

Landscape Concept Plan & Visual Assessment

For: BBK Development Corporation Pty Ltd

Project: Proposed 43 Lot Subdivision
45 Hearnese Lake Road
Woolgoolga NSW

September 2007



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Introduction

A landscape concept plan has been prepared for the proposed 43 Lot residential subdivision at 45 Hearn's Lake Road (Lot 21 DP 714858). This concept plan is integral to the subdivision successfully meshing within the surrounding coastal landscape. The concept plan is mindful of the area's ecosystem, desirability and proximity to a stunning beach and estuary. This development offers potential benefits to the improvement in landscape quality of the area by reintroducing the planting of indigenous heath land and grassland species into the urban fabric of the development. Species diversity also has the potential to be strengthened by introducing a proactive program to guide indigenous planting both within common open space areas and individual Lot front yards.



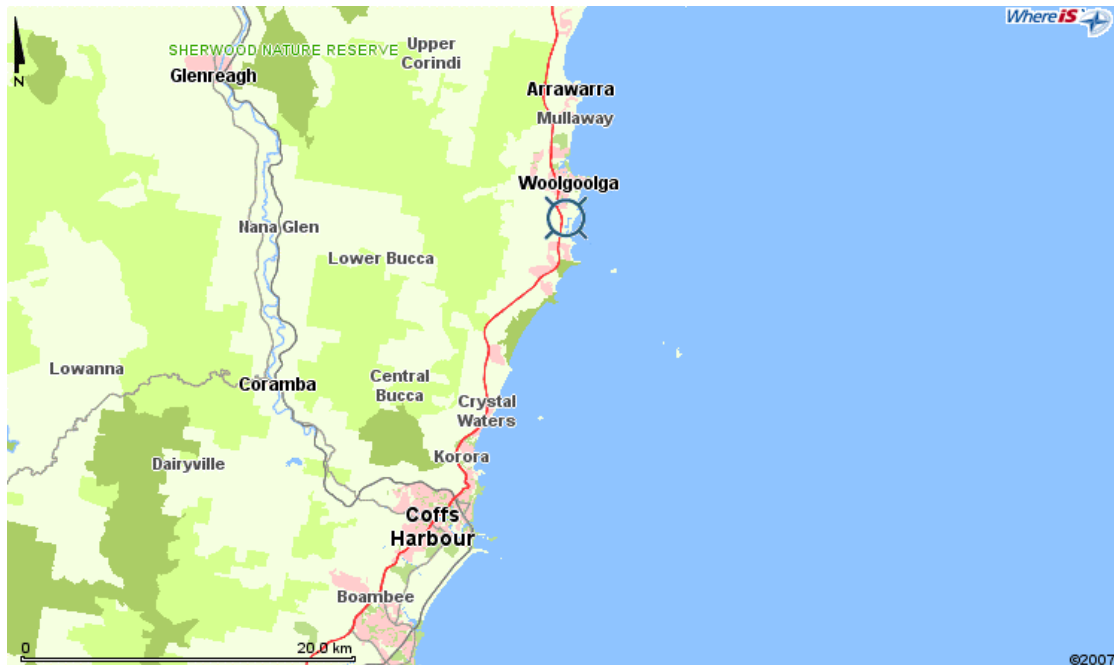
Typical landscape characteristics of site with predominantly *Themeda australis* grasslands with some clumps of remnant trees on lower slopes.

Aims

- To provide a landscape concept plan that enables residential subdivision to occur within an ecologically sound framework.
- To utilise indigenous species within the planting plan
- To protect areas of high conservation value
- To undertake a view analysis and visual assessment to determine the potential impacts on visual quality of the Hearn's Lake Area.
- To be in keeping with State and Local Government planning requirements and guidelines for the Hearn's Lake area
- To provide structured and logical pedestrian access to Hearn's Lake Beach and the existing picnic area
- To integrate the proposed development into the surrounding landscape with as much sensitivity as possible
- To utilise water sensitive urban design to facilitate ecologically sustainable ways of dealing with stormwater.
- To provide positive solutions to improve landscape quality of the subdivision. For example increased planting will strengthen the ecology and visual screening capacity of open space areas.

Location

The site is located a kilometre south of Woolgoolga and 20km north of Coffs Harbour. The site sits approximately 100 metres north of the mouth of Hearnese Lake and 250 metres west of the nearest beach and 500 metres east of the Pacific Hwy.



source: <http://www.wheris.com/wheris/confirmedMap.do?nref=homeMap>

Site Description

The site comprises 5.54 ha of land, is zoned 2E Residential Tourist and is bounded to the west and north by 2E Residential Tourist zone, with a 7A Environmental Protection – Habitat and Catchment zone to the east and 6A Open Space Public Recreation to the south.



The majority of the site is characterised by open grassed slopes. There are remnant trees scattered over the property with the understorey being highly modified and containing numerous native and introduced species. Trees located on the upper slopes are stunted due to wind shear (refer photo). The main remnant overstorey species include *Melaleuca quinquenervia*, *Casuarina glauca*, *Eucalyptus tereticornis* and *Banksia integrifolia*. The main remnant understorey species is *Themeda australis*. Views are spectacular from the high point of the site extending to a 360° panoramic sweep of ocean and hinterland. The ephemeral wetland in the northeast corner is an interesting and unique asset to the landscape. It contains and is surrounded by

wetland heath species. Its enclosure by the surrounding topography affords it an intimate and peaceful character.



