



Coal & Allied Southern Lands

Appendix A: Concept Plan Principles for Gwandalan

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Appendix A: Concept Plan Principles for Gwandalan accompanies the Environmental Assessment. It embodies the ideas and principles that underpin the Concept Plan. The Concept Plan represents an integrated approach to site planning that incorporates landscape with the urban structure.

The structure of this document is as follows:

- **A1 Concept Plan** - this summarises the key elements of the design. The concept plan will describe the boundaries of the development footprint, street and block layout and future desired character of the landscape and built form.
- **A2 Design Principles** - this comprises of urban structure, built form, open space and landscaping, access and movement, heritage and visual impact design principles that support the Concept Plan.
- **A3 Staging** - this will describe the intended development staging for the estate.

Appendix B: Urban Design Guidelines for Gwandalan provides detail information on the public domain and built form. It describes how to achieve the principles of Appendix A: Concept Plan Principles for Gwandalan.

LIST OF FIGURES

Figure A1.1.1:	Gwandalan conservation and development area	4
Figure A1.2.1:	Illustrative concept plan	5
Figure A1.3.1:	Indicative lot layout	6
Figure A1.4.1:	Landscape character types	7
Figure A1.4.2:	Woodland landscape type	7
Figure A1.4.3:	Forest landscape type	7
Figure A1.4.4:	Maintain bush character with tree lined streets of native species	8
Figure A1.4.5:	Use of natural materials and simple construction for swales and bushland reserves	8
Figure A1.4.6:	Informal playing fields fringed by trees	8
Figure A1.4.7:	Village green for informal gathering/community events/ informal sports events	8
Figure A1.4.8:	Flexible park structure allows for occasional events	8
Figure A1.4.9:	Parkland paths provide connections along foreshore and within bushland reserves	8
Figure A1.5.1:	Character precincts	9
Figure A1.5.2:	Hilltop Precinct	10
Figure A1.5.3:	Houses with an architectural expression of horizontal proportions with a strong masonry base and lighter materials for upper storeys	10
Figure A1.5.4:	Architectural features in natural or painted timber	10
Figure A1.5.5 :	Low pitched roofs with wide eaves contribute to the horizontal proportions of the houses	10
Figure A1.5.6:	Cool creams and greys and beige tones reflect the existing vegetation	10
Figure A1.5.7:	Materials and finishes of exposed brick and timber are encouraged	10
Figure A1.5.8:	Illustrative streetscape character	10
Figure A1.5.9:	Lakefront precinct colour palette	11
Figure A1.5.10:	Red tone highlights architectural features.	11
Figure A1.5.11:	Exposed rafters and wide eaves	11
Figure A1.5.12:	Illustrative Streetscape Character	11
Figure A1.5.13:	Screens for verandahs and decks provide sun shading and privacy	11
Figure A1.5.14:	Materials and finishes include masonry and timber	11
Figure A1.5.15:	Massing and form of integrated housing is articulated.	11
Figure A2.1.1:	Urban structure	12
Figure A2.2.1:	Proposed hamlets	13
Figure A2.3.1:	Built form	14
Figure A2.4.1:	Open space and landscape	15
Figure A2.5.1:	Street hierarchy	16
Figure A2.5.2:	Pedestrian and cycle paths	16
Figure A2.5.3:	Stormwater treatment	16
Figure A2.5.4:	Lighting	16
Figure A2.6.1:	Minimal visual impact due to the retention of existing trees within the foreshore reserve	17
Figure A2.6.2:	Existing views of the site from across the bay	17
Figure A2.6.3:	Existing views of the site from Gwandalan Lions Park	17
Figure A2.6.4:	Typical west-east section	17
Figure A3.1.1:	Development staging	18

TABLE OF CONTENTS

Introduction		
A1 Concept plan and landscape concept plan		
A1.1	Development Footprint	4
A1.2	Concept Plan	5
A1.3	Indicative Lot Layout	6
A1.4	Desired Future Character: Landscape	7
A1.5	Desired Future Character: Built Form	9
A2 Design principles		
A2.1	Urban Structure	12
A2.2	Proposed Hamlets	13
A2.3	Built Form	14
A2.4	Public Domain Open Space	15
A2.5	Access and movement	16
A2.6	Visual Impact	17
A3 Development staging		
A3.1	Development Staging	18

A1.1 Development footprint

Coal & Allied's landholdings at Gwandalan include 268 hectares of land that is currently contiguous with Munmorah State Forest.

The development footprint is defined by the area shown blue on the plan opposite and has the following boundaries.

- Summerland Road, an unmade road to the north
- Extension to Munmorah State Forest to the south
- Kanangra Drive to the west, and
- An average of 100m setback from the Lake Macquarie foreshore to the east.

The development footprint is 62.24 hectares and has been determined following a planning process that is based on McHargian principles of site design. Detailed attributes of ecological and cultural landscape systems were overlaid to determine constraints and opportunities for development. The proposed development footprint is located to:

- Protect existing endangered ecological communities and ensure proposed conservation areas form large tracts that are easily managed and sustainable;
- Respect aboriginal archeology and heritage;
- Recognise riparian zones;
- Respond to Asset Protection Zones;
- Provide public access to the foreshore; and
- Consolidate development in one self-contained area contiguous with existing development in Gwandalan.

The development footprint is proposed to be setback an average of 100m from the foreshore to protect Aboriginal archaeology and endangered ecological communities that are found in the foreshore zone. This will ensure that the public foreshore is part of the conservation lands and that the network of bushland along the foreshore of Crangan Bay is maintained.

The remaining undeveloped Coal & Allied land is proposed for dedication to New South Wales Government as conservation areas. The proposed conservation areas will be connected with other conservation lands, forming large tracts that are easily managed and sustainable.

