# NORTH COORANBONG

## RESIDENTIAL ESTATE

## CONCEPT PLAN 2008

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# DOCUMENT HISTORY & STATUS

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Location of the North Cooranbong JPG Development

## 1.00 PRELIMINARY

### 1.10 BACKGROUND

The North Cooranbong project covers an area of some 364.76ha located within the Local Government Area of Lake Macquarie, approximately 100km north of Sydney.

It sits adjacent to the existing township of Cooranbong adjoined by state forest and rural residential properties. Part of the area includes the Avondale School.

The land was first identified by Council as an investigation area for urban conservation, employment and recreational purposes as part of Lake Macquarie Local Environmental Plan 2004.

In March 2005 a rezoning application was lodged with Lake Macquarie City Council by Johnson Property Group Pty Ltd who control the majority of the site.

In July 2005 Lake Macquarie City Council resolved to commence the rezoning process and, as required by the Environmental Planning and Assessment Act 1979, forward Council's resolutte to the Department of Planning seeking support to continue with the LEP amendment. The Department of Planning requested that a Local Environmental Study be undertaken and subsequent to this, URS prepared a Local Environmental Study of the site in December 2006. The LES was exhibited for 3 months during mid 2007.

On the 8th November 2007 the Minister formed the opinion that the proposal is a development to which Part 3A applies due to its sole significant importance.

Subject to this a concept plan has been prepared for the site detailing the considerations and outlining the studies undertaken to underpin design outcomes.

This concept plan examines the considerations and findings of those studies to develop a site responsive design. It should therefore be read together with the study document which examines the issues in more depth. The concept plan draws on these conclusions and responds to sites natural features.

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## 1.20 INTRODUCTION

HDB Town Planning and Design has prepared designs following a review of the previous studies and urban design work carried out on the site by Architectus, JW Planning Pty Ltd and URS, together with other specialised base studies; and from that, develop a site responsive concept plan based on new directions of Government.

The plan provides for some 2,500 lots within a total investigation area of 364.76ha.

The plan prepared outlines development objectives for the site and proposes a layout which underpins future zoning controls on the site. It interacts with the existing developments on the site and particularly the Avondale School and surrounding rural residential, to provide a permeable, liveable and environmentally responsive living environment. This is further examined in the following sections.


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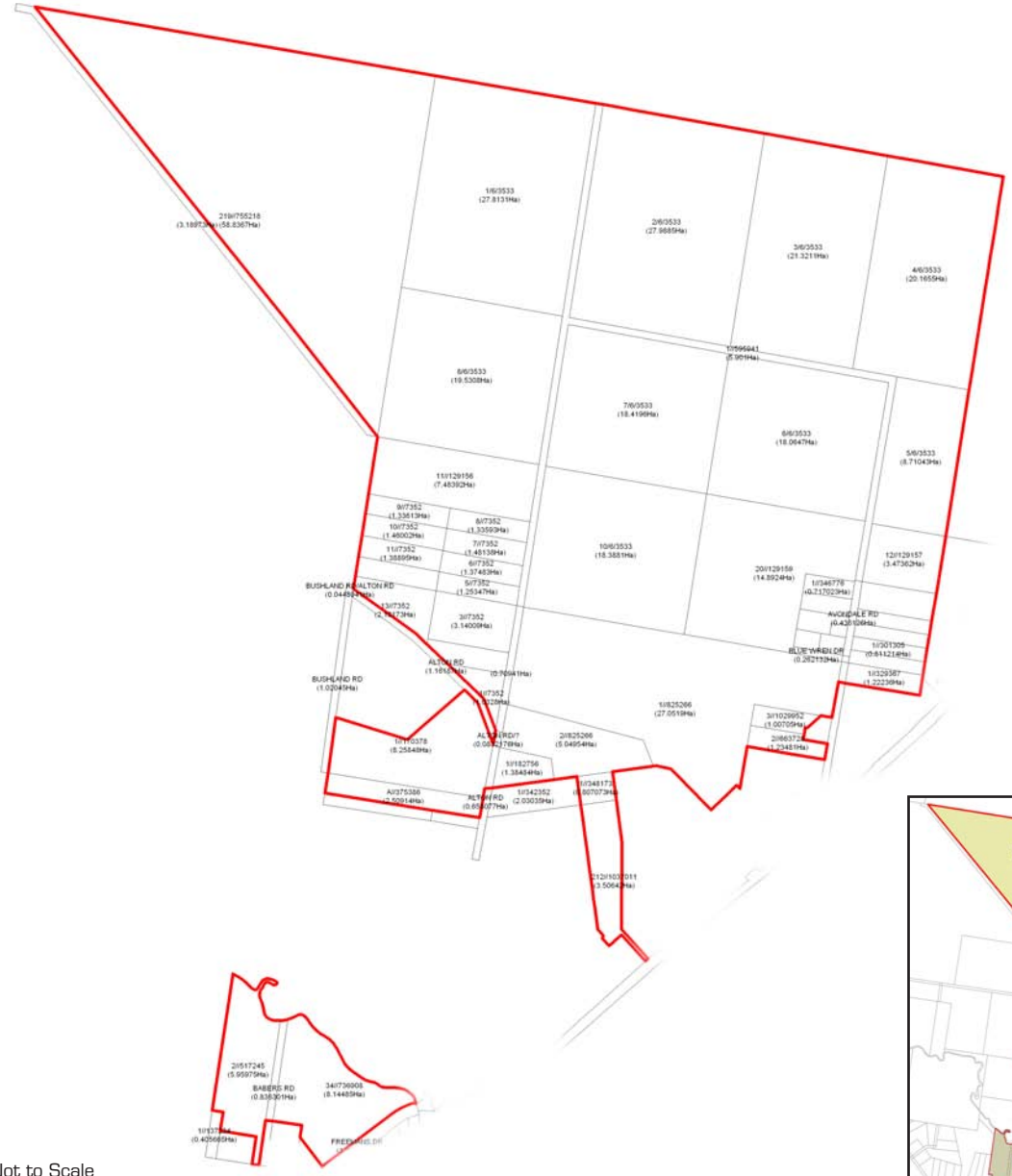


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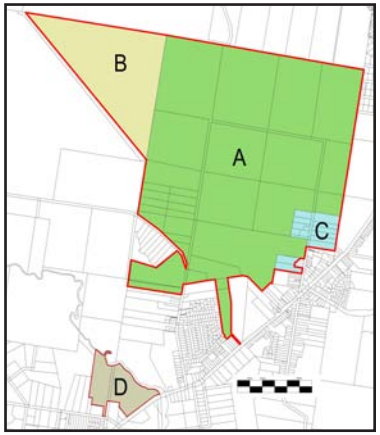