Photo displays proximity to ocean and the vegetation cover that surrounds the site aiding in its ability to absorb development. Source: Coffs Harbour City Council

Relevant Planning Controls and Issues

This landscape concept plan is consistent with state planning requirements under the Environmental Planning and Assessment Act 1979 (State Environmental Planning Policy No 71 – coastal protection)

Public access to the coastal foreshore area is improved via a structured route. A formed gravel track will direct access internally down to the existing facilities and pathways at Hearn's Lake.

Scenic quality of the area is protected mainly due to the fact that the site is not highly visible from any public use area other than from the immediate viewing point of Hearn's Lake Road as one enters the proposed estate. (Refer visual assessment discussion for detail page 6). The combination of topography and vegetation cover screens the majority of the site from any external viewing point. It is expected that street tree planting and planting within the drainage detention reserve will also help screen and filter views of housing.

Water quality – the treatment of water runoff is above minimum standard requirements (refer WBM Oceanics Australia, Solitary Beach Stormwater Quality Management, May 2006) and the design solutions expressed in this document have numerous ecological and environmental benefits. Excess water from lots and runoff from roads will be sent into a series of bio filtering areas prior to leaving the site, ensuring that water quality leaving the site is the highest possible achievable.

The landscape Plan is in keeping with the aims and direction and content laid down by the Coffs Harbour City Council in its **Development Control Plan – Hearnese Lake / Sandy Beach**. The subdivision as proposed seeks to protect environmentally sensitive areas and provides buffers of “no development” where required to adhere to bushfire and predicted flood events. A perimeter track around the wetland combined with fencing aims to protect the ephemeral wetland in the northeast corner of the site. Eco Logical Australia Pty Ltd in their Flora and Fauna Assessment Report, July 2007 makes recommendations for the protection and improvement of this area, and this Landscape Plan is in keeping with their intentions.

Native vegetation will be retained wherever possible, indigenous vegetation will be strengthened and a weed control program will be instigated throughout the site.

The one **threatened species**, *Thesium australe* (Austral Toadflax) has been identified and measures taken to ensure its continued occupation of the site. Refer Open Space Network Plan No. 99-07-2 page 12, for location of *Thesium australis* plants. The Flora and Fauna study by Eco-logical Australia Pty Ltd, July 2007, suggests strategies to ensure the plant species remains a viable entity within the proposed subdivision. These include retaining areas within the Ephemeral Wetland Reserve & road easements of the estate and also collecting seed and plants to establish new communities within the Ephemeral Wetland Reserve. The recommendations of the Eco Logical Australia Pty Ltd report are supported by this Landscape Plan and incorporated into it.

Coffs Harbour City Council maps a small pocket of Secondary **Koala Habitat** to the west of the site on an adjoining property. This vegetation will be retained as part of a proposed 7A zoning. These trees play an important role in visually screening the proposed subdivision from the Pacific Highway and Hearnese Lake Road, so their retention is an added benefit to maintaining the landscape quality and character of the area.

The site has prescribed **Asset Protection Zones**. This means that there are “no build areas” adjacent to the boundaries that improve the capability of the site to visually contain housing development. The APZ also means that any planting within the zone cannot have connective canopies. Fuel reduction mechanisms must also be written into management prescriptions for public open space areas. This landscape plan recommends that a detail landscape plan and Vegetation Management Plan for the site be undertaken that incorporates all measures required to ensure bushfire safety.

Visual Assessment - View Analysis

A visual assessment of the site was undertaken to determine the potential visual impact of the proposal. Visual impact is an assessment of the physical characteristics of the site (absorption capacity). Typically the more undulating the slopes and the more vegetated they are the better the landscape is at absorbing visual change. The absorption capacity is then combined with how likely and often the site is to be seen by the general public to determine the overall visual impact.

Visual Assessment - Internal

As one enters the site along Hearnese Lake Road approximately two thirds of the site is opened up to view. The remnant trees on the lower slopes give a filtered view up to the ridgeline.

From the high point of the site a 360° panoramic view is opened up over the Coffs Coast hinterland and the Pacific Ocean. Neighbouring properties are visible to the immediate north as is the industrial area of Woolgoolga.

Internally most of the site is currently open in nature and therefore views are obtained around the site with the exception of the ephemeral wetland.