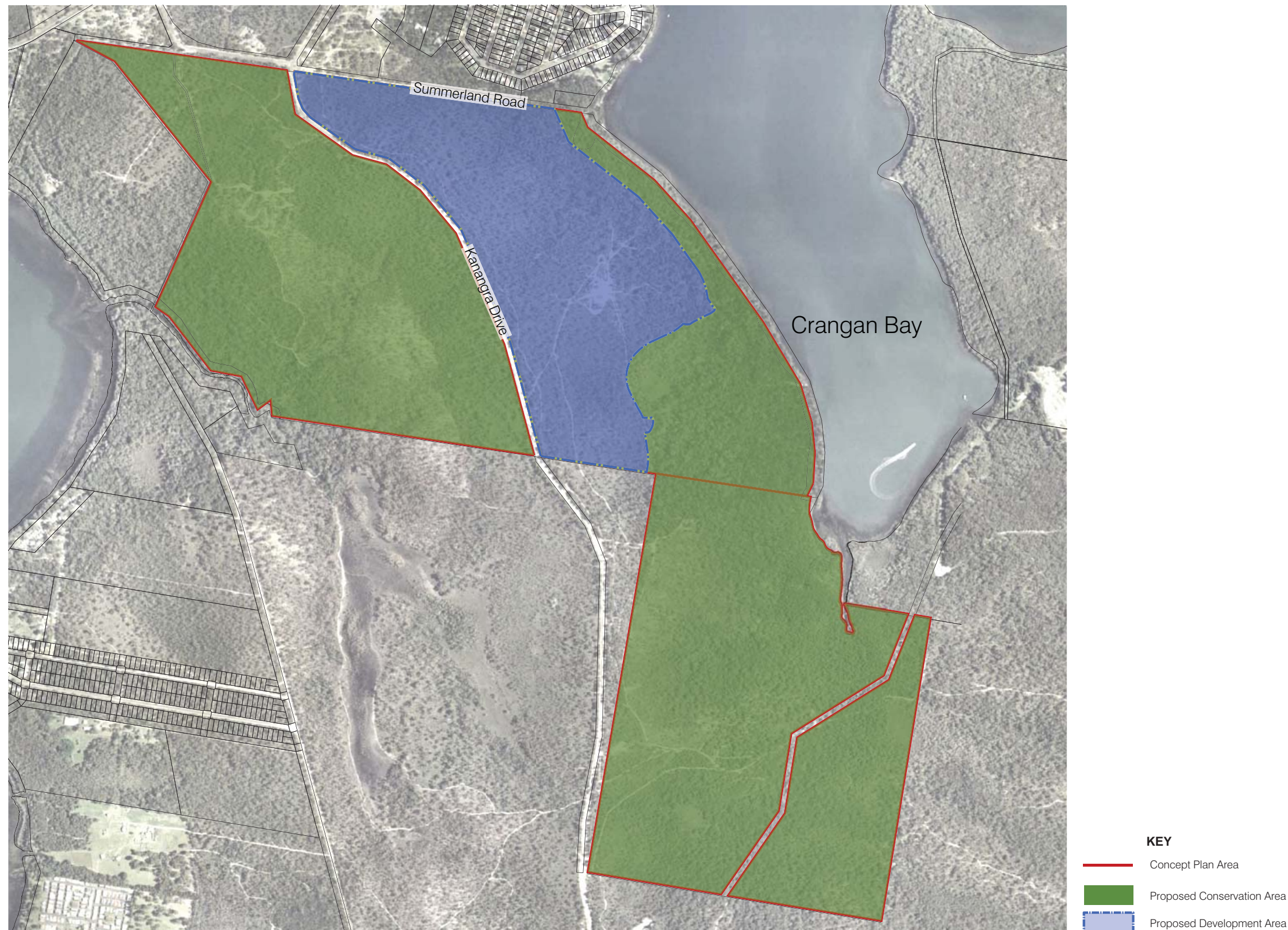


Figure A1.1.1 - Gwandalan conservation and development area

A1.2 Concept Plan



The Concept Plan is for:

- The equivalent of 586 dwellings in 62.24 hectares with an overall density of 9.4 dwellings per hectare.
- The 586 dwellings consist of 387 dwelling lots and 199 seniors living dwellings.
- A bushland reserve is located within the main drainage line of the estate, providing on site stormwater filtration within a bushland setting.
- Another drainage line, following the natural contours, is located mid-way through the north-western block.
- A landscape buffer along Kanangra Drive which maintains existing landscape character and screens the estate from Kanangra Drive.
- Three new parks located on the eastern edge of the site contiguous with the conservation lands and its recreational opportunities by the foreshore.

Two distinct hamlets will be created within the development footprint, separated by the bush reserves. Each hamlet forms a pocket of development surrounded by bushland. The development will have:

- Limited access from Kanangra Drive so as to minimise potential traffic congestion points on Kanangra Drive.
- A perimeter road that forms part of the Asset Protection Zone.
- A street grid hierarchy that is defined by a major north-south road and an east-west road cross axis.
- A street pattern that maximises the number of east-west streets connecting the public domain visually to the foreshore conservation area.

The proposal includes a public footway along the foreshore that will link the public domain of the proposed development to the existing settlement at Gwandalan subject to approval by the Office of Environment and Heritage NSW. A defined footway will protect the foreshore by confining public access to a manageable corridor.

A1.3 Indicative Lot Layout

The concept plan is indicatively designed for 586 dwellings which are proposed to be of the following:

- 387 dwellings contained in individual lots.
- 199 seniors living dwelling units.



