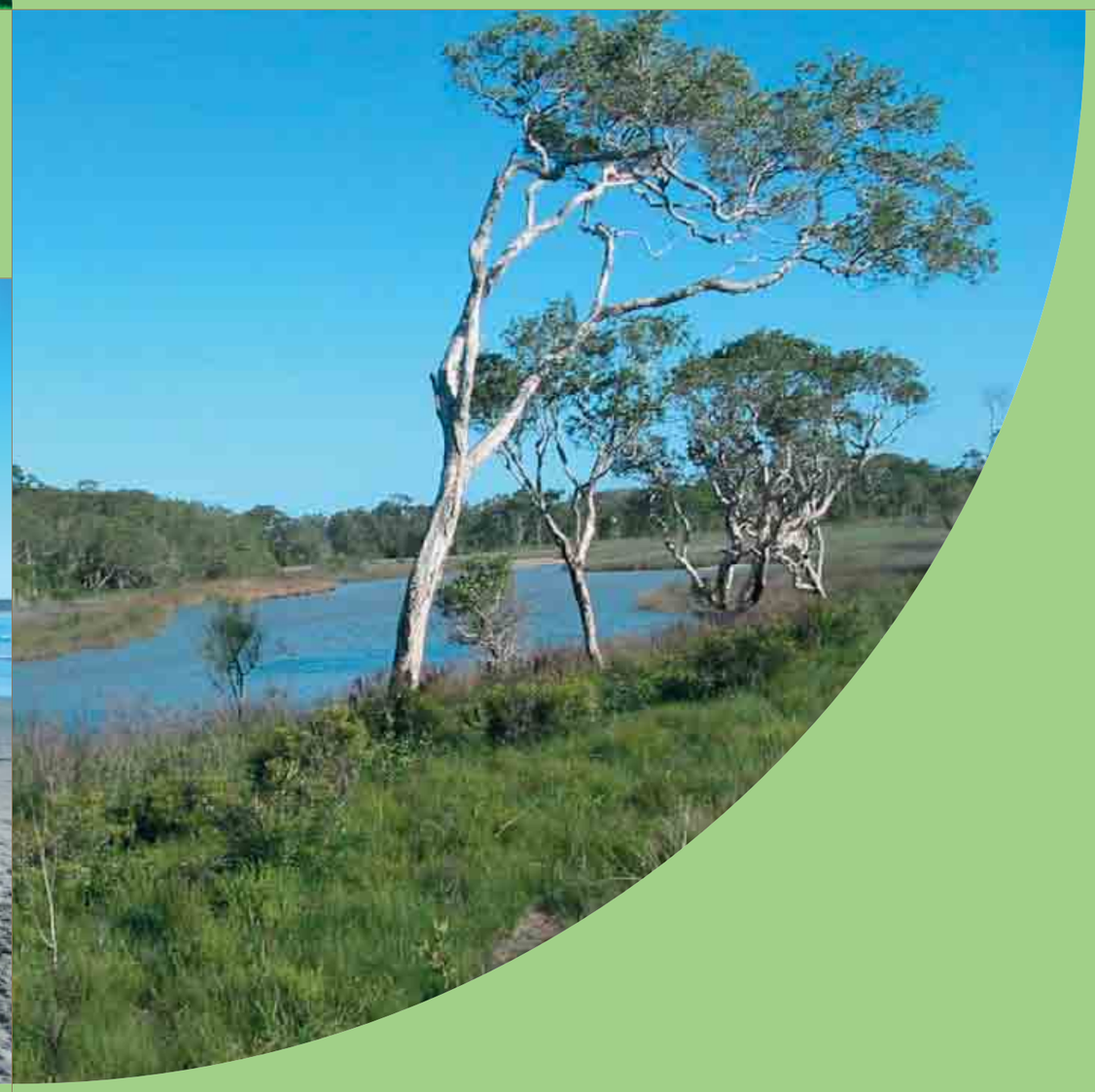
APPENDIX 2- REV 2

PROJECT DESCRIPTION

URBAN FORM AND LANDSCAPE CONCEPT

BY JHLA IN ASSOCIATION WITH MHDP

SANDY BEACH NORTH



MARCH 2009 - REV 2

PREPARED FOR SANDY SHORES DEVELOPMENT PTY LTD

Contents

1.0 Background

1.1 Introduction

This proposal serves to provide a high quality, environmentally responsible residential development, whilst enabling the improvement of the environment of the lake system through implementation of best practice in Water Sensitive Urban Design (WSUD). Fundamental to the development process is the preservation and long-term management of Hearns Lake and its surrounds.

The Urban Form Landscape concept Plan describes what the development will look like and how it should be developed. It includes detailed design criteria and graphic illustrations for individual elements that are intended for use. The analysis of opportunities and constraints for the site has been integral in the concept planning process, with appropriate consideration of flooding, riparian setbacks, flora and fauna and planning issues, with a number of development options for the site were considered .

