetragonia tetragonoides	New zealand Spinach	2
Vines		
Cissus hypoglauca	Water Vine	2, 4
Hardenbergia violacea	False Sarsaparilla	
Hibbertia scandens	Climbing Guinea Flower	
Kennedia rubicunda	Dusky Coral Pea	
Stephanica japonica var *discolor*	Snake Vine	

Table 3-3 identifies the proportions of each zone that requires mulching or jute mapping and Table 3-4 identifies the planting densities and quantities that are estimated for the various VMP zones.

Table 3-2. Pre-planting

Zone	Planting area (m^2)	Mulch %	Mulch (m^2)	Jute %	Jute area (m^2)
1) Existing vegetation retained	0	0	0	0	0
2) Transmission easement	1,303	50	651	30	391
3) All plantings	2,721	80	2,177	0	0
4) Bioretention	510	0	0	0	0
Subtotals	**4,534**		**2,828**		**391**

Table 3-3. Indicative planting densities and quantities

Zone	Area (m^2)	Trees (1/7m^2)	Shrubs (1/2m^2)	Groundlayer (6/m^2)	Vines (1/5m^2)	Subtotals
2)	1,303	0	651	7,818	261	8,730
3)	2,721	390	1,361	16,326	544	18,621
4)	510	0	0	3,060	0	3,060
Subtotals	**4,534**	**390**	**2,012**	**27,204**	**805**	**30,411**