Figure A1.3.1 - Indicative lot layout

A1.4 Desired Future Character: Landscape

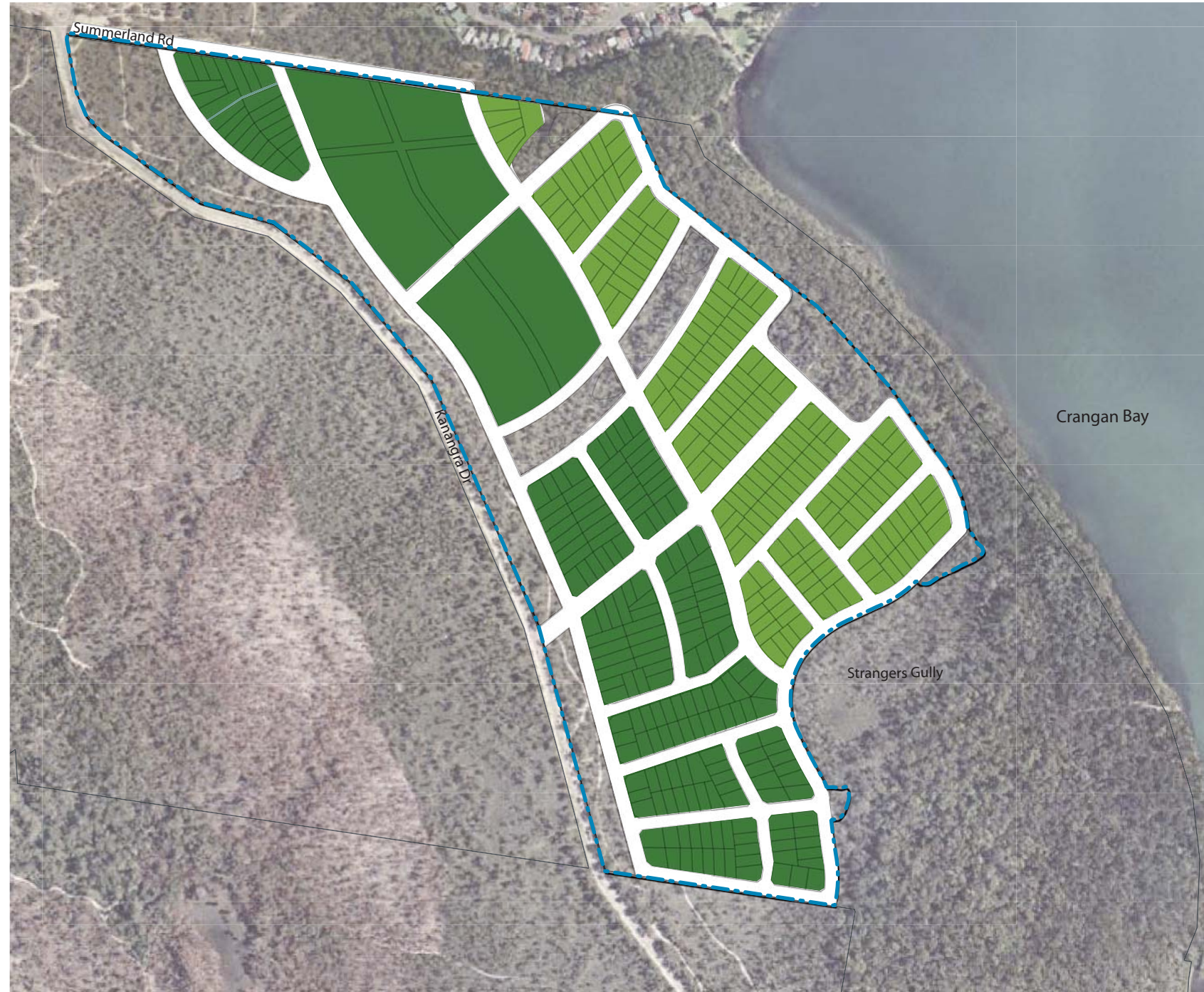


Figure A1.4.1 - Landscape character types

KEY

- Woodland Landscape
- Forest Landscape



Figure A1.4.2 - Woodland landscape type



Figure A1.4.3 - Forest landscape type

Existing landscape character

Two existing landscape types that occur on the site are:

- Woodland landscape type on the flat plateau of the western part of the site. This landscape type has a discontinuous canopy and a ground plane dominated by grasses, which together form a park-like landscape character.
- Forest landscape of taller trees and low shrubs that is endemic to the site's sloping lakefront edges. This landscape has a continuous canopy of trees that form an enclosed landscape which frames distant views.

Desired future landscape character

- The future landscape character will interpret the two landscape types that occur on the site by retaining and enhancing the existing vegetation. They will provide a setting that is dominated by the landscape of trees creating a sense of housing set in bush-like parkland.

Woodland landscape

- The western part of the Gwandalan Estate will retain its woodland character and will continue to link this landscape type with woodland to the south. Development will be characterised by long flat serpentine north-south streets that traverse the site. Streets will meander between the trees that will be scattered along the street verges and within private lots. The ground plane will be predominantly grassed. It will be an open landscape with scattered small native trees.

Forest landscape

- The eastern part of the site will be characterised by a forest landscape of taller trees with minimal understorey, forming a vegetation link with the forest at the lakefront edge of the site. The long streets in this area will be predominantly aligned to the water. They will be straighter and slightly inclined to take advantage of proximity of Crangan Bay and the opportunity for views to the water. The streets are narrower and built form will be tighter to frame water views. Street trees will form clear avenues of tall mature trees that help frame views.



Figure A1.4.4 - Maintain bush character with tree lined streets of native species



Figure A1.4.5 - Use of natural materials and simple construction for swales and bushland reserves



Figure A1.4.6 - Informal playing fields fringed by trees



Figure A1.4.7 - Village green for informal gathering/community events/informal sports events



Figure A1.4.8 - Flexible park structure allows for occasional events

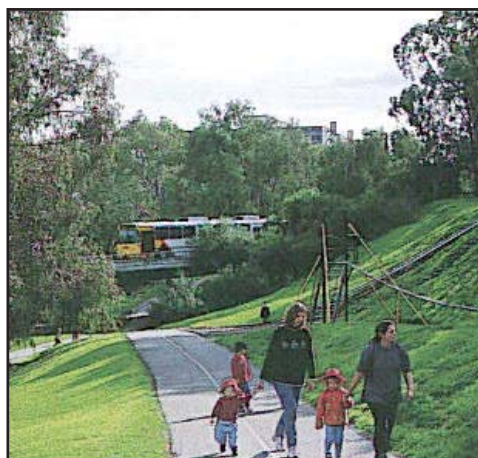


Figure A1.4.9 - Parkland paths provide connections along foreshore and within bushland reserves

Public domain

Parks

- Three new urban parks will be located on the eastern edge of the estate, providing a rich and diverse range of settings that will accommodate activities for the incoming community. The borrowed landscape of the conservation lands which include tall trees will form one edge of the parks. Internally, the parks will be dominated by a sequence of grassed areas formed by clearings within a framework of tall native mature trees. Parks will use natural topography to form usable terraces and endemic vegetation to define space. Built form will be minimal and will defer to the landscape setting.

Bushland reserve

- There will be an ecology-based reserve within the main drainage line in the estate that forms an undeveloped green corridor through the site. It will have a dense and diverse canopy with rich shrubs and ground covers. Road bridges and sympathetic footways will cross the reserve. The drainage line will be embellished with cascading swales and detention areas that enhance the quality and control the quantity of stormwater that flows into Lake Macquarie.

Streets

- Streets will form simple connections around the site. They will have a strong landscape presence generated by the layout and consistency of street trees. The landscape of the streets will be enhanced by ground plane planting, a consistent palette of paving material and minimal furniture. A variety of street typologies have been developed. They will have differing landscape treatments based on the desired future landscape character statements and based on the hierarchy of streets. Details of street landscapes are included in the Public Domain Plan.

Private domain

- The landscape of privately owned residences will be controlled so as to reinforce the setting of the desired future landscape character types. Paved areas will be minimised, giving preference to natural ground planes. Fences will be restricted to areas behind the front building line. Plant species will be dominated by endemic species. Trees will be retained wherever possible and supplemented by planting of same or similar species.