## 2.00 OWNERSHIP DETAILS

**Table 1 Lot Ownerships and legal description**

| Area | Lot | DP | Ownership/Proponent | Area |
|---|---|---|---|---|
| | 1 | 595941 | Australasian Conference Association Ltd (trustee for the Seventh-day Adventist Church)/Avondale Greens Developments P/L | 5.895 |
| A | | | | |
| A | 11 | 129156 | *As Above* | 8.12 |
| A | 12 | 129157 | *As Above* | 3.62 |
| A | 20 | 129159 | *As Above* | 15.3 |
| A | 1 - 13 | 7352 | *As Above* | 17.8 |
| A | 1 | 3533 | *As Above* | 28.42 |
| A | 2 | 3533 | *As Above* | 27.41 |
| A | 3 | 3533 | *Free Stone-Barks* | 20.53 |
| A | 4 | 3533 | *As Above* | 19.54 |
| A | 5 | 3533 | *As Above* | 8.576 |
| A | 6 | 3533 | *As Above* | 18.14 |
| A | 7 | 3533 | *As Above* | 18.34 |
| A | 8 | 3533 | *As Above* | 19.66 |
| A | 10 | 3533 | *As above* | 18.34 |
| A | 1 | 825266 | H. Pocock | 27.03 |
| A | 1 | 170378 | Avondale Greens Developments P/L | 10.77 |
| A | 2 | 825266 | Dabson | 5.056 |
| A | 1 | 182756 | I. & L. Mears/ Avondale Greens Developments P/L | 1.383 |
| A | 1 | 348173 | Avondale Greens Pty Ltd. | 0.807 |
| A | 212 | 1037011 | Avondale Greens Pty Ltd. (prev. 21//865588) | 3.508 |
| A | A | 375386 | | 2.50914 |
| **Adjoining Land** | | | Land subject to land owner's consent | |
| C | 1 | 329367 | S. & P. Dodson | 1.214 |
| C | 14 | 129157 | J. & I. Dabson and M. & A. Dabson | 0.809 |
| C | 1 | 301305 | P. & R. Hitchcock | 0.809 |
| C | B | 306673 | Hunt | 0.809 |
| C | A | 306673 | D. Sheedy | 0.809 |
| C | 13 | 129157 | I. & C. Iselin | 1.52 |
| C | 1 | 346776 | L. & D. Volkl | 0.722 |
| C | 2 | 346776 | G. Ferguson | 0.694 |
| C | 21 | 129159 | D. & M. Batey | 0.553 |
| C | 1 | 360725 | J. Vosper | 0.15 |
| C | 1 | 363639 | A. & D. Roy | 0.354 |
| C | 22 | 129159 | K. Dixon | 0.354 |
| C | 3 | 1029952 | I. & G. Wheatley | 1.021 |
| C | 2 | 663728 | A. Doncevic | 1.234 |
| B | 219 | 755218 | Avondale Greens Pty Ltd. | 58.38 |
| | **Sub-Total Area (ha)** | | | **350.18** |
| | + Inclusion of the Town Common / Park area | | | 14.58 |
| D | 2 | 517245 | Australasian Conference Association Ltd (trustee for the Seventh-day Adventist Church)/Avondale Greens Developments P/L | |
| D | 34 | 736908 | Australasian Conference Association Ltd (trustee for the Seventh-day Adventist Church)/Avondale Greens Developments P/L | |
| **Total Area (Ha)** | | | | **364.86** |

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# 04 SITE RELIEF

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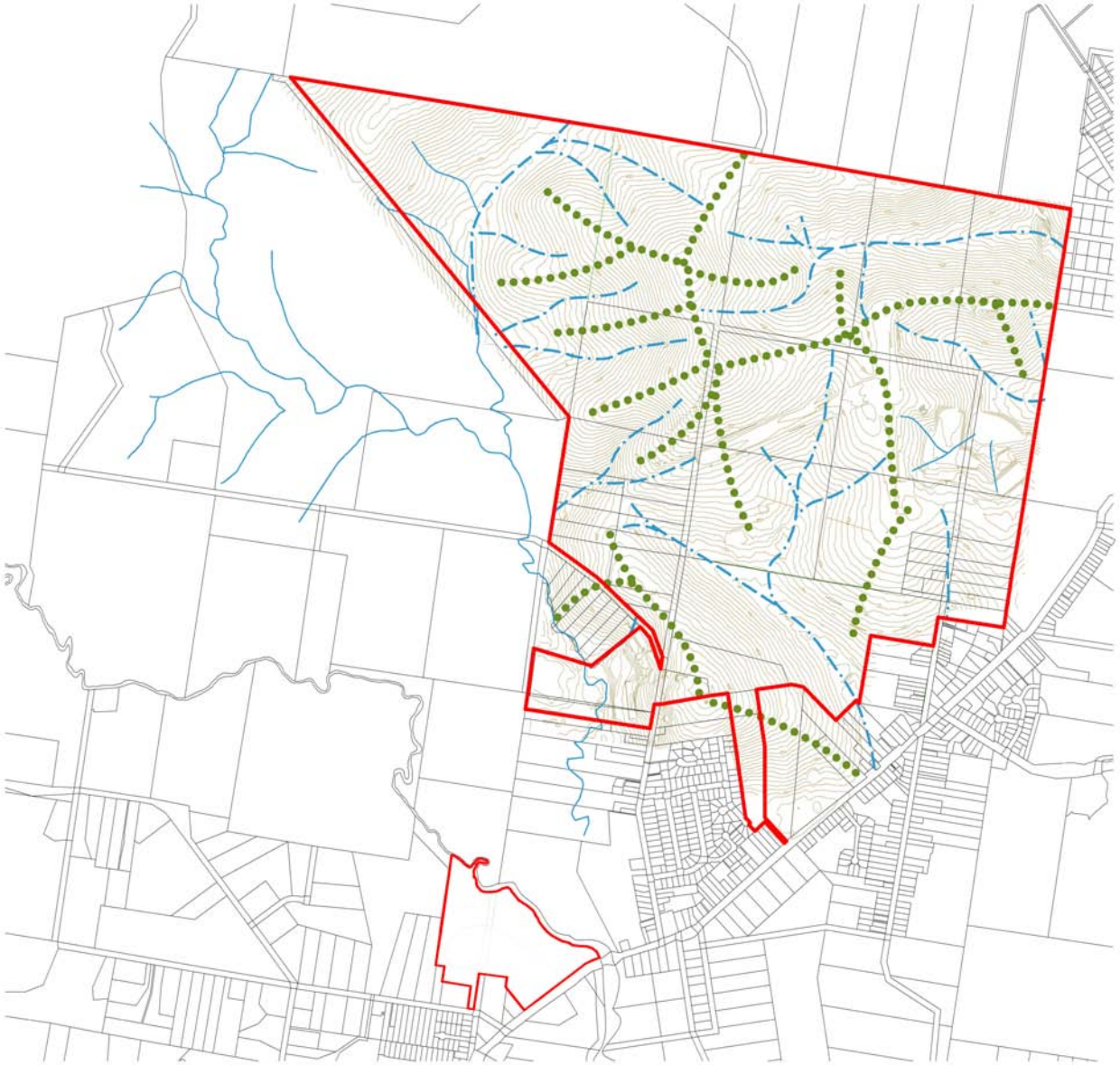

LEGEND

Development Boundary

Drainage Line (1:25,000 Topographic Map 9131-1N)

Ridgeline

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# SITE ANALYSIS AND CONSTRAINTS PLAN

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- SITE BOUNDARY
- SITE WOODLAND
- ADJOINING WOODLAND
- CONTAMINATION
- 1:100yr FLOODING
- EXISTING RESIDENTIAL LAND
- EXISTING RUNWAYS
- HIGH POINT
- RIDGELINES
- DRAINAGE LINES
- SLOPE
- VEGETATION CORRIDOR
- WINTER WINDS
- SUMMER WINDS

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# 3.00 URBAN DESIGN OBJECTIVES AND LANDUSE PRINCIPLES

## 3.1 VISION

The vision and development philosophy for the site is addressed by the five key objectives below. These objectives have been based on the Lake Macquarie Lifestyle 2020 planning strategy in order to direct future detailed design and development of the site.

### 1 Respond to the Environment

- Development should retain ecological corridors along main riparian corridors.
- Ecological corridors should link into the surrounding area.
- The pattern of development should respond to the natural topography.
- Contaminated land should be remediated if it is unsuitable for a proposed use before the land is developed.
- Development should encourage sustainable development principles.

### 2 Provide a diverse and well serviced community

- Development should create a legible, diverse community with a variety of house types.
- Development should provide a permeable road structure within the site which links the different residential areas and connects these areas with retained landscape, open space and community facilities.
- Development should balance residential land with appropriate provisions for local community and recreation facilities.
- Development should provide additional community facilities but avoid duplicating or weakening existing community facilities.