Integral to this was adopting a principal philosophy of providing a framework for integration of natural and human settings, while at the same time ensuring the long term sustainable management of Hearns Lake and the coastal zone.

The design of the proposed development has been formulated following an extensive level of detailed analysis of the environmental attributes of the site and its context and setting. The site provides an opportunity for a sensitive coastal residential development which both respects the site's ecology, whilst creating a vibrant residential community.

The implementation of the vision for Sandy Beach requires a sound understanding of the physical attributes of the site, as well as an understanding of the regulatory planning framework.

That understanding is clearly present in the scope of the technical reports of their authors who have investigated and analysed the site and provided findings and recommendations regarding the parameters for the design of the proposed development.

This concept plan is a dynamic framework for delivering our vision for Hearns Lake. It establishes a clear structure for the scale and mix of development, infrastructure, community facilities and features.

Through the expertise within the design team, combined with unrivalled local knowledge of the applicant, this has is an exciting and functional design that will support the creation of a robust new community.

The design takes a holistic view to the discipline of masterplanning that not only addresses the physical aspects of the site but importantly, responds to market needs focusing on the lifestyle advantages and community benefits our places create.

The design solution for Sandy Beach North arises from an understanding of site constraints, market influences, principles of urban design and sustainability,the synergies that can be created with adjoining communities and the potential utilisation of many established partnerships.

Highlights of the Masterplan include:

- An enhanced open space system, with the protection of Hearns Lake paramount
- High quality, contemporary, modern Australian architecture, allowing for a diversity of house types and living options
- A linked open space network with a variety of parks, green spaces, trails and fitness circuits.
- Connectivity to Sandy Beach creating community linkages via pedestrian links and cycleways, reinforcing a healthy lifestyle focus.
- A detailed and wide ranging Water Cycle Management Strategy.
- Enhanced access to beach
- Orderly staging strategy that creates maximum choice
- Efficient and effective infrastructure
- Provides for road access and circulation which recognises the street hierarchy, separates pedestrian and vehicular traffic and provides for a "slow movement environment";
- Adopts water conservation and reuse principles of Water Sensitive Urban Design including site specific reuse proposals;
- Provides for a safe pedestrian and cycleway system;
- Develops site specific building envelopes and building form controls to guide the future development of the site;

The Sandy Beach North development will be a benchmark development in terms of achieving Ecologically Sustainable Development (ESD) and Water Sensitive Urban Design (WSUD) objectives. The concept design presented has considered sustainable management of the stormwater runoff, water conservation and water reuse/recycling into the residential, public domain, and other development areas on site. These aspects of integrated water cycle management has been achieved by incorporating WSUD techniques.

It is proposed that through the Residential Subdivision Layout, residents of Sandy Beach North will live in a vibrant community, in an integrated landscape of open spaces, leafy streetscapes and gardens – set within a restored coastal landscape, a landmark example of coastal residential development, raising the standard of development in Coffs Harbour and creating a liveable and rewarding residential community with sense of casual stylishness, where homes will be subservient to the landscape.

1.2 Design Vision

The residential development proposal presents the best possible outcome for the site, restricting development to the flatter areas of the site with minimal tree cover, minimising disturbance while preserving 50% of the site as open space, which in turn provides considerable setback from the lake edge, riparian zones, drainage lines and significant vegetation; enabling extensive revegetation and habitat creation, as well as protection of Aboriginal heritage.

In addition, the new community will support ongoing management of the site, which includes removal of pest plants and reintroduction of indigenous plants. Significantly the application of WSUD will enable substantial improvement of the lake water quality.

A fundamental component of the development vision is to restore the natural environmental quality throughout Sandy Beach North, in its streets and open spaces – creating a livable and rewarding residential community with sense of casual stylishness, where homes will be subservient to the landscape.

The design process has integrated environmental and urban design in a mutually supportive way and allowed the site's environmental processes to generate design solutions, which are both ecologically sustainable and respectful of the site.

The development will be founded on a clear set of principles including:

- Sustainability: Creation of environmentally responsible development at all levels in all areas.
- Legibility: Creation of a legible and identifiable community, through structured landscape and cohesive built form.
- Renewal: Rehabilitation of degraded landscape, recapturing the essence of the coastal environment.
- Integration: Integration of open space system, within precincts created around open space. House sites will be integrated into the setting by extending the streetscape into front gardens, extending the sense of scale of public domain.
- Ambience: Capturing views of the lake and vegetated backdrop.

The proposed sub-division layout offers a highly coherent urban form articulated by individual places and the sharing of common open spaces and natural resources. Similarly, the proposed development is not likely to impose a "significant impact" upon any of the terrestrial, estuarine or wetland communities, as the majority of these plant communities are to be retained.