A1.5 Desired Future Character: Built Form

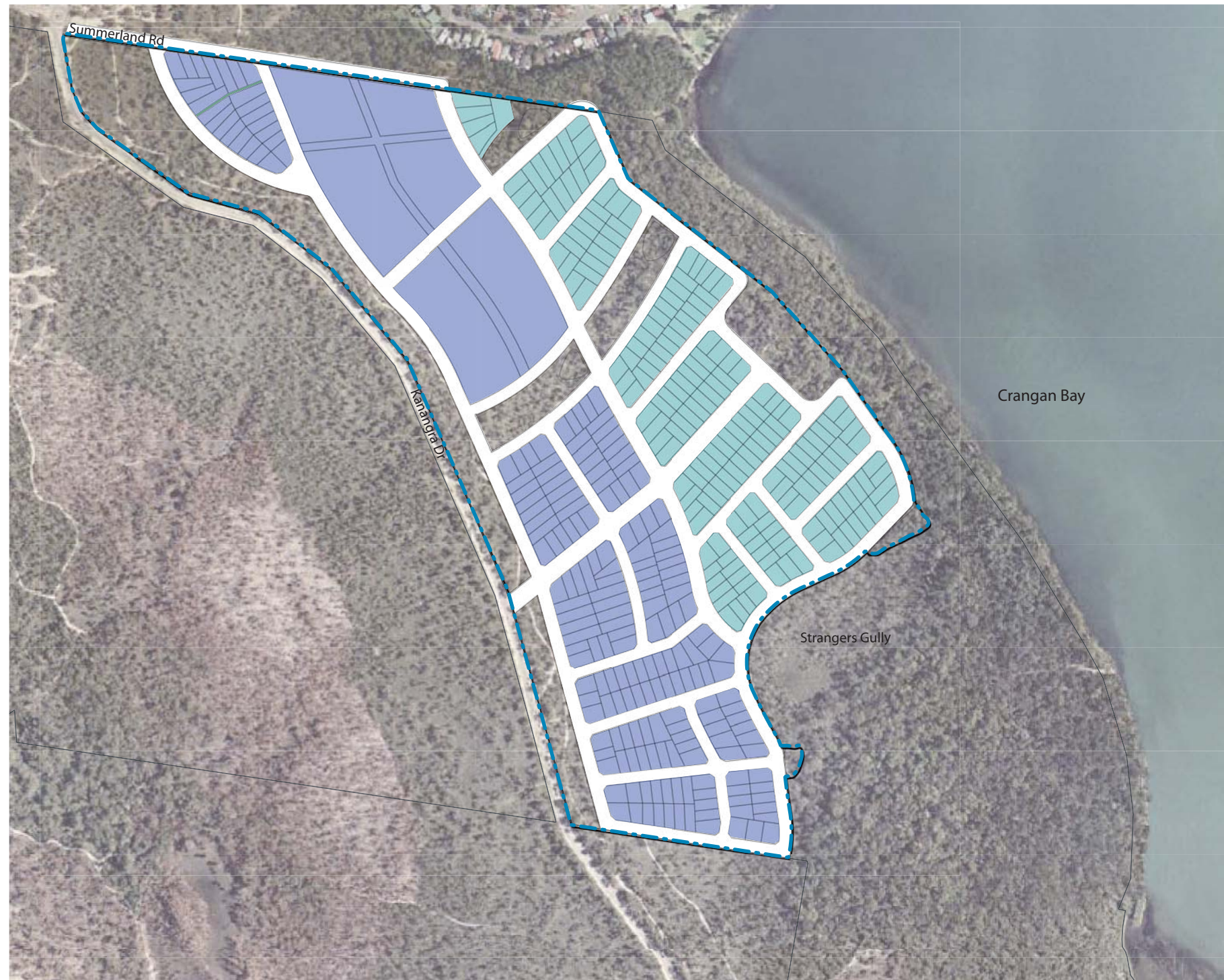


Figure A1.5.1 - Character precincts

- The Gwandalan Estate has two character precincts based on the existing landscape character of the site. The precincts are:
 - Hilltop Precinct
 - Lakefront Precinct
- The housing types enhance the landscape setting of each precinct by reinforcing its individual landscape setting and encouraging the retention of existing trees where possible.
- In general, houses in the Gwandalan Estate are characterised by horizontal proportions created through the use of low-pitched hipped roofs and wide eaves. A strong masonry base with lightweight materials used for the upper storey incorporating architectural features such as bay windows.
- The colour palettes for each precinct reflect the landscape character.
 - Hilltop Precinct - lighter, cooler colours reflects the existing eucalypt vegetation and openness of the woodland.
 - Lakefront Precinct - blue-greys, red-browns and ochre tones reflect the hues of the existing Angophora vegetation
- Maximum building height of 2 storeys for Hilltop and Lakeview Precincts.

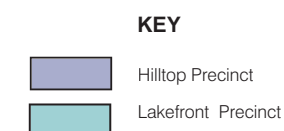




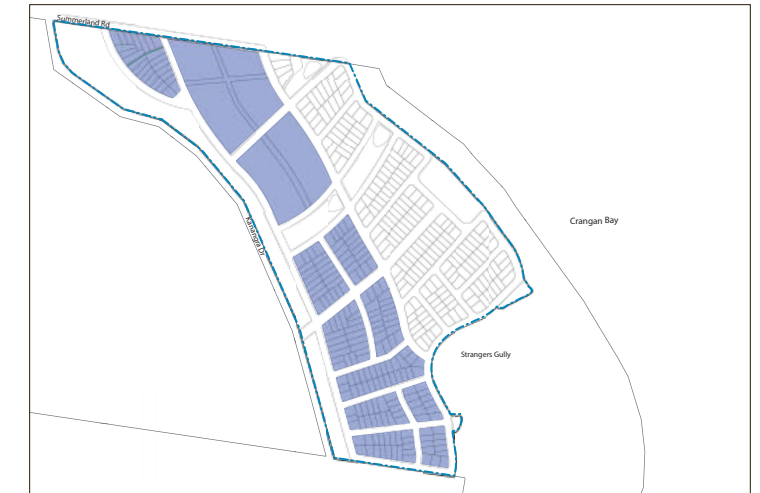
Figure A1.5.2 - Hilltop Precinct colour palette



Figure A1.5.3 - Houses with an architectural expression of horizontal proportions with a strong masonry base and lighter materials for upper storeys.



Figure A1.5.4 - Architectural features in natural or painted timber



Character Elements – Hilltop Precinct:

- One and two storey development.
- Cool grey, cream, and beige tones reflect the bark of the eucalypt forest.
- Exposed or rendered masonry define a strong base with lightweight cladding on upper levels.
- Natural or painted timber details complement the wall materials.
- Low roof pitches and generous eaves emphasise the horizontality of the built form.
- Small front gardens and consistent street alignments reinforce the village character.
- Generous backyards promote retention of existing trees and complementary native planting to encourage bush gardens.



Figure A1.5.5 - Low pitched roofs with wide eaves contribute to the horizontal proportions of the houses



Figure A1.5.6 - Cool creams and greys and beige tones reflect the existing vegetation



Figure A1.5.7 - Materials and finishes of exposed brick and timber are encouraged



Figure A1.5.8 - Illustrative streetscape character



Figure A1.5.9- Lakefront Precinct color palette



Figure A1.5.10 - Red tones highlight architectural features.



Figure A1.5.11 -Exposed rafters and wide eaves



Figure A1.5.12 -Illustrative streetscape character



Character Elements – Lakefront Precinct:

- One and two storey development sits within the tree canopy of the existing Angophora vegetation.
- Blue grey, reddish browns and ochre tones reflect the richness and contrast of the Angophora vegetation.
- Architectural expression of exposed or rendered masonry defines a strong base with lightweight cladding on upper levels.
- Natural or painted timber elements provide contrast with the masonry base.
- Low roof pitches and generous eaves enhance the horizontal proportions of house.
- Subtle elements such as exposed rafters provide detail in the shadows.
- Small front gardens and consistent street alignments reinforce the village character.
- Generous backyards promote retention of existing trees and complementary native planting.



Figure A1.5.13 -Screens for verandahs and decks provide sun shading and privacy



Figure A1.5.14 -Materials and finishes include masonry and timber



Figure A1.5.15 -Massing and form of integrated housing is articulated.