### 3 Provide a well designed, liveable neighbourhood

- Development should consider views from the surrounding area.
- The design of the neighbourhood should have a clear structure and a strong sense of place.
- Development should consider the urban form of the existing environment and build on the local character.
- Development should carefully consider features that could become local landmarks including high points, creek lines and where bridges cross the creeks.
- Stormwater detention should be located where it can become a positive feature of the landscape.
- Development should minimise risk from bushfires and flooding.

### 4 Encourage progress and prosperity

- Development should encourage home based businesses.

### 5 Create an integrated accessible development

- Development should define a compact and walkable neighbourhood with the majority of residents located within 5-10 minutes walking distance to a bus stop.
- Development should ensure that it can be approached from a variety of directions and is connected with existing roads, pedestrian routes and bicycles routes.
- Development should encourage walking/cycling to facilities within a reasonable distance including shops, schools and the Avondale College.
- Development should provide opportunities for future access connections through adjoining land.

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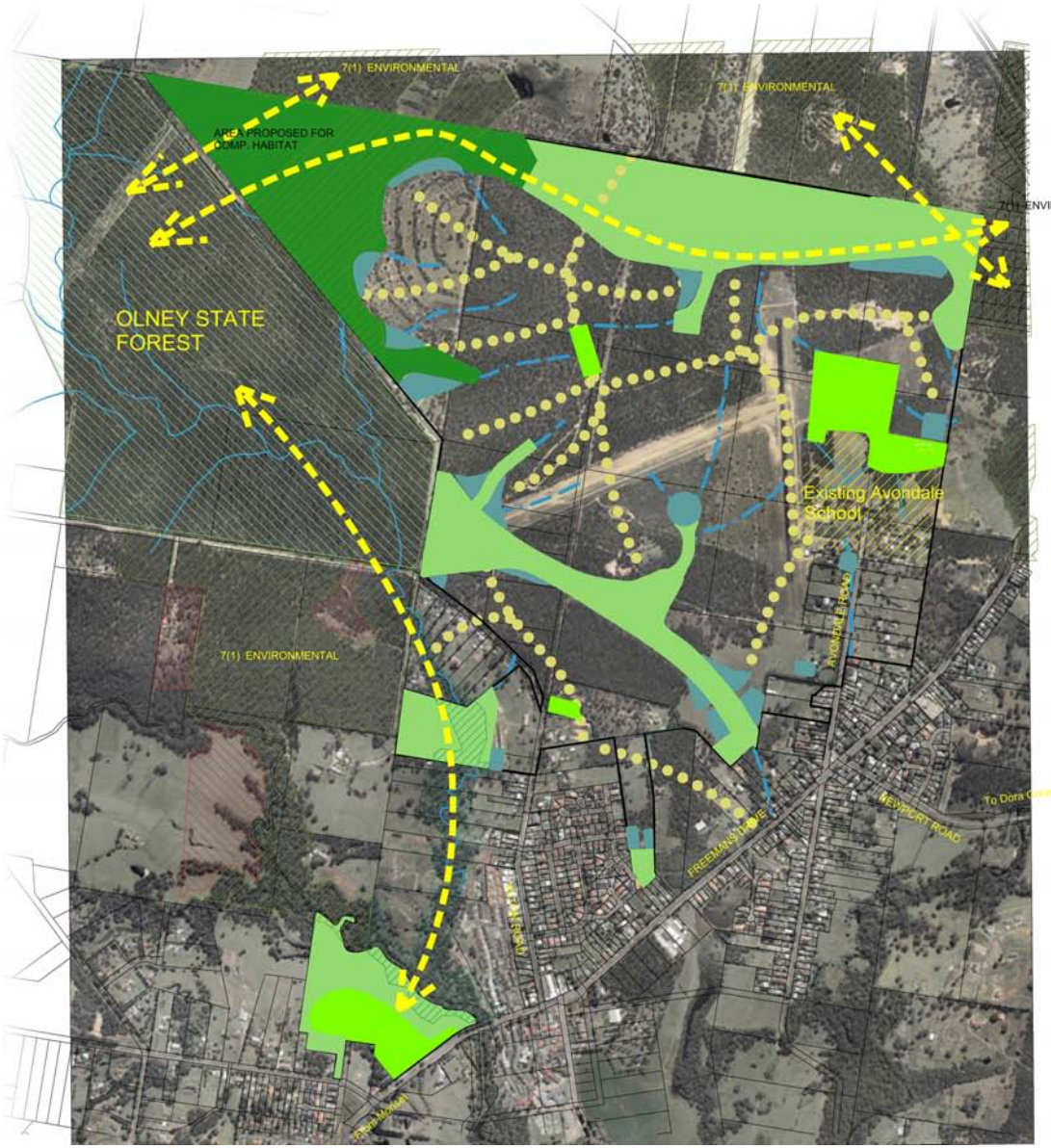


## 4.0 LAND USE

The urban design principles below have been base on the vision for the site and set out the goals and expectations for future development of the North Cooranbong site.

## 4.1 SUSTAINABILITY

- Ensure areas of retained woodland do not become isolated from the surrounding area and remain viable communities.
- Ecological corridors have been determined in discussions with fauna and flora consultants and DECC.
- Retain major creeks and their tributaries where shown.
- Water sensitive urban design principles are to be applied at detailed design stage for potable water demand and run-off water quality.
- Water quality measures could include a mix if bio detention swales and detention basins along roads and in areas of open space. These measures are to be located outside riparian and ecological corridors.
- Maximise the number of residential lots with a northerly aspect by designing roads to run east west where the topography allows for this alignment.

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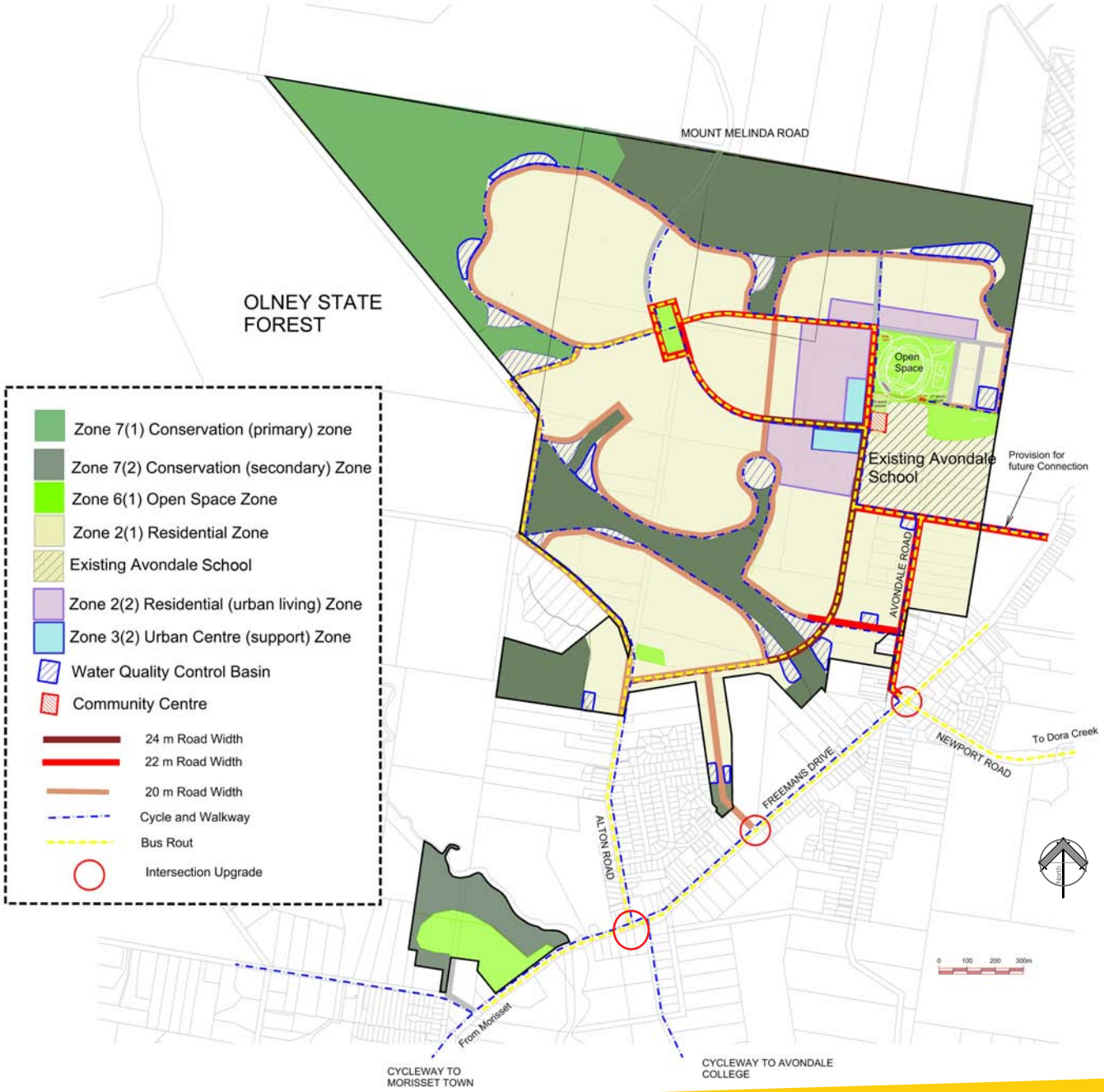