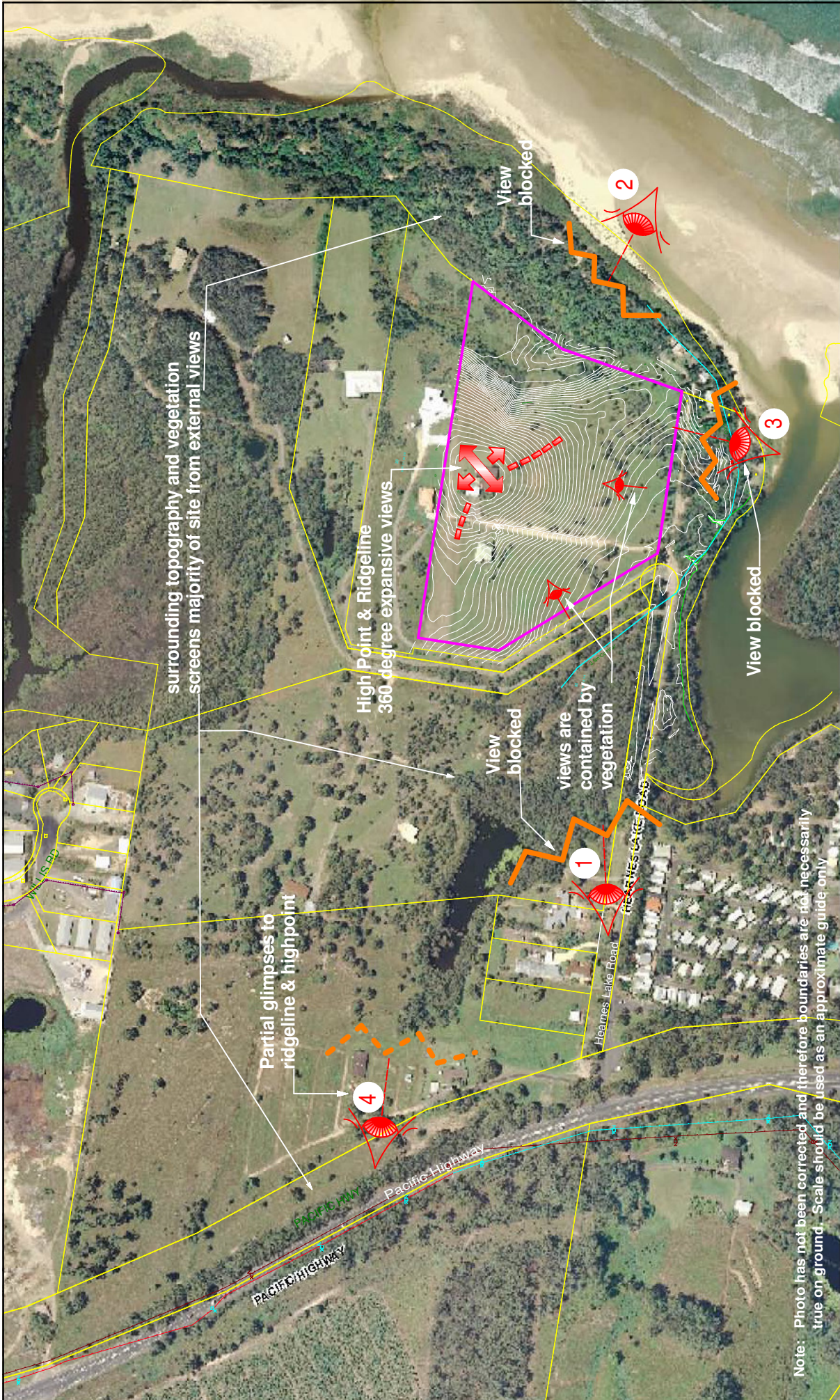
The ephemeral wetland is only visible from the ridgeline and cannot be seen from the majority of the site or from any public external viewing points.



Sweeping view obtainable from the sites high point over vegetated dunal system towards the Solitary Islands Marine Park. Groper Island is visible in the distance

Views to surrounding properties, Woolgoolga and surrounding hinterland






Note: Photo has not been corrected and therefore boundaries are not necessarily true on ground. Scale should be used as an approximate guide only

Client: BBK Development Corporation Pty Ltd

Project: Proposed 43 Lot Subdivision
45 Hearnes Lake Road
Woolgoolga

Plan: Landscape Concept Plan
Visual Assessment

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|  | drawing no | 99-07-1 |
| | scale | 1 : 5000 approx |
| date | Sept 2007 | amended |
| drawn | A Harrison | sheet size |
| | | A 4 |

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Visual Assessment - External

An external view analysis was conducted from Hearnese Lake Road (view point 1), Hearnese Lake Beach (view point 2), Hearnese Lake picnic area (view point 3) and along the Pacific Highway (viewpoint 4). These are the four public locations to which alterations to the site may be potentially viewed. Refer Visual Assessment Plan No. 99-07-1, page 7, for viewpoint locations.

View Point 1 – Along Hearnese Lake Road

From Hearnese Lake Road views to the site are entirely screened by the area of vegetation growing in association with an adjoining low lying property. This vegetation is to be zoned 7A Environmental Protection by Coffs Harbour City Council as shown in the Hearnese Lake / Sandy Beach Development Control Plan. This vegetation is also mapped as Secondary Koala Habitat and will be maintained if not strengthened by future management regimes. The retention of this vegetation guarantees that the development will always be afforded screening from Hearnese Lake Road and the Pacific Highway.



View taken from Hearnese Road/Pacific Highway turnoff. Roadside planting and vegetation in middle ground screens the site from view

View half way along Hearnese Lake Road with view into site completely screened by vegetation



Site begins to open up to view only at entrance point

View Point 2 – Hearnese Lake Beach

Due to a combination of topography and vegetation the site cannot be seen from Hearnese Lake Beach, therefore there is no assessable impact of the proposed subdivision. This will not change in the future, as the land in front of the subdivision is either protected as part of the Coffs Coast Regional Park network or as part of the Marine Solitary Islands National Park.



A series of viewpoints taken from Hearnese Lake beach. The topography of dunes combined with vegetation totally obscures any views of the site.





A distant view taken from Hearnese Lake Beach over the Lake and up towards the site. Day visitor area and leasehold lots are visible but the site is still not apparent even from a distance.

View Point 3 – Hearnese lake Picnic Area

Due to a combination of topography and vegetation the proposed subdivision cannot be viewed from this location. Filtered views from the upper car park area are possible. It will be important to retain existing vegetation and perhaps strengthen this planting to ensure the impacts of the subdivision are minimised in and around the day visitor area. It is not part of this proposal however to put forward plans for the car park and picnic area as it is under State and Local Government management control and beyond the scope of this Landscape Plan.



Views from Hearnese Lake Day Picnic Area up towards the site, which is screened from view



View Point 4 – Pacific Highway

Filtered views of the high point and ridgeline of the estate are visible at fleeting moments along the Pacific Highway. It is expected that rooflines along the ridgeline will be partially visible from the Pacific Highway but that the impact of this change will not be dominant or in anyway change the essential character of the view as it is experienced now.



Camber on road combined with roadside vegetation screens view of site. Glimpses of ridgeline and rooflines will be visible from highway but alterations to skyline will not dominate view.