A2.1 Urban Structure



Figure A2.1.1 - Urban structure

- The main components of the proposed urban structure are:
- Access to the Gwandalan Estate is via two entry points from Kanangra Drive and Summerland Road:
 - The first is at the intersection of Summerland Road and Kanangra Drive at the north-western edge of the proposed development. The entry road follows the existing paper road on an east-west ridge between two drainage lines.
 - The other entry is on a local high point at the centre of the western edge of the proposed development. This is the start of the major east-west entry road that is located on the main east-west ridge of the site, connecting Kanangra Drive to the foreshore. It terminates at the Village Green.
 - The major north-south road follows the contours and terminates in a park to the north and conservation land to the south.
 - Clear pattern of north-south/east-west cross-axis. This grid-like structure provides permeability and allows the Gwandalan Estate to be implemented in stages.
 - Long blocks are predominantly aligned north-south on the flat terrain of the western part of the site.
 - Street blocks are predominantly aligned east-west in the eastern part of the site, maximising connections to the water.
 - Streets will define publicly accessible parks from private lots.
 - In accordance with bushfire safety requirements Asset Protection Zones (APZ's) are provided around the periphery of the site. Streets on the estate's boundaries contribute to the APZ's, thus minimising APZ's within private lots and defining conservation lands from private lots.
 - Land use is predominantly residential, with superlots to accommodate potential developments suitable for ageing in place.
 - Two urban parks are located at the eastern edge of the proposed development, adjacent to the foreshore reserve. Their location creates a buffer between the foreshore and development and allows the foreshore landscape to enhance the urban parks.
 - A bush reserve is created along the major drainage line in the Estate.
 - A secondary drainage line is located mid-block in the north-western block.
 - A landscape buffer along Kanangra Drive maintains and reinforces the existing landscape. The buffer will screen the development from Kanangra Drive.
 - All streets and parks are addressed by buildings to ensure passive surveillance, providing safety and security of the public domain.

A2.2 Proposed Hamlets



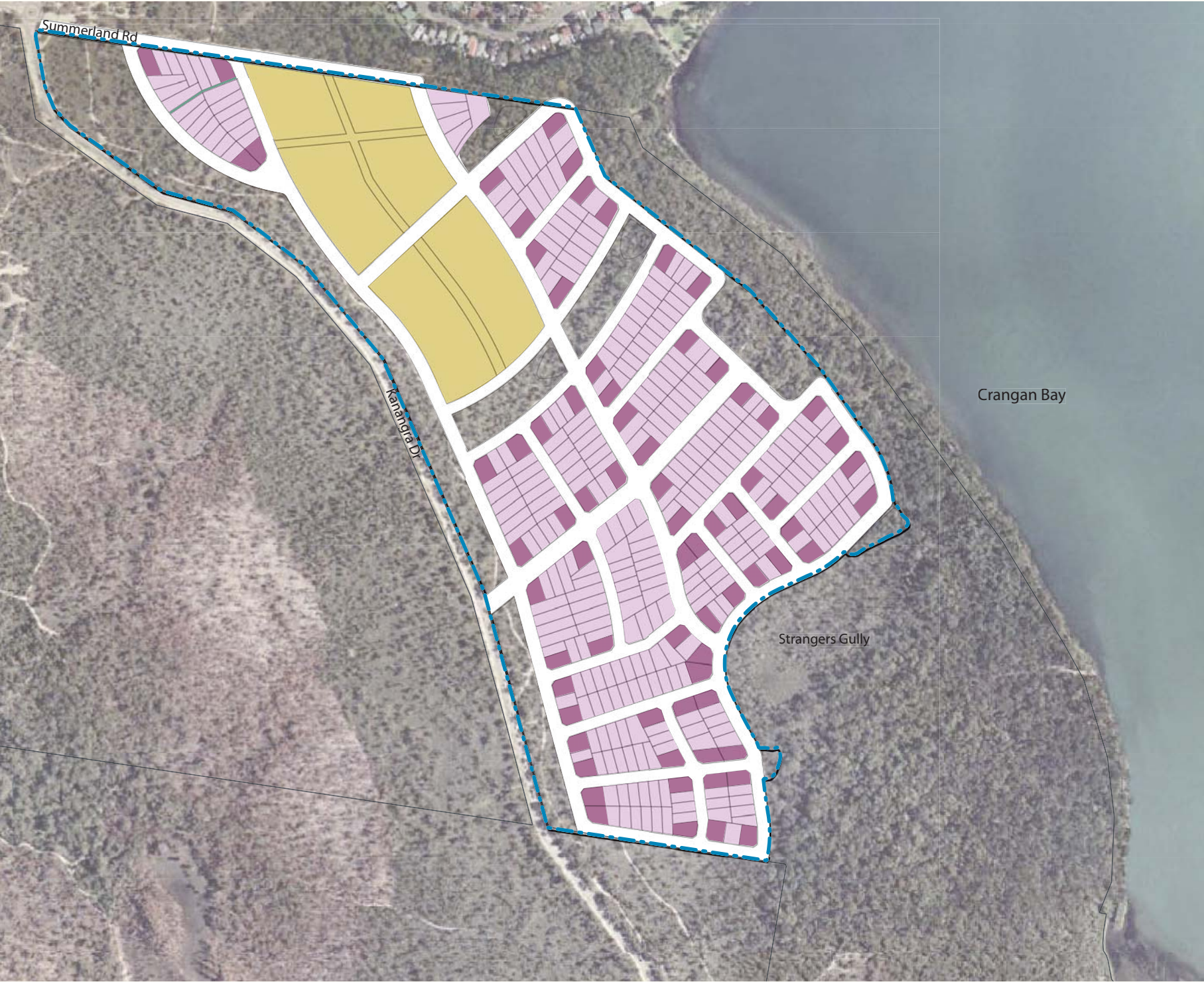
- Within the development footprint are two distinct hamlets;
- Northern Hamlet and
 - Southern Hamlet.
- To facilitate staging and to provide adequate servicing, the two hamlets have:
- An access entry road from Kanangra Drive, however both access streets will be provided in Stage 1.
 - An urban park,
 - A bush reserve separating the two hamlets,
 - Access to the foreshore.

Each of the two hamlets has a different role within Gwandalan Estate:

- Northern Hamlet**
- To promote housing choice within the Gwandalan Estate, two superblocks have been identified in the Northern Hamlet to accommodate retirement housing uses. The establishment of a retirement village will be dependent on market demand.
 - The minimum lot size for Village Lots is 450m² with a minimum 15m frontage.
 - Corner lots have a minimum lot size of 700m².
- Southern Hamlet**
- The focal point of the Southern Hamlet is the Village Green. It is located at the eastern end of the major east-west road.
 - The Southern Hamlet has a range of lot sizes with a various orientations.
 - The minimum lot size for Village Lots is 450m² with a minimum 15m frontage. Corner lots have a minimum lot size of 700m².

Figure A2.2.1 - Proposed Hamlets

A2.3 Built Form



Housing types have been developed to suit the lot sizes. The two types are:

- Village Lots:
- Detached housing
 - Minimum lot size of 450².
 - Minimum 15m street frontage.
- Village Corner Lots:
- Detached housing
 - Minimum lot size of 600².
 - Minimum 15m street frontage.
- Where necessary street setbacks accommodate bushfire Asset Protection Zones.
 - Privately owned external areas will include lawns and native planting.
 - No solid fences forward of the building line on lots allows the private domain landscape to contribute to the streetscape.