1.3 Design Background

1.3.1 Opportunities and Constraints

The analysis of opportunities and constraints for the site has been integral in the concept planning process, with key consideration of flooding, riparian setbacks, flora and fauna and planning issues. With respect to key opportunities and constraints the proposed concept plan offers a highly coherent urban form articulated by individual places and the sharing of common open spaces and natural resources.

Opportunities

- Internal views within the site,
- preservation and revegetation of remnant vegetation,
- the proposed upgrade of Pacific Highway and associated access,
- establish a 'gateway' statement at future Woolgoolga interchange,
- create a community park within the estate,
- opportunity to manage Hearns Lake,
- to create development that is appropriate to the location and provides a basis for protection and improvement of the natural environment
- opportunity to protect and enhance the natural and recreational values of the coastal lake and reserve, working in partnership with local environmental groups,
- opportunities to improve foreshore access, whilst protecting coastal vegetation,
- provide a range of housing types within the development,
- opportunity to demonstrate best practice Water Sensitive Urban Design, and ESD principles to assist in the protection and enhancement of Hearns Lake, and

Constraints

- Ecological constraints – scattered vegetation clustered throughout the site,
- the Pacific Highway corridor as a potential noise source impacts on the potential development along the western edge of the site,
- fire protection zones required adjacent to remnant vegetation as per the Rural Bushfire Guidelines,
- restricted access points along the Pacific Highway.

Key

1 Potential Development Areas
2a Permanent Access from existing Sandy Beach
2b Long term Access from Pacific Highway via future interchange
3 Interface with existing community
4 Internal Views
5 External Views
6 Riparian Corridor (Wallum Froglet)
7 Noise Attenuation
8 Conservation and Management of existing vegetation
9 Lake Management
10 Existing Easements
11 Movement of Wallum Froglet