Visual Absorption Capability

The site has some steep slopes that will require sensitive building design to nestle any building development into the topography. The sites visual absorption capacity is low to moderate, as the steep slopes combined with lack of vegetation mean that any form of development will be apparent. The containment of the site on the western boundary by vegetation will help visually contain development within the property. Street tree planting and the proposed detention basin area in the south west corner of the property will also be important to giving a soft vegetated character to the estate. Based on absorption capability alone, development on the site would have a moderate to high impact, however because the site is not readily visible from external areas the overall visual impact is low to moderate.

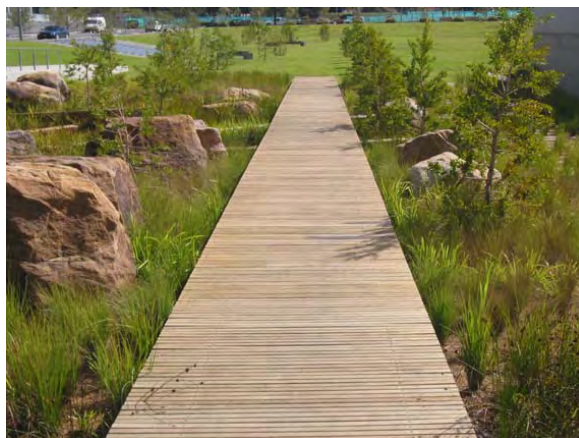
Visual Impact

The site has low to moderate visual impact essentially because it cannot be readily seen from any public use areas. Buildings on the ridgeline have the potential to be visually prominent only when viewed internally within the estate or far out to sea.

Open Space Network - Landscape Treatment

Overall Character and Intent

The landscape intent of the project is to retain the relaxed natural coastal setting of the Hearnese Lake area. New landscape features aim to strengthen the existing tree cover, facilitate healthy water quality and utilise indigenous plants within the open space network. Colours and materials utilised within the estate are sympathetic to the existing natural character of the area.



Photos depict the character, plants, material and overall look of public open space and access developments within the proposed subdivision. Colours of existing native plants will dominate, rocks and boulders will be used to accentuate natural feel. Walkways and bridges will also utilise materials and colours designed to blend with surroundings.

Open Space Network

The Open space network of the site can be broadly divided into 4 categories. Refer Open Space Network Plan No. 99-07-2, page 13 for location and layout of open space areas.

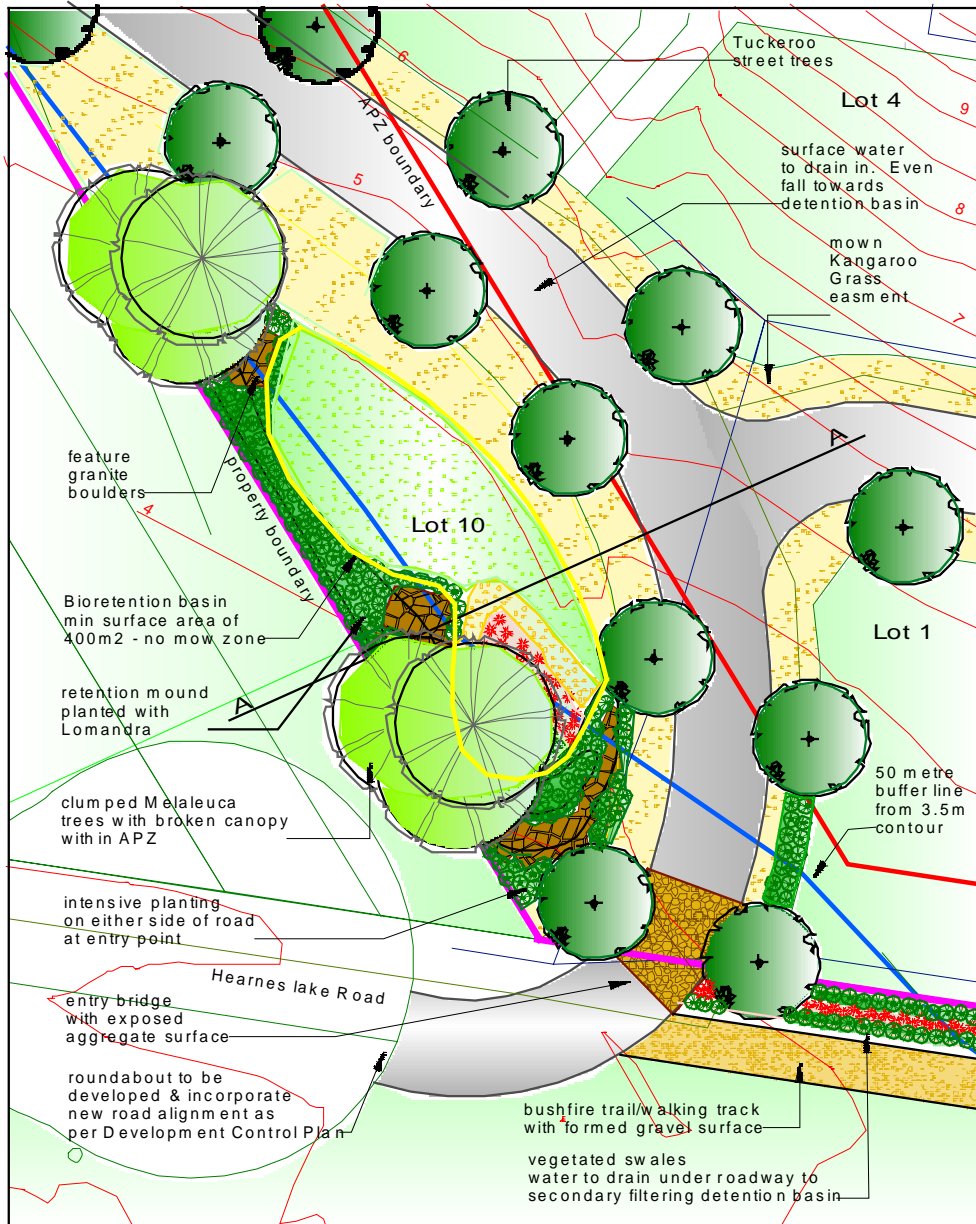
Category 1

Bioretention Basin (Drainage Reserve)