KEY

Seniors Living

Village Lots

Village Corner Lots

Figure A2.3.1 - Built form

A2.4 Open Space + Landscape

Landscape design principles are as follows:

Bushland Reserve

- An ecology based reserve will be located along the main drainage line in the estate.
- It will be a bushland park with a dense canopy of existing trees and rich shrubs and ground covers. Retention of existing trees will enhance biodiversity and retain ecological habitat and protect endangered communities.
- The development responds to the existing landform and the drainage lines and streets will be laid out to capture water in parks in bio-detention basins. The intention is to ensure water quality and quantity of flows into Lake Macquarie has zero impact. Modifications to landform will be carefully designed to minimise impact on the retention of existing vegetation.
- There will be provision for access ways through the Bushland Reserve. This will be done to minimise the need to cut and fill.
- The edge of the Bushland Reserves occur within the Asset Protection Zones. They will provide the potential for additional local recreation places in the form of linear parks with facilities for seating and walking.

Urban Parks

- Two new urban parks will be located on the eastern edge of the site, providing a range of activities that are easily accessible for all residents and visitors, and are contiguous with the conservation lands and the recreation opportunities provided by the foreshore.
 - The central park or Village Green is a 1.4 ha park will suit a range of community recreational activities. It will include large flat areas of grass and small nodes that will be adaptable for markets, fetes and community gatherings.
 - The northern park is a 0.5 ha park located on the north-eastern boundary by the creek bed and will provide terraces of intimate spaces for family picnics and barbeques.

Buffer zones

- A landscape buffer with a variable width of approx. 60m will be provided between the development area and Kanangra Drive. This area will protect the green outlook that motorists currently enjoy and will also protect the sensitive Angophora Inopina vegetation.
- The Foreshore Conservation Area will be retained in its current condition. This will protect views to the site from across the Lake. There will be provision for access ways which will be constructed to minimise the impact of cut and fill and reduce the removal of any vegetation. This will be subject to approval by the Office of Environment and Heritage NSW.



Figure A2.4.1 - Open space and landscape

A2.5 Access & Movement

The street pattern is set up to facilitate legible, safe and permeable pedestrian and bicycle movement and universal access around the site, linking the site with its foreshore, its foreshore parks and the existing services and facilities in Gwandalan.

- Street hierarchy is based on the following:
 - Primary streets include entry roads and a major north-south connecting street. These will be wide streets with medians which have a grand scale to represent their significance in the hierarchy. They will include footpaths on one verge, street tree planting in verges and medians, low ground plane planting, street lighting and parallel kerbside parking. Cycle routes will be shared on-street, in recognition of low traffic volumes.
 - Secondary streets include all local streets. They will include minimal carriageways and verges. They will have a scale that suits the landscape character designations. They will include footpaths on one verge street tree planting in verges, lawn in verges, street lighting at major intersections and parallel kerbside parking.
- Street lighting will be functional and will focus on minimising light spill without affecting safety, both for vehicles and pedestrians.
- A pedestrian accessway is to be located within the foreshore conservation area as desired by the existing residents of Gwandalan. This accessway will connect the existing settlement of Gwandalan with the hamlets of the Gwandalan estate along the foreshore, maintaining public foreshore access (subject to approval by the Office of Environment and Heritage NSW).
- Street reserves are to be used for reticulation of underground infrastructure services. Run-off from streets will be directed to bio-retention basins in adjacent parks and bush land areas.