## 5.00 TRANSPORT

### 5.1 Access, Traffic, and Transport

- Integrate the proposed development with the Cooranbong area by providing high quality transport links to the existing road network and community facilities.
- Provide through site connections that improve the permeability of the wider Cooranbong area.
- Provide a minimum of three principle entries into the site. These access points will provide a route to the following areas of the site:
  - To the east of the site from Avondale Road
  - To the north of the site from Mt Nelinda Road
  - To the south west of the site from both sides of Alton Road
- Provide a link to the south of the site from the intersection of Avondale Road with Newport Road. If this link can not be provided directly across land outside the site boundary then provide a link through the site from Avondale Road. This link should be located as close as possible to the Newport Road and Avondale Road intersection.
- Allow for a link to the south of the site off Freemans Drive.
- Only designated roads in the structure plan may cross bushland.
- Identify existing bus routes which could be altered to travel through the site. The planning of land use and bus routes should provide catchments that are within a 400m walking distance of a bus stop.
- Roads to front areas of open space and retain landscape with roads where possible. This will maximise views of the bushland, allow good access for fire protection, ensure that the open space and retained landscape is overlooked and reinforce the established character for new development.
- Provide a network of connections for both vehicular and pedestrian movement within the internal street layout. The layout creates a clear hierarchy of streets where collector streets are designed to appear of higher status than secondary streets.
- Roads are to generally follow land contours to provide comfortable walking and cycling connections between houses and open space and bushland.

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## 6.0 BUILT FORM

- Provide a variety of residential types in the neighbourhood to foster a diverse community, provide for wide marketability and respond to local character.
- Locate low density development on constrained sites and increase density of development where it can take the best advantage of local facilities, public transport and open space.

**Conventional housing**

These areas would have an approximate density of 10dw/ha. Large areas of the site will be conventional housing densities within precinct themes developed during the design stages. Precincts may be defined by building articulation, landscape, and/or streetscape. Lots should be designed to maximise solar access and energy efficiency.

**Medium Density**

Areas of land facing open space, along collector roads and in close proximity to schools and community facilities will be available for well designed dual occupancy and small lot housing.

## 6.1 SITE CHARACTER

- Encourage the visual integration of new development with existing development in Cooranbong by locating development around street entry locations where possible.
- Locate collector roads where possible to run beside or across areas of retained woodland, riparian corridors and open space to encourage local awareness of these areas

and to visually integrate the bushland with the neighbourhoods.
- Reinforce the significance of the retained woodland, riparian corridors and open space by fronting development onto these areas.
- Design landscape features including drainage swales, open space, and street design to reflect the woodland character

## 6.2 VIEWS

- Views from surrounding area into the site are restricted as land generally rises away from existing perimeter roads, with limited views into the site. Where views into the site occur along Alton Road due to the land falling away from the road, provide lower density development adjoining the road to retain a woodland character and to integrate with adjoining development.
- Align roads to capture views of the surrounding escarpment. Retain the north south runway alignment for a collector road as it terminates in a view of Mount Nelinda. East west roads on the western edge of the site will have views that terminate in the escarpment.
- Terminate roads in views of open space and bushland where possible. This will aid legibility by allowing visitors to orient themselves in the wider landscape and maximise the value of bushland views.

## 6.3 EMPLOYMENT

- Development should encourage home business. Encourage

the design of dwellings that can accommodate home offices and home studios.
- Access to employment via road links and proximity to Dora Creek and Morisset rail stations.

## 6.4 SERVICES AND FACILITIES

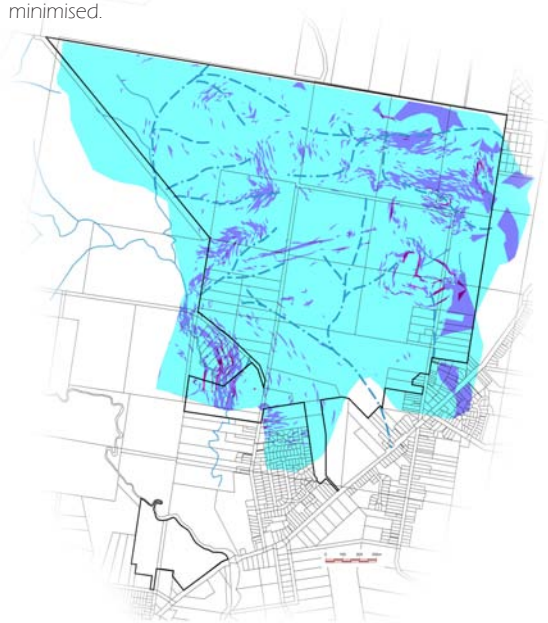
- The existing settlement of Cooranbong is well serviced by schools, local facilities and employment opportunities. The proposed development will reinforce the expansion of the existing Town Centre, local facilities, bus services and schools.
- Provide community facilities and improve the general amenities of the area and home studios.
- Encourage alternative transport links to Morisset and Dora Creek train stations.

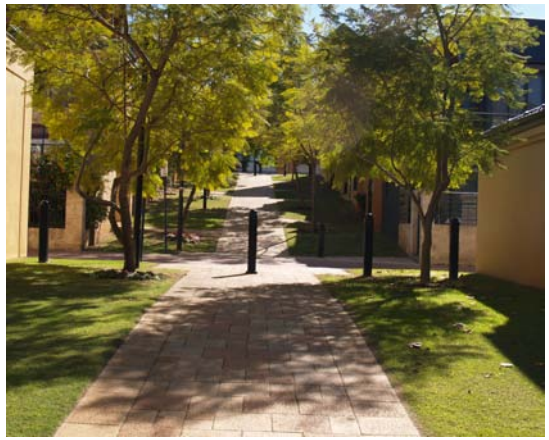
## 7.0 LANDSCAPE

- Provide ecological corridors of retained landscape which create a bushland setting for the development.
- The ecological corridors are to provide an appropriate environment for the protection of threatened species through habitat retention.
- Ecological corridors are to incorporate the main riparian corridors within the site.
- Whilst access through the ecological corridors and across riparian corridors will be restricted, provide for a range of passive recreation by the provision of bicycle paths and walkways next to the ecological corridors and riparian corridors.
- Prepare landscape plan showing a footpath system through open space and retain landscape to local facilities.
- Reinforce road hierarchy with landscaping to define main street.
- Provide quality landscape features in public open space areas to reinforce passive and active uses.
- Interconnect open space networks with environmental land.