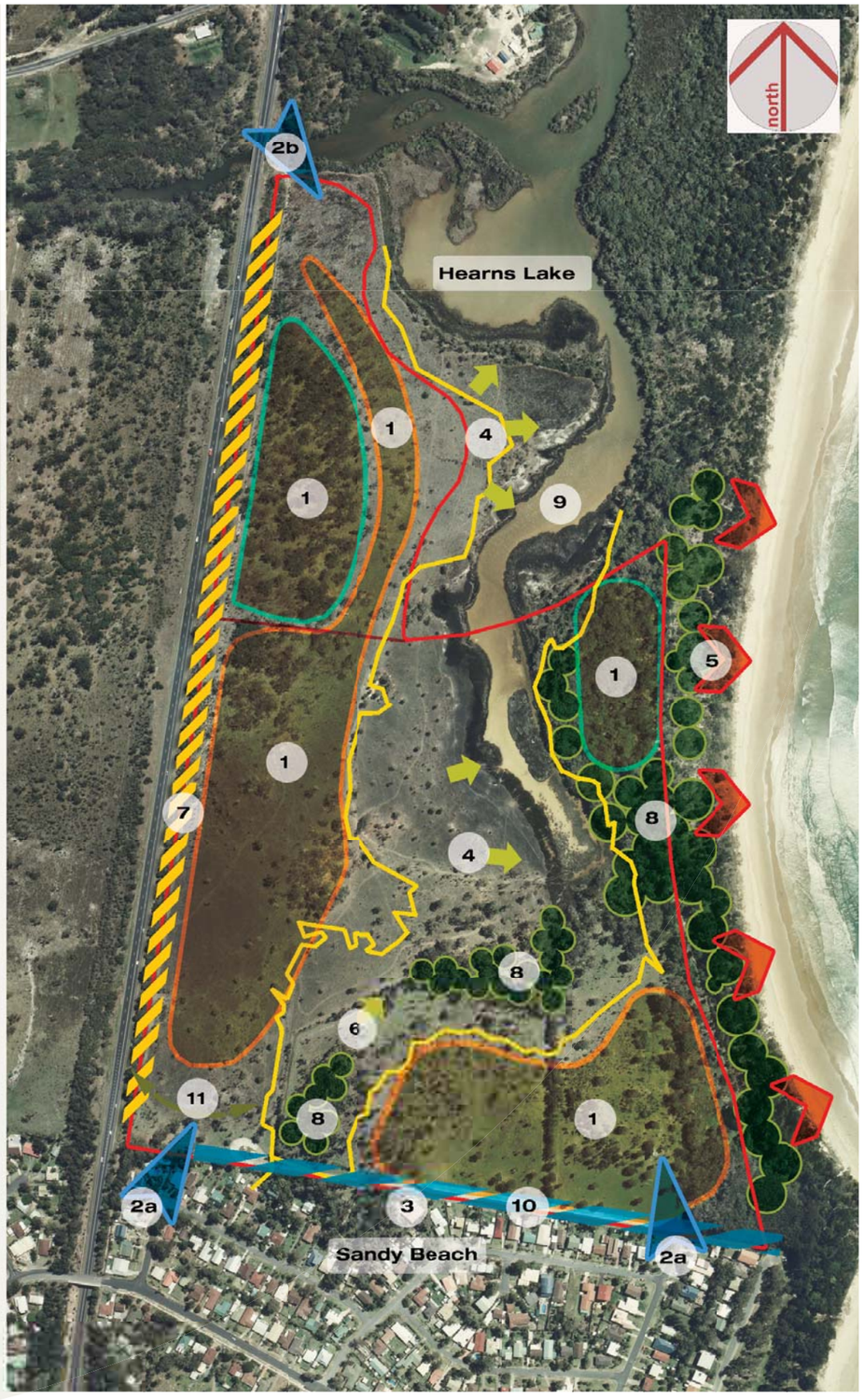


Fig 1 - Site Capability Plan

1.3.2 Design Options

A number of paramount and fundamental factors have guided the formulation of the preferred development option for the site. These factors include: -

(a) the preservation and long-term management of Hearns Lake and its surrounds;

(b) enabling the improvement of the environment of the lake system through implementation of best practice in Water Sensitive Urban Design (WSUD); and

(c) to provide for the sustainable integration of the natural environment with the proposed man made settings to ensure the promotion and co-ordination of the long term ecologically sustainable management of Hearns Lake and the coastal zone.

The Applicant and its consultation team undertook consultation with local and state authorities as part of the fact finding studies to present and discuss design options during the design process.

The consultant team reviewed the comments and had regard to them in formulating the design of the proposed development.

An appropriate update of the earlier supporting documentation (the Concept Plan lodged with the Department in late 2005) has taken place for the purposes of preparing this EA.

Following the submission by the Applicant in November 2005 of a Concept Plan and a Preliminary Assessment in January, 2006, on 20 October, 2006, the Department of Planning (the Department) issued Director-General's Requirements for the Environmental Assessment of the proposed residential subdivision (the DGRs).

Fig 3 - Design Option Dec 2004

Fig 4 - Design Option Nov 2005

Fig 2 - Sandy Beach environs looking north

A number of development options for the site were considered with the principal philosophy of providing a framework for integration of natural and human settings, while at the same time ensuring the long term sustainable management of Hearns Lake and the coastal zone.

The analysis of opportunities and constraints for the site has been integral in the concept planning process, with appropriate consideration of flooding, riparian setbacks, flora and fauna and planning issues.

The proposed sub-divisionlayout offers a highly coherent urban form articulated by individual places and the sharing of common open spaces and natural resources. Similarly, the proposed development is not likely to impose a "significant impact" upon any of the terrestrial, estuarine or wetland communities, as the majority of these plant communities are to be retained. The development has been designed, to protect existing plant communities on the site.

1.3.3 Consultation with DoP

There has been extensive consultation with the Department during the development of the design. These commenced in December 2004 and have been ongoing. Using the assessment outcomes, the Applicant prepared a proposal which was first presented to the Department in November, 2004 and subsequently refined in later meetings and discussions.

In November 2005, the Applicant lodged a Concept Plan with the Department for approval for the subdivision a concept of the design and development of the site. The lodging of that document followed an extensive consultation process over the previous twelve (12) months with the then Department of Infrastructure Planning and Natural Resources (DIPNR) in the preparation of development options for the site.

A summary of those consultations with the DoP and RTA is as follows: -

Meeting 1 – 21 December, 2004

This Meeting was held at DIPNR's offices. It was chaired by Mr. David Mutton of DIPNR. The purpose of the Meeting was to present a draft Masterplan for the development of the site.

Meeting 2 – 18 January 2005

The Meeting of 21 December, 2004 was followed by a meeting held with the offices of DIPNR with Mr. Pradesh Ramiah. The following is a summary of key outcomes from the meeting held on 21st December 2004 and responses presented at the Meeting on 18 January 2005.

1. Setback from Hearns Lake

The revised layout presented on 18 January 2005, incorporated setbacks of 90-100m from Hearns Lake edge to the proposed residential edge, with minor variations, so as to achieve practical design outcomes. Mr. Ramiah commented that, within the overall scheme, minor reductions in setbacks of less than 100m would be acceptable, given the desirable setback had generally been achieved.

2. Roads Bordering Open Space

The revised layout presented on 18 January, 2005 provided road edges to all open space areas, which met with approval from Mr. Ramiah, as accepted design practice.