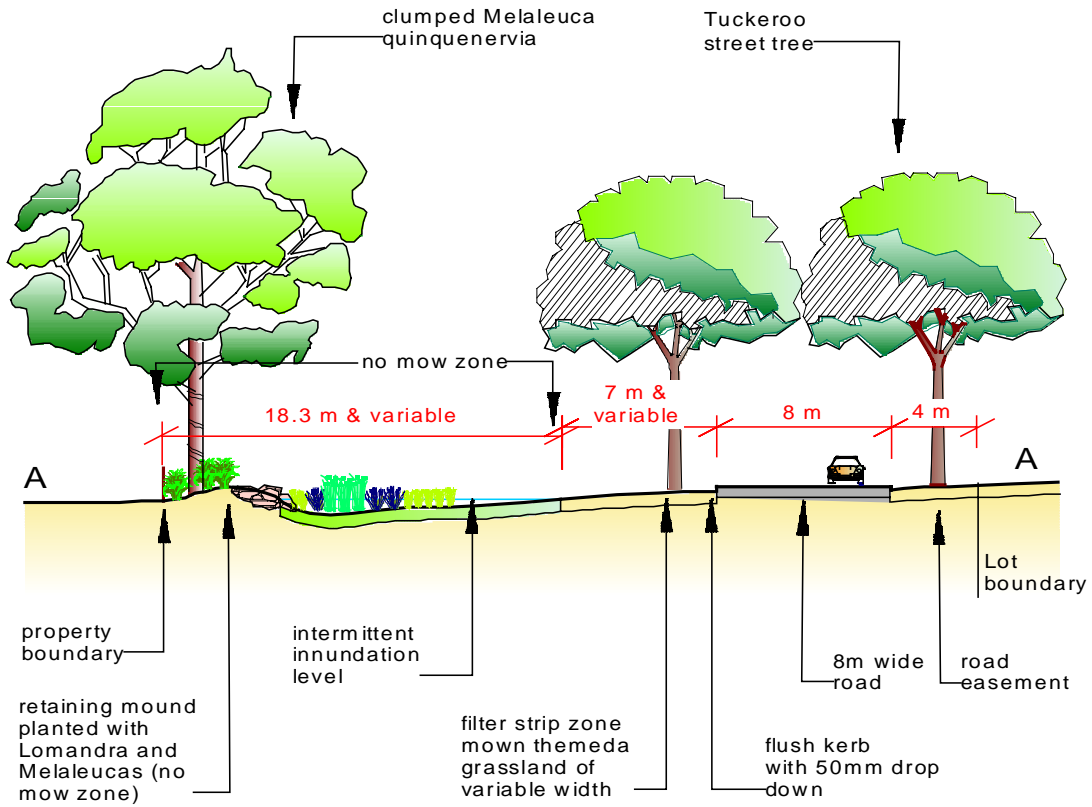
This area will be intermittently inundated during high water flow events but essentially remain as a dry collection area for all stormwater prior to leaving the site. This area is the entry point to the estate and it is envisaged that planting and landscaping around the detention basin will help screen views up to the residential lots. The features of the entry include mounding, some rock/boulder edging, intensive foliage planting, clumped Melaleuca trees and a small concrete entry bridge. This area is located within a 20-metre wide bushfire buffer. It will be constructed as part of the civil works program and have a five-year maintenance and costing plan devised so that its dedication as public land under Coffs Harbour City Council management can be facilitated. A comprehensive planting plan and weed control program will ensure the detention basin is established successfully.



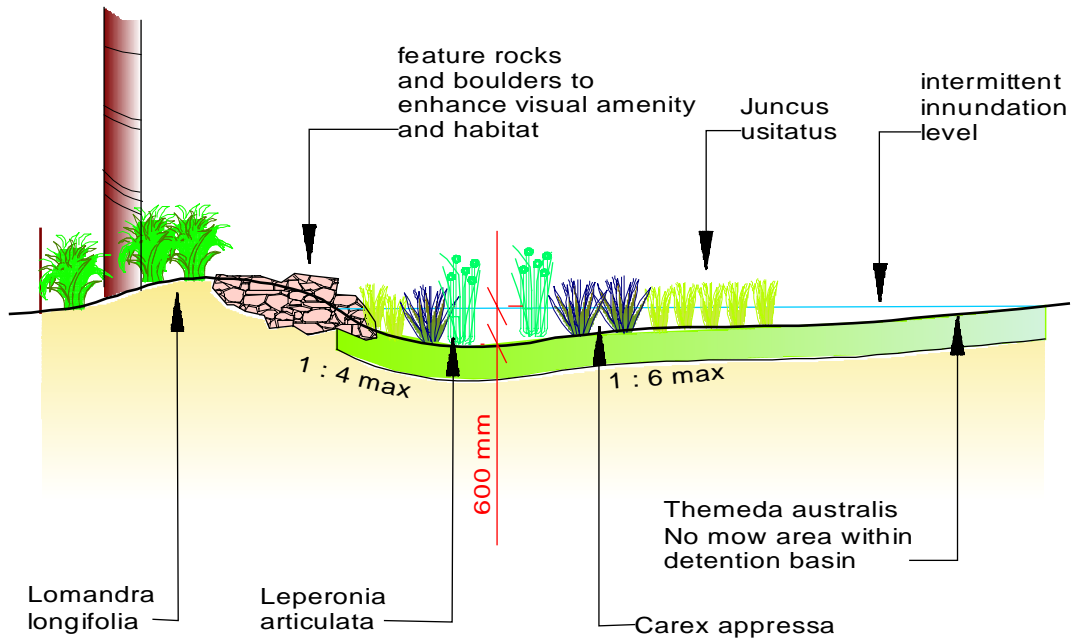
The detention basin will be a focal point for the entry to the estate. The look will be semi formal and utilise native wetland species surrounded by an initial filtering area of mown *Themeda australis* grasslands with clumps of Melaleucas.



