

Date: 15 December 2016
Your Contact: Emma Moller
Our Contact: Kieran Richardt
Our Reference: NCO11-0011

**PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL**

Approval no: DEV2016/821
Date: 23 June 2017



Ecological Consulting
Environmental Planning
Environmental Management
Community Engagement Services

**Precinct 3B and Precinct 3C Ecological Compliance
Certification, Yarrabilba. Consistent with Precinct 3 Context
Plan Area Strategy (CPAS), Fauna Corridor Infrastructure
Master Plan, Natural Environment Overarching Site Strategy,
EDQ Guidelines No. 14, No. 17 and No.18 and previous review
of Precinct 3**

- Baseline Ecological Studies
- Environmental Project Management
- Management Plans for Flora & Fauna
- Regional Ecosystem Assessments
- Ecological Assessments
- Bushland Rehab & Regen Planning

Dear Emma,

This letter outlines our support and certification of compliance for the layout for Precinct 3B and Precinct 3C, as designed by Lendlease. In our view, the layout considers the constraints set out in the above mentioned documentation and correspondence, and addresses Lendlease's requirements relating to ecological constraints on the site.

In addition to the above, the Precinct 3 Context Plan also complies the constraints set out in the CPAS documentation and addresses the Lendlease requirements related to remnant vegetation, Koala offsets, fauna / road crossings and setbacks between the development footprint and fauna corridors, conservation areas, waterways, bushfire radiation zones and greenspace corridors.

As part of our assessment, the plan was reviewed against the following documents:

- ROL and POD plans;
- Landscape concept designs;
- Natural Environment Site Strategy: Yarrabilba, approved 22 April 2016;
- Fauna Corridor Infrastructure Master Plan: Yarrabilba, approved 15 February 2013;
- Environment and Natural Resources Sustainability: EDQ Guideline No. 14;
- Remnant Vegetation and Koala Habitat Obligations in Greater Flagstone and Yarrabilba UDA's: EDQ Guideline No. 17;
- Development interfaces – EDQ PDA Guideline No. 18; and
- Previous assessments of the Precinct 3 proposed layout.

Natura Consulting supports the Lendlease Yarrabilba Precinct 3B and Precinct 3C layout because it complies with guidelines through the incorporation of the following planning principles:

- Key areas of urban development are primarily located in areas of former pine plantation, grassland areas, acacia regrowth and areas deemed to have lower overall habitat value;
- Provision of ecological corridors that link with larger patches of vegetation for this precinct and future precincts, buffers to protect waterways and corridors to provide for fauna movement throughout the site and adjoining ecological areas;
- Protection of areas mapped as Regional Ecosystem;
- Protection, translocation or propagation of listed Endangered, Vulnerable or Near Threatened flora within the Precincts;
- Initial fauna crossing concepts comply with basic fauna movement requirements whereby the preferred opening of culverts for fauna passage is included in the design (two 3 m x 2.4 m culverts). These are located away from low flow channels to ensure dry passage throughout the majority of the year. Further detailed design will be required to ensure:

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- appropriate length of passages;
- use of skylights (where applicable);
- rough surfaced / natural base;
- entry / exit points are rehabilitated to encourage fauna use.
- Protection of mapped Regional Ecosystems and Essential Habitat which contains a number of significant sized trees and areas of suitable Koala habitat.

Natura Consulting has also provided a summary of recommendations below, as outlined within the Natural Environment Overarching Site Strategy and Fauna Corridor Infrastructure Master Plan. Together the implementation of the concept plan and recommendations from the above plans will ensure that the principles and requirements of EDQ Guidelines 14, 17 and 18 are met.

Recommendations for Precinct 3B and Precinct 3C:

- With exception to crossings or linear infrastructure, the final earthworks will need to remain outside of the Fauna Corridors and Koala Habitat and Offset areas;
- All vegetation buffers, corridors and linkages are identified and protected during construction by installing vegetation protection / safety fencing and sediment control fencing to meet Australian Standards;
- Flora management: where practical, restoration works are to include EVNT listed species in planting pallets;
- Fauna management: Fauna friendly design aspects are incorporated, such as using food and shelter trees in parks and street scapes and use of fauna friendly fencing;
- Detailed design of fauna crossings and underpasses are in accordance with requirements set up in the Natural Environment Site Strategy and Fauna Corridor Infrastructure Master Plan, specifically:
 - Install one-way directional fencing and climb poles along the top of fauna underpass entrances, parallel to the road crossing;
 - Placement of lighting is strategic, whereby it is away from remnant vegetation and water bodies focusing on main arteries of infrastructure where faunal movement is likely to be reduced;
 - Despite the efficiency of LED lighting this should be avoided as these bulbs emit light in the blue end of the spectrum which is the most detrimental to natural melatonin cycles in animals. These lights disrupt sleep patterns, breeding cycles and cause behaviour changes especially in mammal species such as Koalas and wallabies. As an alternative, the new metal halide lamps are among the most efficient in energy conservation and emit light in the more yellow spectrum. If used with green bulbs these can be a very good way of reducing faunal impact;
 - Amphibians are particularly vulnerable to artificial lighting which can deter mating behaviour and reduce calling. Avoid bright lights near water bodies that are known to contain native frog species;
 - Bright elevated artificial lights can have a considerable effect on nocturnally-active / migrating birds which can become 'entrapped' in these areas, thus depleting energy resources. Bright lights will be as low in height as possible;
 - Link existing native vegetation either side of underpasses by using mature-age habitat trees to start and end each underpass;
 - Hooded protective 500 mm cowl platforms to be placed at either end of underpasses to protect animals from aerial predators and rehabilitate any work zones around the base of support poles with at least 3 m radius of native shrub and tree vegetation.
 - Natural, dry substrate is preferred (not concrete) and should be used in fauna underpasses to encourage crossing through culverts by Koalas;
 - Appropriate fauna furniture will be placed within and leading up to fauna crossings. This furniture will be monitored by IR camera systems for fauna movement;
 - Culverts have a height slightly smaller than the width as these are more commonly used by fauna; and