## 7.1 TOPOGRAPHY

- While the site has no areas of steep slope (>25 degrees) which are unsuitable for development, where there is steeper land, locate dwelling forms that can be sensitively designed to respect the landform.
- Roads are to follow contours to provide for easy walking and cycling to community facilities, open space or bushland where possible. Roads perpendicular to contours should be minimised.





### Pathways

Pathways provide non-vehicular access throughout the development and are considered in two categories; Shared Pathways and General or Other Pathways.

General pathways are normally associated with local roadway reserves and provide pedestrian only access throughout the site.

Shared pathways should be located withing prominent open space areas, along view corridors, recreational areas, transport corridors (other than local roads), and for connection to transport systems external to the site.

### Shared pathways

Shared pathway/s provide an opportunity for cyclists and pedestrians to utilise community landscape assets whilst providing outdoor recreational activities and social interaction. Access nodes to the shared pathway system are throughout the subdivision providing an environmentally friendly internal transport network for residents. The landscaped setting will encourage exercise and reduce the use of motor vehicles.

The shared pathway is 3.0 metres wide and should be constructed from reinforced concrete. During the design development phase the design will consider and where appropriate, be in accordance with the principles of Council's Engineering Guidelines in Council's DCP 1, Ausroads, AS1428.1, AS1428.4 and CPTED principles.

### General pathways

All pathways (excluding the shared pathway described above) are 1.5 metres width

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reinforced concrete, with node points where appropriate. Pathway surfacing is proposed to provide distinction between areas, traffic, and usage. The pathways form an integral component of the landscape providing linkages between residential and open space areas, an opportunity for residents to appreciate the environment whilst involved in outdoor activities. Pathways include provision for disability access.

### Car Parking

Off-street car parking for vehicles is provided within the park. The parking area is to permit park users to park their vehicles in an area set aside for this purpose whilst permitting good access to all areas and activities within the park. The carpark shall be subject to design during the design development phase and shall be in accordance with the relevant Australian Standards.

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## 7.0 LANDSCAPE (continued)

### Park Vegetation

#### Landscape Plantings

The prominence of the surrounding natural environment and its beauty dictate the overall landscape theme of the site. Whilst roadways will provide structured plantings of street trees, park areas are designed to be less formal, an intermediary between the built and natural environments.

Native plant species will dominate the landscape however in certain areas northern hemisphere deciduous trees will provide shade in summer but permit sun to the park where users will benefit from the winter solar access.

Tree plantings provide shade for residents and visitors to the playground, picnic areas, skate park, car park, and dog exercise area. Trees planted in groupings provide a forest-like feel to the parks. Plantings of trees in turf areas is minimised to reduce interference with ongoing park maintenance operations.

#### Existing vegetation

Existing vegetation is retained in areas where earthworks are to be minimal. Where earthworks involve extensive disturbance under tree canopies the long term viability of those specimens affected is unlikely to be good.

However, the surrounding forest environment of the development site is one of the factors likely to make this sub-division attractive to potential residents. Therefore

retention of trees is preferred where possible to ensure that the existing skyline is maintained, at least in part. Retention of trees also increases long term potential for future habitat for native fauna. Although the development will include extensive tree landscape plantings it will be a significant number of years before any of those plantings can provide habitat. In the short term they will provide food sources for native fauna.

During the design development phase existing trees will be assessed with regard to drop hazard before siting play equipment and park furniture. Known problematic tree species will be avoided in trafficable areas of the park.

### Furniture

#### Seating/Picnic tables

Bench seating is provided at key points throughout the park to cater for users of the shared pathway, playground, sports playing fields, and general picnic areas. Additionally, picnic table settings provide for group use for picnics or general outdoor meeting/resting points. Some setting shall be provided with shelters to ensure that park users have shade from sun.

#### Taps and Bubblers

Taps and bubblers are to be co-located to minimise cost and are located adjacent to accessible paved areas and nearby seating areas.

#### Bike Racks

Bicycle racks are provided to service visitors to the main activity areas of the park.

### Playground area

Location of playground equipment has and

should consider access for residents in the area and should provide for good passive surveillance opportunities.

Play areas, particularly equipment should be at least 20 metres from environmentally sensitive areas and/or items, and exclude drip zones of existing trees.

#### Equipment

Play equipment shall be sourced, designed and installed to cater for the key needs and abilities of children in the 4-12 years age group and meet current Australian Standards.

Combined with extensive landscaping, the equipment will provide a high play value with a range of activities that encourage children's physical, social, emotional and cognitive development.

Equipment shall maintain the required distance to any ancillary items in the play area/s in accordance with the relevant Australian Standard.

#### Softfall

Softfall and its depths for the selected playground equipment are to be designed in accordance with AS/4422. Rubberised softfall will be provided to identified wear points beneath play equipment or in other areas as determined by the designer.
Edging to softfall areas shall be of a variety of materials including concrete, rock, contoured land forms, and/or timber.

#### Playground Fencing

Fencing is included to provide protection for play areas as determined by a design risk assessment during the design development phase.

## 7.0 LANDSCAPE (continued)

### Dog Exercise Area

The dog exercise area provides one hectare of the park to allow dog owners to be involved in leash exercising of their dogs. Landscaping of the area minimises the interaction between dogs and other park users such as children and cyclists.

### Toilet

Further design development is required however the provision of unisex disable accessible toilet/s to the park shall provide users with essential facilities and where possible the toilets are to be incorporated into general park community buildings.

### Garbage bins

Garbage bins are provided throughout the park to provide park users with facilities to dispose of rubbish in a manner that will not be detrimental to the environment.

### Vehicle control

To ensure the safety of park users from vehicles bollards, fencing and landscape elements prevent unauthorised vehicle access to the park. Maintenance access points will be provided where required.

### Skate Park

A Skate Park shall be incorporated into the park Masterplan. Design of the Skate Park shall occur during the design development phase with either input from, or designed and constructed by a specialist contractor with a reputation for well designed facilities.

### Sports Playing Fields

The area for the playing fields accommodates two full sized senior fields and a lower grade cricket field locating the pitch between the two fields.
During the design development phase the playing fields will be designed to provide a high quality playing surface that is playable within 24 hours of heavy rain and able to withstand high levels of use.

Further design development of the fields will include the growing media and drainage system both of which must be suitable for the local

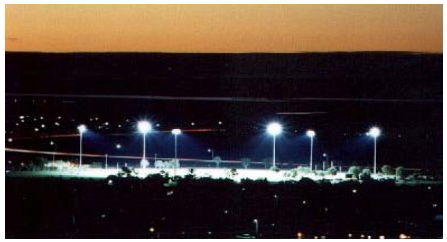
climate and rainfall patterns. Field grades will be determined through the design process but are expected to be between 1:70 and 1:100. The turf playing surface is to be an improved cultivar of couch grass (Cynodon dactylon) to suit the field design, the location, and proposed use.

A standard length reinforced concrete cricket pitch with painted finish/synthetic surface is provided located between the proposed playing fields. A concrete triple practice wicket area with 3.0m high black PVC coated chain wire mesh fencing on

three sides (and a portion of the roof) is provided near the playing fields.

### Flood lighting

One playing field will have floodlighting for night use. Flood lighting will provide 100 lux minimum in accordance with AS2560 and AS4248 Control of Obtrusive Light. The lighting design will be prepared by a suitably qualified lighting consultant to AS2560 Parts 1 and 2.3



### Irrigation and Water Quality

Sports playing fields to feature an automated pop-up sprinkler irrigation system landscape areas using recycled stormwater (with no potable mains water backup). Sub-surface storage areas are suggested pending a cost analysis at the construction phase although retention ponds within the park would be suitable.