The Applicant advised that the proposal sought to maximise rear access and subsequent improved solar access. To achieve this it was indicated that it may require extending the layout into the Pacific Highway Scenic Protection 7(b) Zone as well as within the 100m setback to Hearns Lake.

Mr. Ramiah advised that given the benefits of rear access, minor encroachment into the Scenic Protection 7(b) Zone and within the 100m setback to Hearns Lake would be favourably considered as the overall outcome was to the betterment of the project as improved management of open space would be achieved with edge roads.

3. Beach Precinct(s)

For the beach precinct in the South East corner of the site, Mr. Ramiah acknowledged that the lots may straddle the Coastal Protection 7(a) zone so long as buildings were setback the required distance from the Coastal Protection 7(a) Zone.

Meeting 3 – 7th March 2005

At this third Meeting a further presentation was made to Mr Ramiah and colleagues at Deacon's Solicitors Offices. The purpose of that Meeting was to present a revised Concept Plan arising out of the earlier Meetings and discussions. It was intended as a prelude to the final preparation and submission to DIPNR. A copy of the material presented at the Meeting is Appendix 2 (2)

The Concept Plan was very well received, with Mr. Ramiah suggesting ongoing correspondence to refine the details and to determine the appropriate method of presentation. This was undertaken by several meetings and conference calls prior to the submission of the Concept Plan containing the preferred option, to the Department in November 2005.

The preferred option is considered to be one that provides an appropriate response to the sensitive environmental factors pertaining to the site and that produces an ecologically sustainable development. This conclusion is supported by the subsequent responses to the matters raised in the Director General's Requirements and the detail in the respective Technical Reports referred to in the Appendices, that support the proposed development.

Meeting 4 – 26th October 2007

Meeting with Ray Lawlor, Coastal Assessments, Major Project Assessments, NSW Dept of Planning. The purpose of that Meeting was to discuss response to draft submission.

Fig 5 - Perspective view looking east of proposed residential development

2.0 Development Description

2.1 Design Concept

The concept plan for the residential layout comprises four distinct precincts, separated but still connected by open space, drainage and vegetation corridor, which both respects and takes advantage of the lake and coastal setting.

The four precincts are:

- beach precinct centrally located on the eastern edge of the site between the lake and beach front,
- southern precinct between the southern end of the lake and the existing Sandy Beach residential development,
- south Western precinct located between the western edge of the lake and Pacific Highway, and
- northern precinct between the northern portion of the lake, Double Crossing Creek and Pacific Highway.

It is proposed to create approximately 280 residential lots ranging in size from 400 sq m to 2000+ sq m, with an average lot size of 550 sq m.

Each precinct will develop an individual character based on its location, views and development diversity/character, whilst maintaining a coherent built form. These character areas respond to the natural environment, views and the urban street pattern.

Residents of Sandy Beach North will live in a vibrant community, in an integrated landscape of open spaces, leafy streetscapes and gardens – set within a restored coastal landscape, a landmark example of coastal residential development, raising the standard of development in Coffs Harbour.

At Sandy Beach it not intended to create an architectural 'style' for the community. Rather, it is intended to define a 'character' of architecture, having regard to its location, context and zoning objectives. To ensure the development has a strong contemporary architectural character, house design must comply with the guidelines, with established principles, and with controls that assist the designer of the house and garden to respond effectively to the relationship of neighbouring houses and to ESD issues, and have good environmental sustainable design. For this reason the architectural design approach for houses and gardens will be required to embrace sustainable building design practices. This should help to increase energy efficiency of homes.

The landscape treatments will not be unique and separate from the surrounding area. Nor will it be a facsimile of the existing native vegetation community. The proposed landscape character is a balance between the native coastal heath and open woodland with the demands of a new low-key, visually unobtrusive coastal residential development.

The numerous mature trees in the streets and parks provide ample shade encouraging walking along the local roads leading to and across the lake, over the sand dunes and to the beach.

The visual emphasis of the landscape treatment is "bush to the boundary": The road verges and public open spaces support abundant plant life stretching from boundary to boundary and visually 'engulfing' the road and services, giving the sense that the development is nestled amongst the trees and vegetation, suggesting that this 'new' community has been here a long time. That it has worked in with the landscape and not imposed itself upon it.

The proposed sub-division layout offers a highly coherent urban form articulated by individual places and the sharing of common open spaces and natural resources. Similarly, the proposed development is not likely to impose a "significant impact" upon any of the terrestrial, estuarine or wetland communities, as the majority of these plant communities are to be retained. The development has been designed, to protect existing plant communities on the site.

The overriding philosophy of the design is that the setting and landscape dominate the built environment.

The site planning has been strongly influenced by the bio-diversity values of Hearns Lake, the coastal environment and the opportunity for their conservation and rehabilitation, with 50% of the site have been set aside for open space and conservation purposes.