Detention Basin Reserve – Typical Treatment



Section AA Road Reserve and Detention Basin – Typical Treatment



Detention Basin – Typical Vegetation Composition

Category 2 Vegetated Swales

Refer Open Space Network Plan, page 13 for locations of swales.

These areas serve a bio-filtering role and are located within road reserves to collect runoff and overflows from residential allotments. Water within the proposed subdivision is firstly directed into these swales to remove contaminants and slowly filter down towards the detention basin. The swales will be 3 metres wide shallow depressions planted with indigenous sedges, *Lomandra longifolia* will be planted on batters and be edged by *Themeda australis* filtering buffer strips. The swales will be no mow – low maintenance zones.



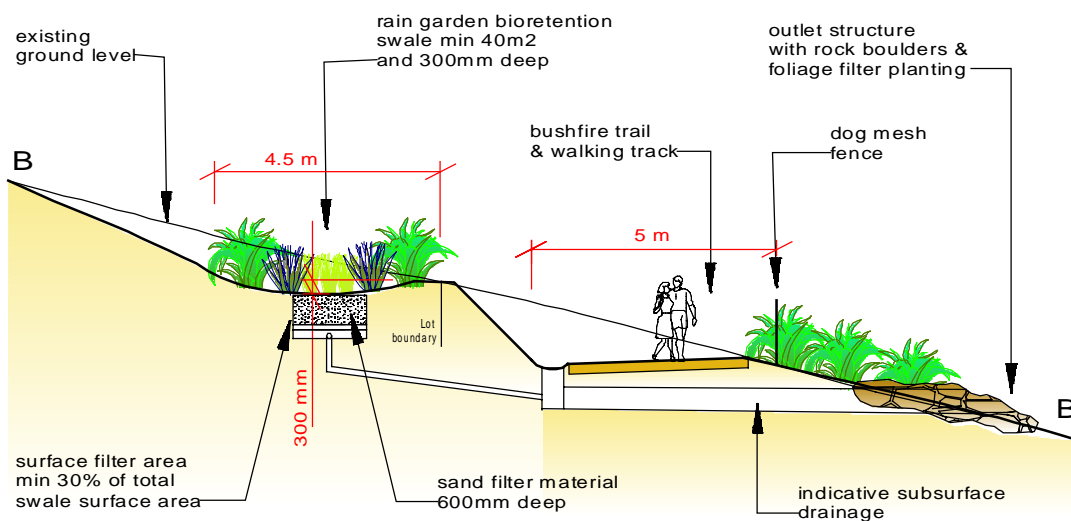
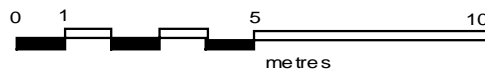
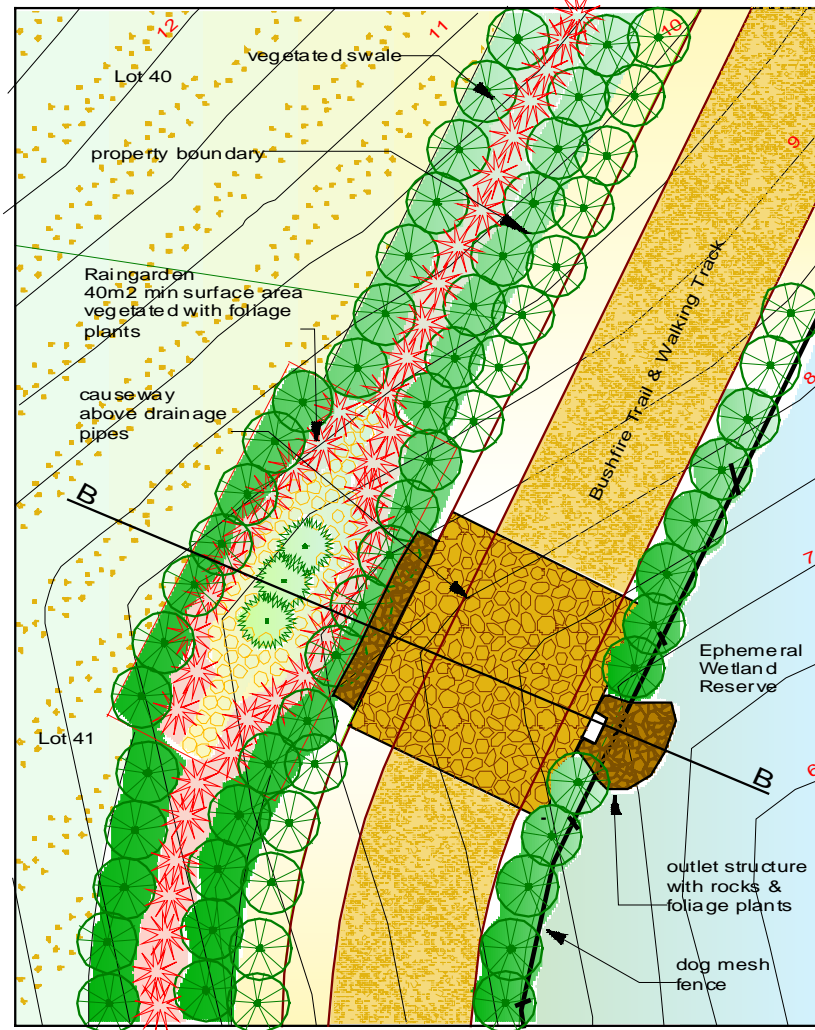
Swales will have Kangaroo grass filter strip with a 3 metre wide swale planted with native species