Stormwater harvesting may be sourced from surrounding retention ponds located in the park or from detention basins in the adjacent subdivision. The irrigation system should include all components required to ensure a fully functional system including pump/s, sub-surface piping, sprinkler heads.

Ideally the playing fields would have little need for connection to the surrounding proposed mains system and would be self-sufficient in all but the severest of droughts. Once the final design layout is determined computer modelling would identify the requirements of the field/s.

The irrigation design is intended to be integrated with the playing surface design, proposed growing media and the design of the subsoil drainage system.

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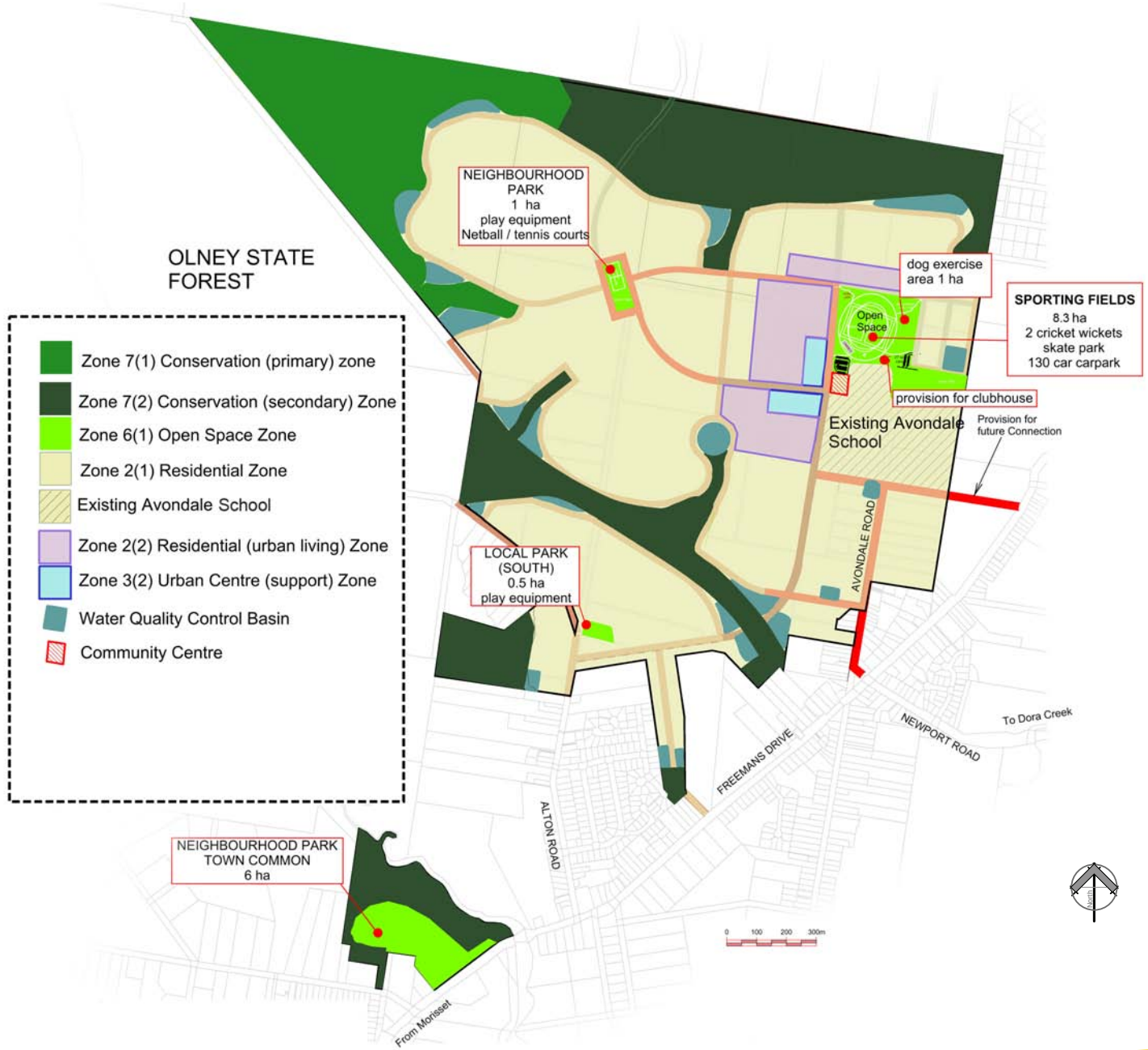


## 8.00 OPEN SPACE

- Generally locate principle areas of open space on flood prone land or on land at prominent locations. Open space areas are to be landscaped to allow active and passive recreation, including childrens play areas and sports fields. These areas may also need to provide a drainage function.
- Provide centralised sporting fields adjacent to school and community facilities incorporating a dog exercise area and neighbourhood park with play equipment, Community Centre, and adjoining mixed use open space.
- Provide centralised carparking to service open space areas.
- Provide 1Ha open space on top of hill between 2 high points to set reference point for the area and maintain tree canopy skyline.
- Locate water quality detention/retention Ponds adjacent to Enviromental Land to increase usable open space.

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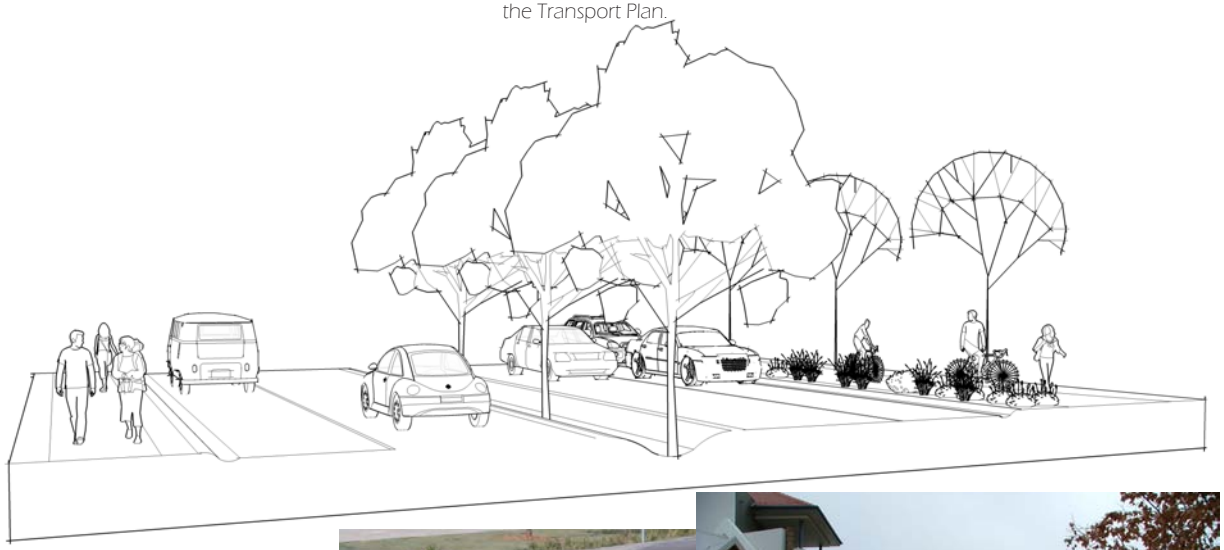
**Street Furniture**
Streetscape furniture ranging from street lighting, tree guards, seating, and garbage receptacles will be determined at the design development phase. However the style of the furniture will reflect the overall theme of the development and park furniture.