The objective is to retain areas that are undisturbed and to re-vegetate areas that have been disturbed, with the aim to reinstate and conserve indigenous vegetation and maintain biodiversity. Particular attention has been paid to this aim through:

- generous riparian setbacks from lake edge,
- retention of visually significant stands of vegetation, which are focal points within the layout, and
- protection and enhancement of drainage lines and associated vegetation and habitat for Wallum Froglet species.
- all open space areas, which includes the riparian zones and stands of trees to be retained are bordered by road edges,
- development generally has been restricted to the flatter and higher areas with minimal tree cover, thereby minimising impacts to the overall site, particularly sensitive lake and riparian areas.
- improving beach access, management of the coastal dune system, and protecting the vegetated coastal edge

2.2 Visual Amenity

A visual analysis taking from various points outside of the site demonstrate the development will limited visual impact relative to surrouding areas, and although the development will have some visual impact it will be seen in the context of the landscaping on the site merging with the existing lake and dune vegeation.

A key issue in developing the site is the consideration of how the development is viewed from the surrounds. Visibility into the site is restricted from immediate areas. Given the nature of the existing environment there will not be any blocking of views of the beach and the water from public viewpoints around the site.

- The elevation of the site combined vegetated buffer along the Pacific Highway restricts views into the site and Hearns lake from both the highway and land immediately to the west of the site.
- The elevation of the dune and the density of vegetation limits views of the beach from eith the site or areas adjacent the site
- the configuration of the existing existing Sandy Beach suburb to the south restricts views onto the site, excluding two storey properties.
- From the cararvan park there is limited visibility of the site, restricted by both vegetation and distance.
- From surrounding areas of higher elevation there are distant views of the site

The development will be constructed to the highest standards of design and the proposal has adopted the principles of sustainability both in relation to the layout of the site and the design of infrastructure and housing..

The Landscape Concept provides for landscaping which will soften the built form and contribute to the overall setting of the proposal. The landscaping will have regard to the natural features of the site including.

The landscape proposals for the site will provide for a development in a landscaped setting. The proposed landscaping will soften the built form and contribute to the overall setting. The opportunity has been taken to integrate a vegetated core which runs through the site with fingers stretching along the access ways to the buildings.

The landscaping will be carried out in distinct zones providing settings which reflect the nature of the area. The dune area will be revegetated under the provisions of the Management Plan and the majority of vegetation in the 7(a) area will be retained, weeded and protected with buffer planting, and where affected by sub-division works rehabiliated.

2.3 SUSTAINABILITY

2.3.1 Environmental Sustainable Design

We propose an integrated approach to urban ecosystem planning. The public open spaces and all built facilities are considered as an integrated environmental setting. Environmental best practice and ESD principles will be incorporated in the design and management of the residential areas and open space.

Energy performance, urban microclimate and water cycles will be approached in relation to one another: for example, roof-top and recycled water feeds the ornamental and bio-climatically functional water bodies; the open spaces mitigate against heat island formation; planted wind breaks buffer cold winter winds; energy conscious building design blurs the boundaries between open and indoor environments without compromising on maximum human comfort.

Finally, the overall open space system will be designed to boost regional biodiversity. Sandy Beach North is a development aiming at all times to achieve best practice in urban and environmental design, which is captured by the following design responses:

- to make the most of the site's natural assets and apply best practice water sensitive urban design,
- to create a site layout which has a clear urban structure that maximises permeability and legibility and allows easy pedestrian access to open space, local community facilities and transport routes,
- a development that provides a wide variety of lot sizes and configurations to promote diversity of housing, with potential for innovative design solutions whilst mainataining a highly coherent urban form,
- Alignment of streets and orientation of lots so that every house captures natural sunlight, allowing application of integrated passive solar design principles,
- a place where innovative and adaptive homes, designed for the contemporary lifestyles and truly responding to the coastal climate of northern NSW,
- adopting a subdivision layout and Architecture based on climate responsive design and passive solar design principles, including optimised north orientation for maximised solar access for living spaces and for solar hot water systems, response to topography and prevailing winds, use of insulation, glazing and shading, and maximise lot efficiency through incorporation of largely regular blocks
- maximising garages off rear lanes and special access courts to create positive street address and help create high quality public domain, as well as continuity in the drainage bio-swales.

2.3.2 Sustainable community culture

This principle seeks to facilitate the development of social capital both within Sandy Beach and to the broad community with new residents encouraged to join existing local groups, volunteer to support community initiatives and be involved in local community events and activities. Strategies include:

- a partnership with Council and local community-based organisations
- support for a community driven place-making and arts program;
- commitment to community consultation throughout the development phases
- implementation of a Welcome Program for new residents; and fostering of a garden culture is to be supported.
- Healthy community with supportive walking, cycling and bus infrastructure

Additionally, the Masterplan recognises the importance of local employment to the quality of life of future residents. Strategies for this principle include:

- the provision of housing products with studios and offices suitable for home businesses;
- quality broadband access to all homes;

A major element of all WSUD implementation is a community education strategy that reinforces the benefits of the water cycle treatment measures. This will be implemented through a series of seminars, on-site presentations to new residents, brochures and educational pamphlets for local school students.