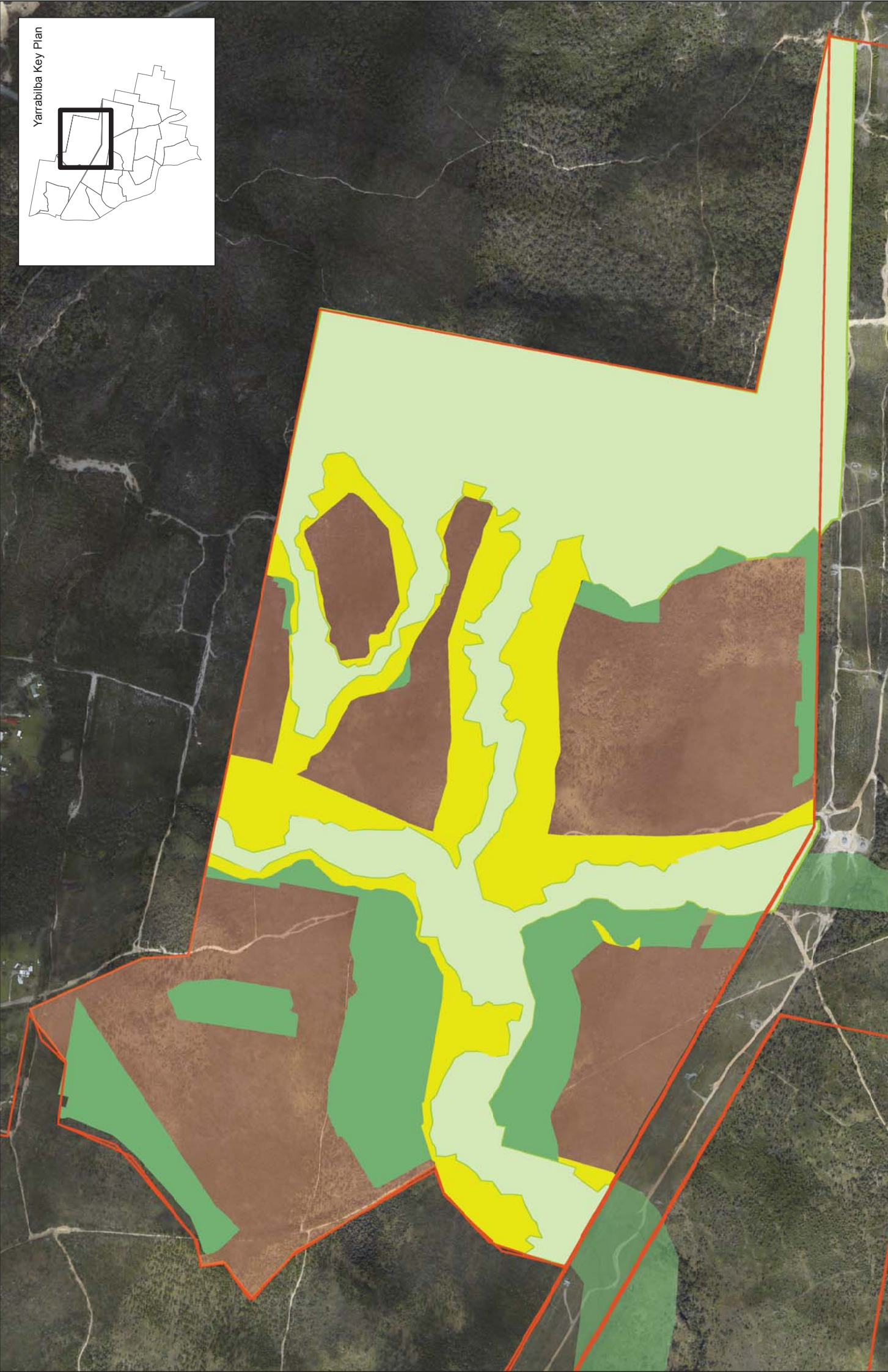
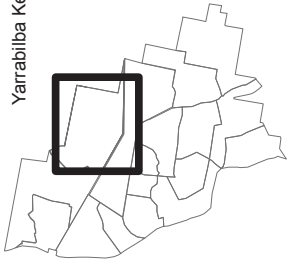
- Dual purpose culverts designed for both drainage and fauna passage have been known to have problems and, as a result, separate drainage and fauna movement structures have been provided.
- Koala Design: Koala sensitive urban design will be used to ensure that Koalas can move safely throughout the linear open space and fauna corridors; and
- Rehabilitation of degraded areas such as corridors, buffers, waterways, drainage lines and linkages is undertaken through assisted regeneration (weed control) and revegetation. These actions will enhance ecosystem functioning and ensure the continued health of the vegetation and fauna which rely on these areas for habitat.

I trust that the above meets with your satisfaction and if you have any queries please feel free to contact me at any time.

Yours Sincerely,

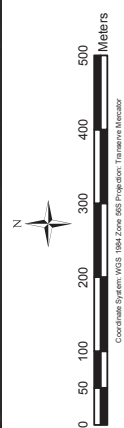


Kieran Richardt
Director
Natura Consulting



Precinct 3 Rehabilitation Concept Plan

- Developable Areas**
- Rehabilitation in accordance with landscape plan
 - Targeted rehabilitation planting areas
 - Weed control + supplementary planting



Source: Council of the Shire of Yarrabilba, 2015.
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FileDate: 15/05/2015