**Street Parking**
Provision for vehicle parking is determined by the location and type of roadway within the development site. In higher density areas, parallel parking will be the dominant form of street parking in bays separated by extensive street tree plantings.
Public transport will be catered for with the inclusion of parking bays similar to but of greater dimensions than the car parking bays. Bus bays will be located at key points along the designated transport routes shown on the Transport Plan.

## STREETSCAPE

**Streetscape**
The roadway is organised into a hierarchy dependant upon the type and function of the road. Dominant roadways are 24 metres in width with streetscape tree plantings located in central median bioswales.
Significant roadways indicated on the Concept Plan provide for avenues of stately trees that will give rise to shading canopies. The street tree plantings will be landscape features within the site and provide visual landmarks throughout the site.

Roadways will provide for pedestrian pathways 1.5m width in a variety of pavement surfaces depending on their location and purpose. Selected roadways will provide shared pathway/cycleways in the road reserve beneath secondary street tree plantings.



**Shared Pathway / Cycleway**
Through the provision of quality pavements and the scenic qualities of the North Cooranbong locality the proposed network of roads and shared pathways will encourage residents to participate in outdoor activities. Combined with road access the pathways will provide connectivity between residential areas, access to shops, and movement in park land and greenway areas.
At several feature points pathways will transmute to boardwalks alongside landscaped stormwater retention ponds. The nature of the boardwalk and its location will encourage leisurely pedestrian and cyclist movement by users.

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# 9.0 WATER QUALITY & MANAGEMENT

The North Cooranbong development site contains multiple natural drainage lines that contribute to several water catchments crossing the site's boundaries.

Water resourcing is a topical issue in Australia which is enduring one of the most lengthy and severe droughts experienced since European settlement. The importance of managing water during the development phase and beyond is recognised by Johnson Property Group.

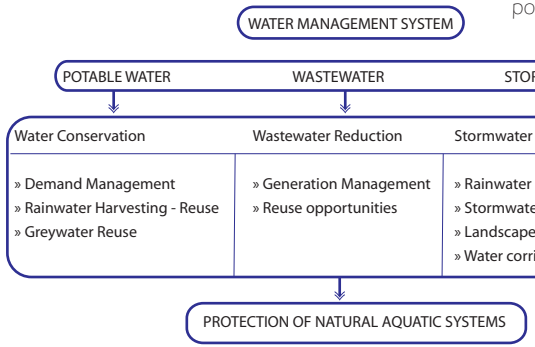
The sub-division design will mitigate where possible any potential for contamination of the natural water resources within the site and downstream through the implemention of a variety of measures.

Studies of the site have been undertaken to identify potential problems and have provided recommendations to enable Water Sensitive Urban Design (WSUD) principles to be implemented throughout the development.

Implementation of WSUD principles assist the development's compliance with the principles of the NSW State Groundwater Policy Framework Document. Taking a three pronged approach to water quality and management on the site will dramatically decrease any potential for contamination of surface or ground water systems.

The Water Management System will focus on and implement the following three components:

» Conserve potable water supplies through controls to decrease demands below current typical usages including rainwater harvesting and greywater reuse.
» Wastewater will aim to achieve reductions in wastewater generation and explore opportunities for reuse via a recycled supply network.
» Stormwater flow quality will be filtered and harvested at individual dwellings, community facilities, and open space and recreation areas. Gross Pollutant Traps (GPTs) will assist with water quality control at identified tibutaries to natural drainage lines. Landscape works will provide additional infiltration systems for surface and ground water flows supported by bioswales and retention ponds.




The report by Patterson Britton & Partners 'North Cooranbong Water Management' (Appendix J), outlines the development's adopted objectives concerning water management.

The report identifies four distinct objectives for the site:
1 Minimise Potable Water Demand
2 Minimise Impacts on Water Quality
3 Minimise Impacts on Water Quantity
4 Retain (and where necessary rehabilitate) Riparian Corridors.

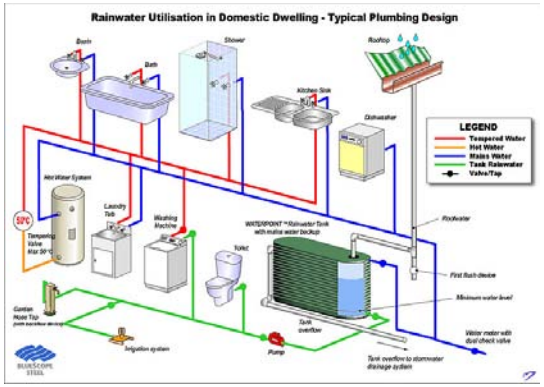
To achieve these objectives it is important that the development takes a catchment wide focus.

A number of control measures are proposed for the development that form the water quality and management for ongoing evolution of the site post-development.

The proposed measures increase opportunities to recharge groundwater systems through detainment devices whilst minimising contamination through natural and constructed filtration controls.

A prime component of water management will be the rehabilitation and restoration of natural drainage lines that will improve their unique ecosystem support role.

Surface water flows recharge groundwater systems and vice-versa. Water management systems will reduce the contamination potential of the natural systems whilst adding environmental value for both the built environment and increasing possible habitat for native fauna.




**Summary of Water Quality Control Management Implementation**

° Shallow-sided detention and retention basins providing storage and filtration whilst adding aesthetic value to the development landscape
° Vegetated corridors to be restored and maintained where necessary
° Use of bioswales in the road network to provide opportunities for stormwater treatment and infiltration creating Waterway Corridors.
° Maintain existing natural drainage lines outside of earthworks.
° Installation of GPT's on tributary drainage lines
° Provision of variable width road reserve and pathway alignment permitting landscaping to add infiltration opportunities.
° Stormwater retardment basins in roadsides where possible.
° Co-location of services in road reserves to increase landscaping opportunities.
° Playing fields irrigated by on-site rainwater harvesting.
°Monitoring and Risk Assessment / Control to be developed and included in a Construction Management Plan
° Recycled water

OBJECTIVES OF WATER SENSITIVE URBAN DESIGN (WSUD)
1 Protection of Natural Systems
2 Integration of stormwater treatment into the landscape systems
3 Protection of water quality
4 Reduction of runoff and peak water flows
5 Addition of value whilst minimising development costs.

"To manage the State's groundwater resources so that they can sustain environmental, social and economic uses for the people of NSW"
(The NSW State Groundwater Policy Framework Document, Policy Summary)

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## 10.0 SCHOOL

Avondale School have determined that their current and planned future needs can be met by a site of 14.44ha. This area has been identified however it has not been subdivided from the larger site.

The proposed Structure Plan will have the following benefits to the school:

### Character

The school currently is in a rural/bush setting with undeveloped land to the north, east and west of the site. To the south, along Avondale Road, is a more urban character although the large blocks of land create a suburban edge or semi rural quality.

The Structure Plan would change the character of the school to become more integrated with an urban/suburban environment. The Structure Plan locates developable land to the north west and west of the school. The visual impact of urban development would be reduced from within the school due to the slope of the land which focuses views to the north of the site.

The location of the sporting fields adjoining to the north, maintain an open view and provide a synergy with the school.

### Access

The school is located at the end of Avondale Road, a long cul-de-sac. There is only one access point into the school from this road. The one entry location creates a number of difficulties as all access to the school including buses and parent drop off/pick up area (staff carpark) occurs at this one location and all vehicles are required to turn within the site.

The Structure Plan provides additional access routes into the school site, which would allow greater flexibility and allow the development in the future of separate campuses with different access routes.

The network of roads within the structure plan will allow buses to drop off and pick up students in areas servicing both the school and sporting areas. This will avoid the need to provide bus turning within the school site and make land available within the school that is currently used for this purpose.