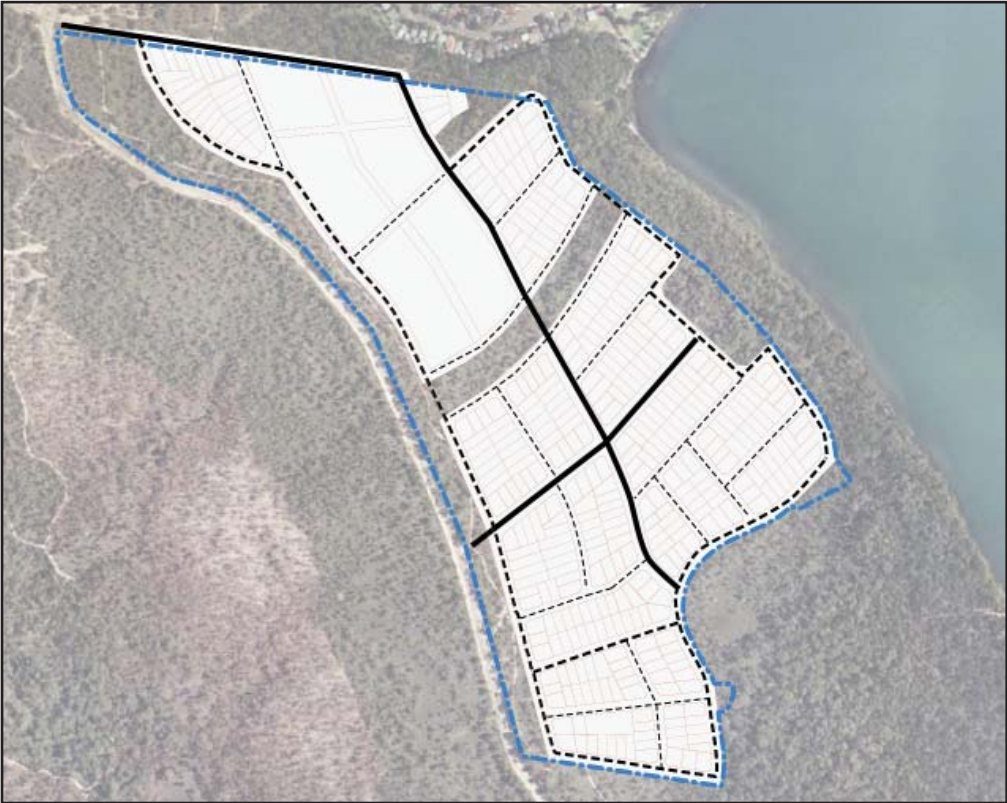


Figure A2.5.1 - Street hierarchy

Primary Road
Secondary Road
Tertiary Road

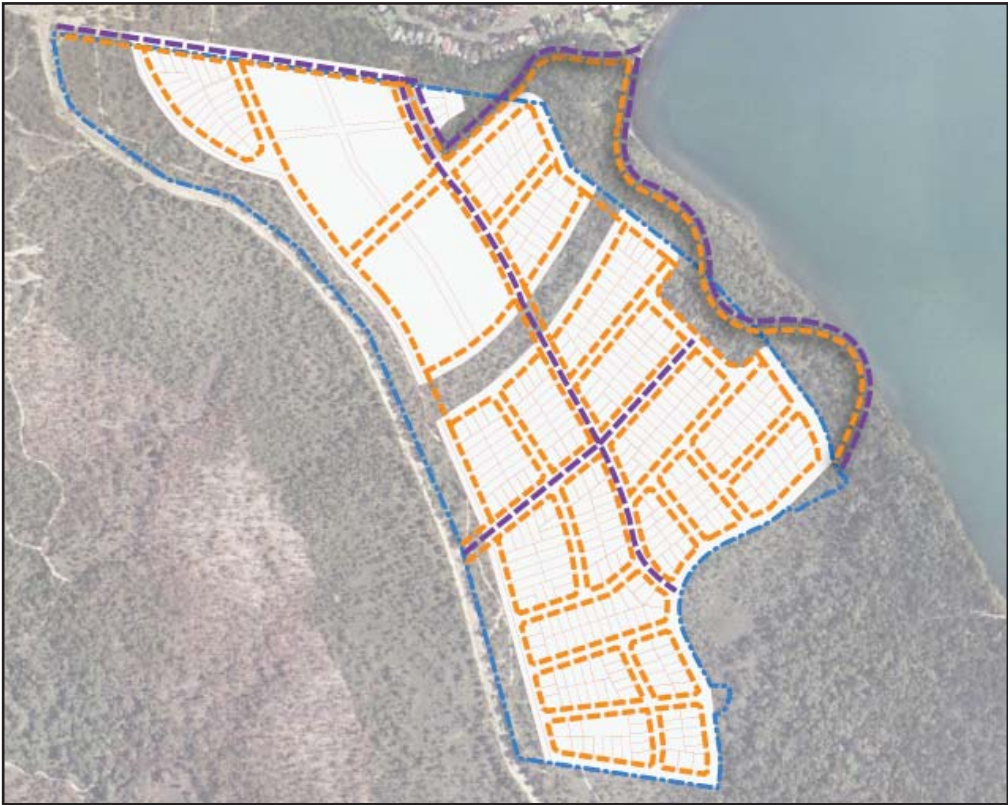


Figure A2.5.2 - Pedestrian and cycle paths

Footpath
Shared on-road cycle route



Figure A2.5.3 - Stormwater treatment

Drainage path
Bio-detention basin

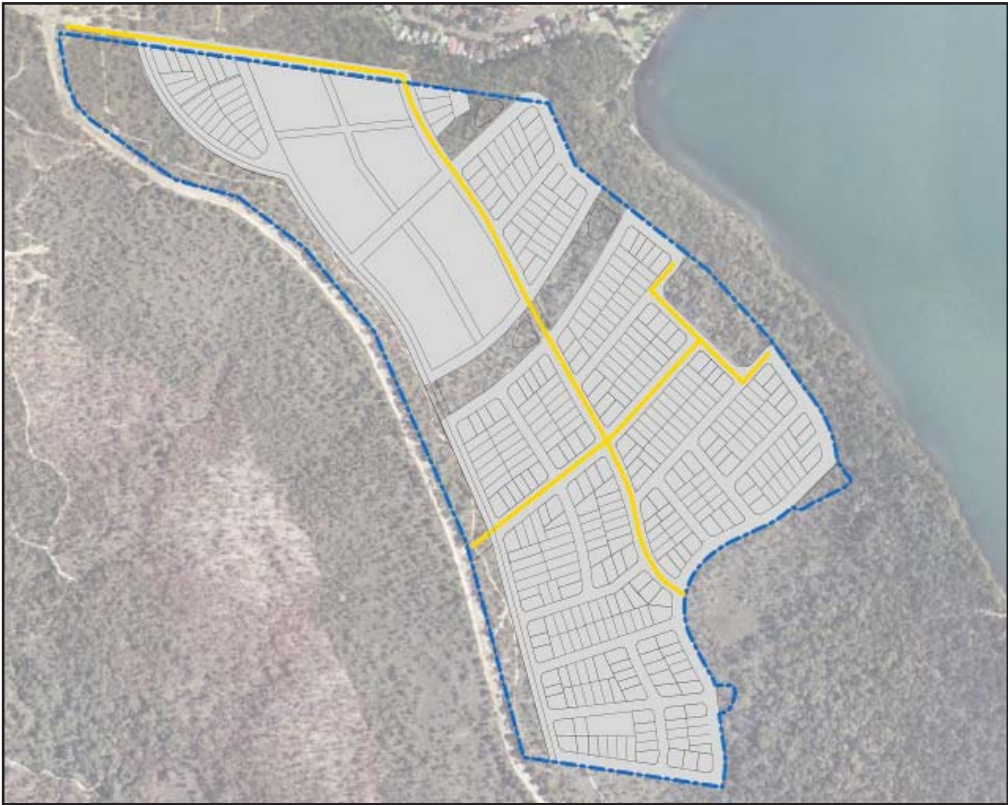


Figure A2.5.4 - Lighting

Street and park lighting

A2.6 Visual Impact

- The development footprint is set back an average of 100m from the water’s edge and retains the existing buffer of trees between it and the water. The topography and extent of existing vegetation will ensure that there is very limited visibility of the proposed development from other vantage points of Crangan Bay.
- Retention of the existing landscape along the foreshore protects the scenic quality of the foreshore of Crangan Bay and its contiguous vegetation.
- Vegetation buffer along Kanangra Drive screens the Gwandalan Estate from the view of passing motorists, thus maintaining the dominance of landscape on Kanangra Drive.
- The hamlets of the Gwandalan Estate are set on a plateau surrounded by taller forest and woodland. This minimises its visibility from the main road, the foreshore, the water ways and existing developments.