Category 2.1 Vegetated Bioretention swale – Rain Garden

Refer Open Space Network Plan page 13 for locations of rain gardens.

Rain gardens act as miniature detention basins. They are placed where two existing minor overland flow collection routes drain water into the ephemeral wetland. Their aim is to detain and filter water from allotments prior to it draining into the wetland catchment. This measure will ensure water quality is high and that existing patterns of water drainage is maintained into the wetland basin.

Rain Garden, Swale and Bushfire Trail / Walking Track



Section BB Rain garden & Bushfire / Walking Track

Category 3 Ephemeral Wetland Reserve

The ephemeral wetland is an important ecosystem in its own right. Dedicating this area as a reserve will ensure it can continue to operate unaffected by the subdivision. The reserve itself will operate as an added buffer to the ecologically sensitive areas of the dune system and Littoral rainforest area to the north and east, outside of the development site. The wetland will be fenced off from the adjoining proposed residential area using a dog mesh and timber post and rail fence. Public access will be directed away from this sensitive zone via a gravel track down towards the existing Hearn's Lake day visitor area and beach. This track will be an added barrier, separating residential lots from a natural reserve in keeping with requirements of the Hearn's Lake / Sandy Beach Development Control Plan.

Ultimately the proposed subdivision seeks to dedicate the ephemeral wetland reserve area back to Coffs Harbour City Council to be incorporated into the Coffs Coast Regional Park and it is recognised that a detailed Vegetation Management Plan will be required for this area at a later stage. A VMP will prescribe specific maintenance and costing for a five-year period and will incorporate recommendation as made by Eco-logical Australia Pty Ltd in their Flora and Fauna Assessment, July 2007, report. Through this process weeds will be removed, sensitive areas will be securely protected, native vegetation strengthened and an active program to encourage the growth of *Thesium australe* will be facilitated.



The wetland may benefit from interpretive material being installed in association with the adjoining walking trail.



Post and rail fence with galvanised dog mesh attached. This style of fencing will be installed to protect the ephemeral wetland from suburban lots and uncontrolled human/pet access.

Category 4 Road Easements

These areas will contain footpaths, bollards, filter strips, swales, and street tree planting. Street trees will be a combination of *Cupaniopsis anacardioides* (Tuckeroo) and *Melaleuca quinquenervia* (Broad-leaved Paperbark) and utilise Kangaroo grass as the predominant understorey species to best replicate the existing headland plant community.



Themeda grasslands will be used on easements and act as filter strips for stormwater prior to it entering swales. A specific mowing regime that controls mowing heights and the time of year to mow will be incorporated into a detailed management plan for the subdivision. Kerbing within the development will allow a dissipated

even flow of water to enter swales.

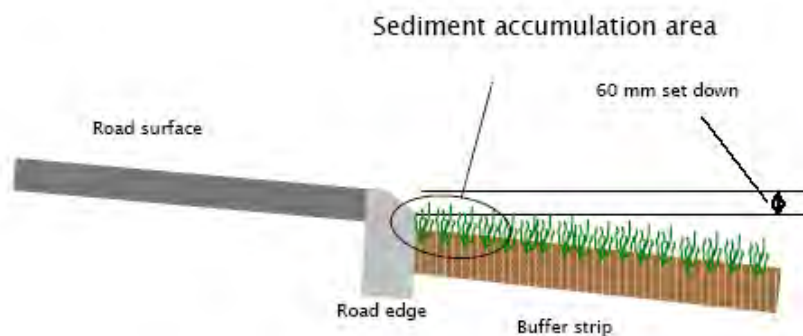


Diagram detailing kerb drop down to avoid sediment build up in filter strip zone
Source: WSUD Engineering Procedures Stormwater, CSIRO, 2005

Pedestrian Route – Walking Track

Refer Open Space Network Plan page 13 for locations of pedestrian route.

Pedestrian movement is encouraged along road easements through the placing of concrete footpaths within the estate. Links will be created to Hearn's Lake day picnic area and beach utilising existing access routes. The fire trail which doubles as a walking track will afford pedestrians views over the wetland/dunal system but lead them away from crossing sensitive areas. The track will be a minimum of 3 metres wide with a formed gravel surface. Any crossing of swampy areas will be done via raised structures to avoid damage and enable normal runoff patterns to continue unheeded.

Insert picture of track

Typical House Lot – Front Garden Planting

To aid in the retention of the existing coastal character it is proposed that a covenant be put on the sale of lots which stipulates the use of indigenous plant species to be used in the landscaping of the front yard. Species to be utilised would include those listed in the plant species list, refer page 22.

Front yards will aim to utilise local and aesthetically complimentary plants including; Coastal Banksia, Swamp Oak and Lomandra longifolia and Lomandra multiflora

Plant Species Selection

The following list details plants found on site that may be utilised in open space areas and front gardens. The selection is taken from a species list prepared by Eco Logical Australia Pty Ltd as part of their Flora & Fauna Assessment, July 2007.