Not to Scale

- Youth & Community Facilities
- Urban Centre (Support)
- Open Space
- Residential
- Existing School
- Residential (Urban Living)

Bicycle routes to and through the site would also link to the school providing an alternate mode of transport for students and staff.

### Frontage

As noted above the school currently has no long boundary along a public road. This reduces visibility of the school in the wider community and limits flexibility for access into the school. The Structure Plan establishes a new frontage for the school along the southern and western boundary of the site.

Existing Avondale School building

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**Community facilities**

A number of community facilities have been recommended as part of the development of this site. The indicative development locates these facilities between the school and sporting fields centrally within the site. This would allow a synergy between the school and the community facilities and give the school direct and easy access to the facilities.

**Future growth**

School sites may need to incorporate incremental growth in the future. This can be difficult to achieve when a road crossing is required to achieve this growth. The alignment of the road to the west of the school follows the north south runway. This provides a developable area along the western boundary of the site where future incremental growth could occur.

## 10.1 SCHOOL (Public)

It is not proposed to provide land for a public school on the site. The Social Impact Assessment prepared by Key Insights identified that existing schools have capacity to increase their numbers and a growth in numbers for a small public school like Cooranbong Primary means the ability to attract more teachers and enhance local choices available to students. It is prudent to support the sustainability of local schools.

The trend in NSW at the moment and in the Morisset area, is towards private education. Students from this development will take up high school places at the local Avondale High, Hunter Grammar in East Maitland, St Paul's Catholic High School at Toronto and at a variety of independent schools in both Newcastle and Lake Macquarie LGAs. Some of course will attend Morisset High School which will feel the cumulative impact of development throughout the Morisset planning district. However it cannot be assumed that all high school students in North Cooranbong will attend Morisset High.

## 10.2 COMMUNITY FACILITIES

The community facilities proposed in the Structure Plan area:

- Provide land for construction of 2.42ha childcare centres (3,764m² in total)
- Construct a multipurpose centre which includes provision of a meeting space with a total area of 914m²
- Youth centre with an area of 136.5m²

## 10.3 OPEN SPACE

Retained landscape, open space and community facilities will provide for recreation and conservation needs.

Recreation facilities would possibly include:

- 1 x mixed use sports field
- 2 x cricket wickets
- 2 x tennis courts
- 2 x netball courts
- Skate park
- Day exercise area
- Playground

## 10.4 EMPLOYMENT LAND

The proposed residential development on the site is located in relatively close proximity to existing employment opportunities within Cooranbong, Morisset and the Morisset Industrial Estate which is located adjacent to the F3 freeway. The existing range of employment opportunities offered within Cooranbong include the existing retail centre, the primary and secondary schools, the Avondale College, employment related to aged care facilities in the area and the Sanitarium Health Foods factory. The proposal will have the effect of allowing people to locate in close proximity to these existing employment opportunities without the development adversley affecting existing businesses.

The proposal also provides opportunities for employment on the site in the form of non-centre based employment such as home based businesses and home based industries. The proposal is consistent with the Lake Macquarie Non-Centre Employment Strategy.

# LAND USE PLAN

# NORTH COORANBONG
RESIDENTIAL ESTATE
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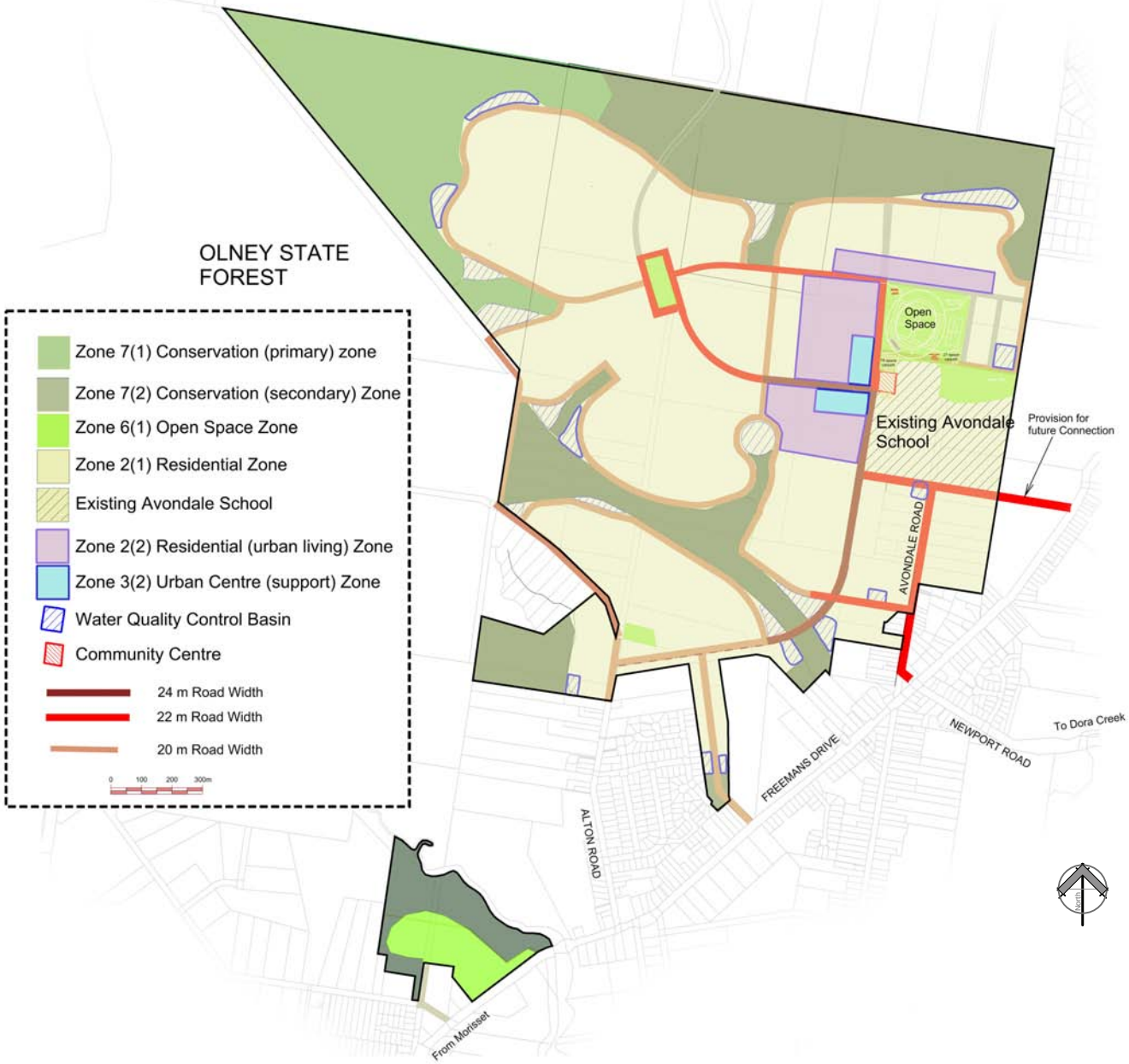
## 11.0 MIXED LAND USE




| Land Use | Ha | % (approx. of 364.76Ha) |
|---|---|---|
| Environmental Conservation Area | 106.35ha | 29.1% |
| Open Space | 10.8ha | 3.0% |
| Residential (Urban Living) | 18.83ha | 5.12% |
| Urban Centre (Support) | 2.15ha | 0.6% |
| Water Quality Control Basins | 10.4ha | 2.85% |
| School Site (existing) | 15.1ha | 4.2% |
| Community Facilities | 0.55ha | 0.10% |
| Residential | 186ha | 51% |
| **Sub Total** | **350.18ha** | |
| **Town Common** | | |
| Environmental Conservation | 8.68ha | 2.38% |
| Public Recreation | 6.0ha | 1.65% |
| **Sub Total** | **14.78ha** | 100% |
| Total: | 364.86Ha | |

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