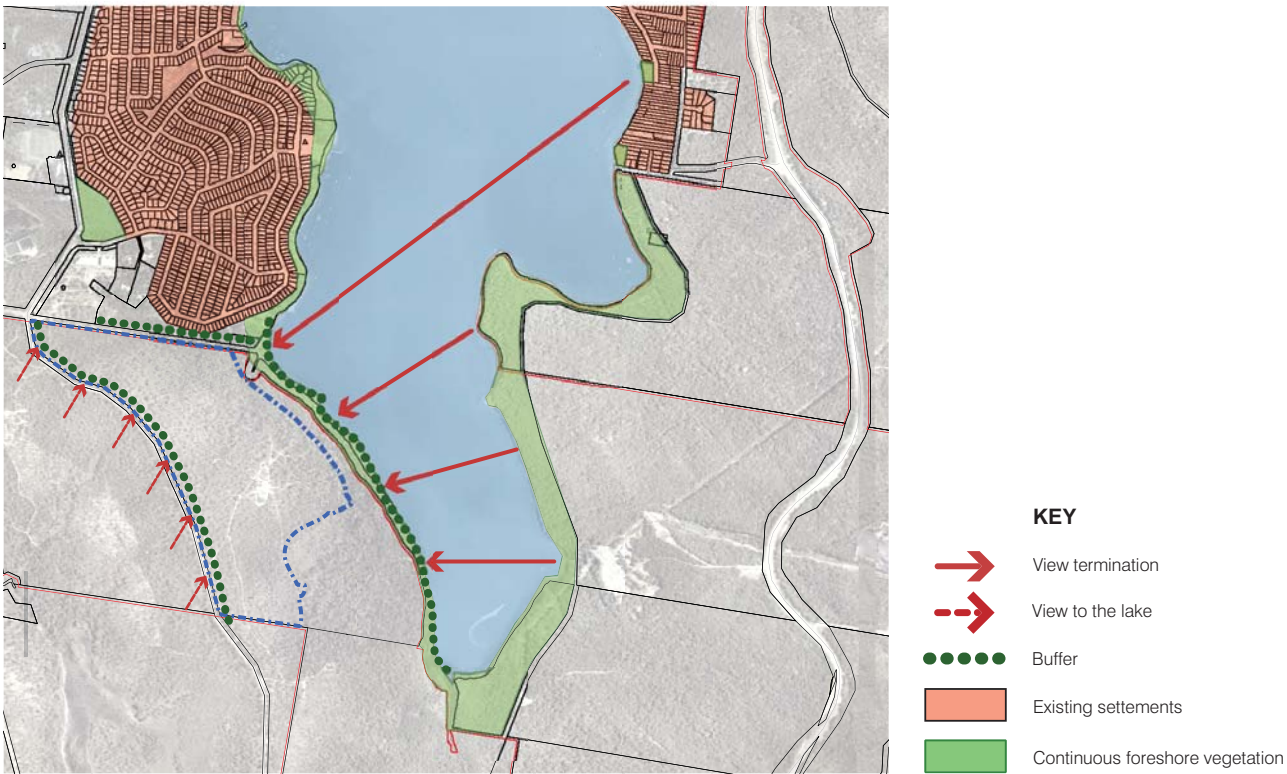


Figure A2.6.1 - Minimal visual impact due to the retention of existing trees within the foreshore reserve



Figure A2.6.2 - Existing views of the site from across the bay



Figure A2.6.3 - Existing views of the site from Gwandalan Lions Park

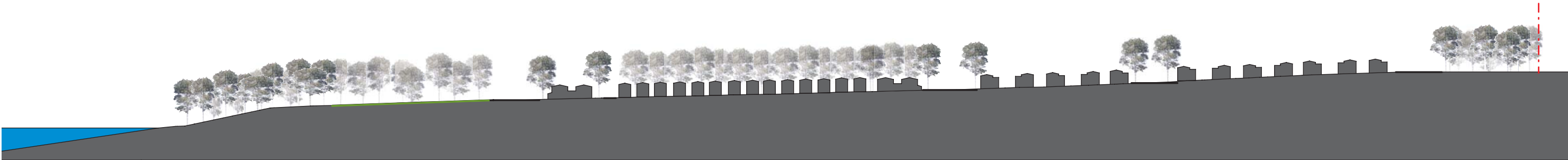


Figure A2.6.4 - Typical west-east section

A3.1 Development Staging

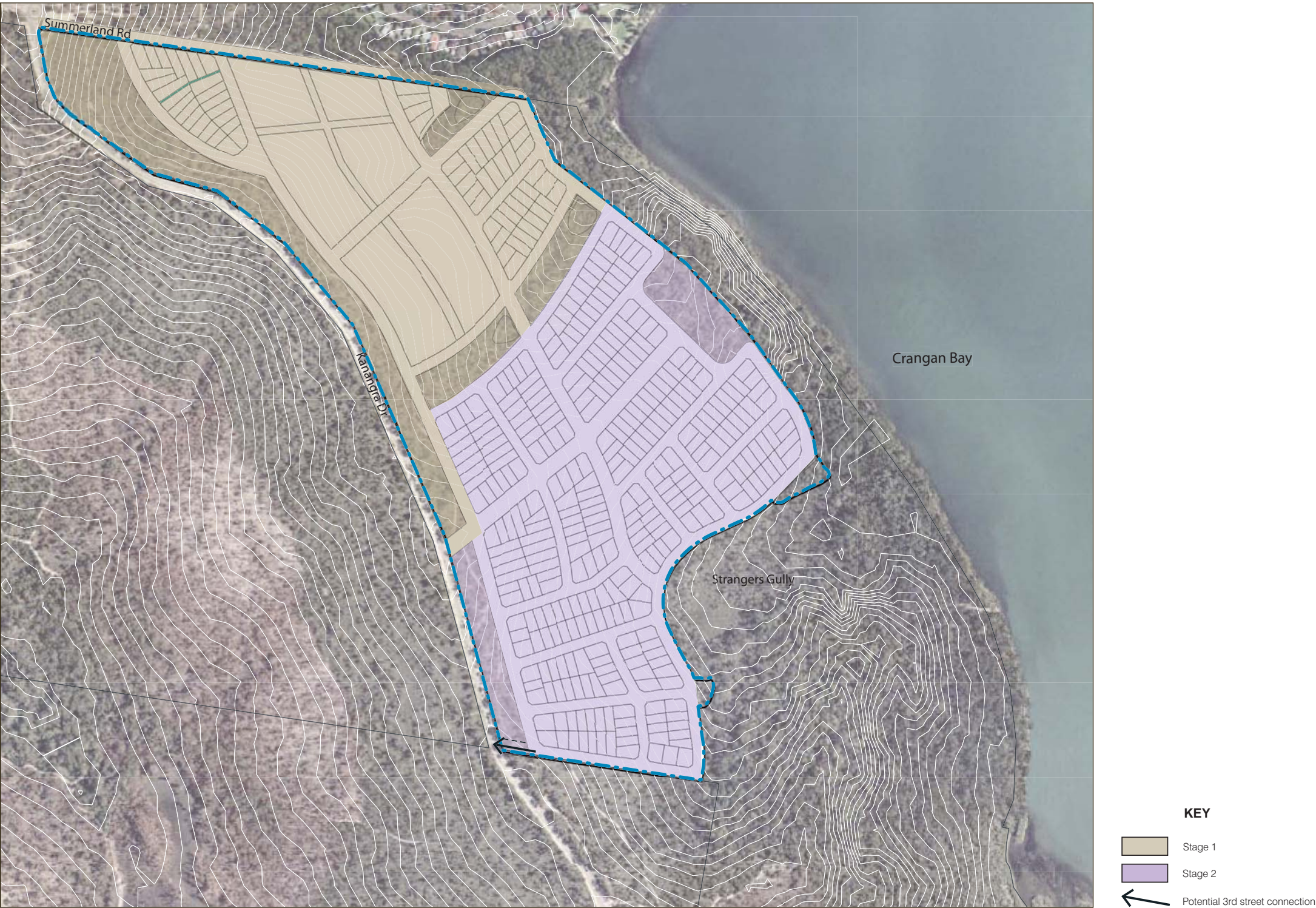


Figure A3.1.1 - Development staging

Two development stages have been identified. These stages relate to the two hamlets within the development footprint. Development staging is intended to be done as follows:

- Provision of infrastructure may be undertaken in two packages that service each of the hamlets.
- Lot and superlot development will be subject to market demand.
- Development of the various stages of infrastructure will be dependent on market demand.
- Delivery of the public domain and infrastructure in two stages is intended to be a robust mechanism for development. This ensures that services, roads and landscape are integrated. This benefits future residents and ensure that with each hamlet has a park and basic access will be provided.

Stage 1 includes:

- 66 lots with a 450m² minimum lot size.
- Potential for 199 seniors living dwelling units.
- Small park in north-east of the site.
- Delivery of the landscape buffer along Kanangra Drive, public domain and infrastructure.
- Ingress and egress off Kanangra Drive and Summerland Road.

Stage 2 includes:

- 321 lots with a 450m² minimum lot size.
- Centrally located park fronting onto the foreshore reserve.
- Delivery of the landscape buffer along Kanangra Drive, public domain and infrastructure.
- Potential for third street connection to Kanangra Drive from the south of the estate.