A value driven approach has been taken in preference to an issues based approach, since values will tend to remain fairly constant over time, whereas issues will inevitably continue to change and evolve. The following values have been identified through the community consultation process and in consideration of the requirements of relevant legislation and policies:

- To conserve biodiversity and maintain ecosystem function of Hearns Lake
- To ensure that the use and management of the foreshore and 7(a) areas is in keeping with NSW Coastal Policy 1997, the Guiding Principles of Ecologically Sustainable Development and other relevant legislation and policies
- To provide for community use of and access to the land in such a manner that will facilitate the ecologically sustainable use of the foreshore and minimise and mitigate any disturbance on the foreshore caused by community use;
- To maintain the foreshore as a transition area between the aquatic and the terrestrial environment, and to protect and enhance all functions associated with the foreshore's role as a transition area;
- To ensure the principal values of the foreshore are protected and enhanced
- Street tree planting in the immediate proximity of the conservation areas to reflect indigenous vegetation of the site
- The vegetation and landscape of the foreshore contributes to the informal and natural character of Coffs Harbour.
- Vegetated sand dune creating a visual buffer between the beach and the residential area.

Fig 6 - Proposed typical open space / landscape treatments

2.4 PROPOSED SUBDIVISION LAYOUT

The concept plan and its urban form is a realisation of the vision and key design objectives and the physical attributes of site, notably:

- Hearns Lake and riparian setback,
- vegetation cover, particularly heavier remnant cover within the northern and south western portion of the site,
- drainage corridors running into the site from existing Sandy Beach suburb and associated vegetation,,
- water management, particularly flooding and protection of Hearns Lake,
- proximity of Pacific Highway and associated noise and access implications,
- existing Sandy Beach suburb to the south,
- improving beach access and management of the coastal dune system,
- landscape to reinforce significance of views onto and across the lake,and
- A sustainable place where the natural environment is respectedand where the community can grow and prosper

Key

Potential Development Areas

Proposed Road Verges

1 Collector Road
2 Entry Road (s) from existing Sandy Beach
3 Pacific Highway
4 Long term access via future Woolgoolga interchange
5 Conservation Areas
6 Parks
7 Heritage site - ISF2
8 Heritage site - SBN1

Fig 7 - Site Concept Layout Plan

Home

- Consumer choice and diversity.
- Innovations of new housing typologies.
- High quality, contemporary, modern Australian architecture.
- Clear, workable design guidelines to control quality and encourage creativity with equitable access to housing for all

Infrastructure

- Flexibility and opportunities to work from home.
- Use of maximum broadband connectivity.
- Incorporation of a suite of WSUD measures into the landscape design, combining practical elements with amenity for residents.
- Provision of cycleways and footpaths
- The water cycle management plan provides a fully integrated system that provides a strong balance between open space function and design, regional riparian corridors, fauna and flora habitat corridors, whilst providing storm water polishing and storm event retention capacity.
- Provision of appropriate community facilities.

Design

- Distinct neighbourhoods for people.
- Differentiated products to create diverse streetscapes.
- Extensive and accessible open space system.
- Respect and enhance the environment.
- Embrace natural features.
- A safe and secure place.
- Allotment orientation to maximise passive design options.
- All homes within walking distance of public transport, community facilities and local shops.
- Incorporate best practice for stormwater quality control as part of our plan for Water Management for the site, that is intrinsically linked to the open space structure and streetscape.

Place

- 'Village heart' central open space focus where the community can meet and socialise.
- Community facilities, programs and support.
- Learning as a core with easy access to local schools and childcare
- A place for wellness and healthy living with access to passive and active recreation opportunities.
- Celebration and preservation of natural features and environment.
- Theming and public art to create interest and ownership.
- Enhanced beach access

Location

- Access to existing facilities and services in Woolgoolga and Sandy Beach, creating community and recreational opportunities.

3.0 Urban Form and Architecture

3.1 Lot Design

As part of the concept plan design, potential lot arrangements were design in conjunction with the propsed road layout and public space to determine the most effective lot design and built outcomes for the locality.

3.2 Lot Orientation

The precincts were broken into their orientation according to their road frontage. This has implications on solar access to living spaces, potential for overshadowing of adjacent properties and location of garages in the streetscape.

Sites on the south side of the road frontage were identified as the most problematic in normal subdivisions as normally the garage would be placed on the north side. This would create a block to solar access, which should be avoided.