It is recommended at the construction stage that a local propagator be contacted to grow seedlings for future sale and distribution throughout the estate.

All plants are indigenous to the area; they can be used in open space planting, road easements, front gardens, compensatory planting if required as well as in the planting of a vegetation buffer around the ephemeral wetland.

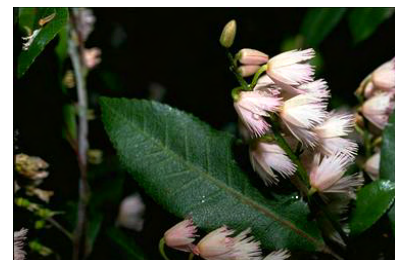
| Botanical Name | Common Name | Height | Spread |
|---|------------------------|--------|--------|
| Trees | | | |
| <i>Acronychia imperforata</i> | Beach acronychia | 8m | 5m |
| <i>Banksia integrifolia subsp integrifolia</i> | Coast Banksia | 12m | 4m |
| <i>Casuarina glauca</i> | Swamp Oak | 18m | 7m |
| <i>Corymbia intermedia</i> | Pink Bloodwood | 30m | 17m |
| <i>Cupaniopsis anacardioides</i> | Tuckeroo | 13m | 9m |
| <i>Cryptocarya triplinervis var. triplinervis</i> | Three-veined Laurel | 15m | 10m |
| <i>Elaeocarpus reticulatus</i> | Blueberry Ash | 15m | 8m |
| <i>Eucalyptus robusta</i> | Swamp Mahogany | 15m | 10m |
| <i>Eucalyptus tereticornis</i> | Forest Red Gum | 30m | 20m |
| <i>Ficus coronata</i> | Sandpaper fig | 15m | 5m |
| <i>Lophostemon suaveolens</i> | Swamp Turpentine | 10m | 5m |
| <i>Melaleuca quinquenervia</i> | Broad-leaved Paperbark | 25m | 18m |
| <i>Persoonia stradbrogensis</i> | Broad-leaved Geebung | 10m | 8m |
| <i>Syzygium australe</i> | Brush Cherry | 18m | 6m |
| <i>Syzygium smithii</i> | Lilly Pilly | | |

| Botanical Name | Common Name | Height | Spread |
|--|--------------------------|-------------|--------|
| Shrubs | | | |
| <i>Acacia longifolia subsp. Sophorae</i> | Coast Golden Wattle | 3m | 4m |
| <i>Babingtonia angusta</i> | Twiggy Baeckia | 2.5m | 2m |
| <i>Breynia oblogifolia</i> | Coffee Bush | 2m | 1.5m |
| <i>Chorizema parviflorum</i> | Eastern Flame Pea | prostrate | |
| <i>Goodenia paniculata</i> | Panicled Goodenia | herb | |
| <i>Jacksonia scoparia</i> | Dogwood | 4m | 2m |
| <i>Notelaea longifolia</i> | Large Mock-olive | 8m | 3m |
| <i>Pimelea linifolia</i> | Common Riceflower | .6m | .3m |
| <i>Pittosporum revolutum</i> | rough Fruit Pittosporum | 3m | 2.5m |
| | | | |
| <i>Eustrephus latifolius</i> | Wombat Berry | climber | |
| <i>Parsonia straminea</i> | Ivy Silkpod | climber | |
| | | | |
| <i>Polymeria calycina</i> | Polymeria | groundcover | |
| <i>Pratia purpurascens</i> | Whiteroot | groundcover | |
| <i>Viola hederacea</i> | Ivy-leaved Native Violet | groundcover | |

| Botanical Name | Common Name | Height | Spread |
|--|------------------------|--------|--------|
| Foliage Plants | | | |
| <i>Dianella caerulea</i> | Blue Flax Lily | .4m | .5m |
| <i>Lomandra longifolia</i> | Long-leaved Mat-rush | 1.5m | 1.3m |
| <i>Lomandra multiflora ssp. Multiflora</i> | Many-flowered Mat Rush | 1m | .5m |
| <i>Themeda australis</i> | Kangaroo Grass | | |

| Botanical Name | Common Name | Height | Spread |
|-------------------------------|----------------|--------|--------|
| Wetland Plants | | | |
| <i>Baumea juncea</i> | Grey Twig Rush | | |
| <i>Carex appressa</i> * | Sedge | 1m | 1m |
| <i>Eleocharis sphacelata</i> | Tall Spikerush | 1.5m | 2m |
| <i>Juncus usitatus</i> * | | .8m | .3m |
| <i>Leperonia articulata</i> * | | 2m | 1m |
| <i>Zoysia macrantha</i> | Prickly Couch | | |

* Plants are native to the mid-north coast but do not occur within the site boundaries.



Selection of colours and textures of proposed plants

Monitoring & Maintenance

For this Landscape Concept Plan to succeed there will need to be defined measures in place to monitor the successful establishment of plants and the removal of weeds. There will also have to be a program of seed collection and plant propagation that is carefully timed in conjunction with civil construction works.

Due to the unique nature of landscape treatment and the fact that a greater part of the landscape treatment is actually an effort to replicate current plant communities, bush regeneration/revegetation contractors with knowledge of local flora should be employed to oversee the landscape establishment and maintenance program. In this way, appropriate management regimes can be applied to specific landscape areas.

Management in the long term of open space areas will be under the jurisdiction of Coffs Harbour City Council. Landscape works and Vegetation Management works for this subdivision will have a five-year, fully costed maintenance schedule adopted as part of their program.