The resolution to this issue was to create as part of the subdivision rear laneway access particularly to the South oriented lots. This has the two-fold advantage of providing greater ability for solar access as well improving the streetscape appearance.

The houses would still have a conventional streetscape appearance and address, but without the disruption of garages and driveways.

All houses would have pedestrian access from the street and access to all visitors from the street via pathways. Where bio-swales occurs low scale timber bridges would be provided. Services such as collection of garbage and recycling would remain from the street frontage and not via rear lanes.

All residential buildings that face a Collector Road will 'address' the street and provide an active frontage to that street.

3.3 Road Priorities

The major roadways include the roads linking the three entries to the site., secondary roads accessing the South Precinct and the South-West Precinct and minor lanes or driveways.

The main implication for the architectural parameters was to identify that the architecture of the properties which front the major roads should be of a quality to enhance the overall streetscape and be a reflection of the quality of the subdivision in general.

The resolution was to set the garage location with the lot subdivision, and include grouping of garages or removing garages to rear lane access to reduce the visual impact.

Wherever possible, garages were allowed to be visible on only one side of the street. This allows significant vegetation of the road reserves and a quality streetscape development.

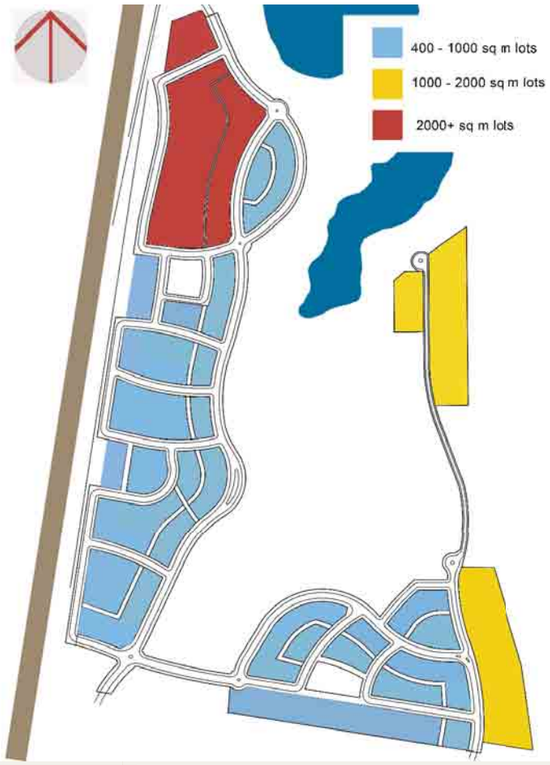


Fig 8 - Lot Density

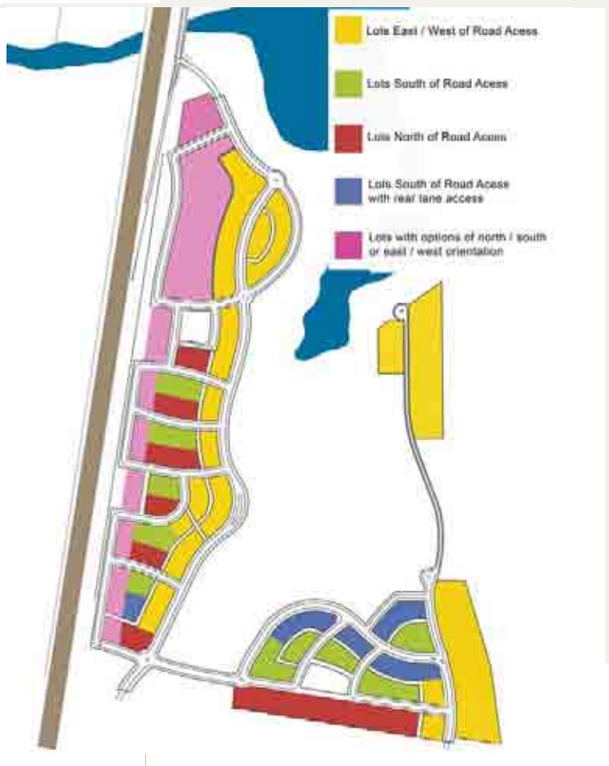


Fig 9 - Lot Orientation

3.4 Lot Sizes

The ranges of lot sizes were identified as having an implication on the architectural parameters. The lots sized between 400–500 sq m were identified as being appropriate for attached dwellings to maximise practical open space.

3.5 Site Sensitivity

The analysis of the potential site sensitivity included was prepared as an overview only and not based on detailed site observation. Further analysis of the site sensitivity has been carried out as part of the concept plan development, which may further advise the lot arrangement and architectural treatment.

As an overview, three areas were identified as impacting on the architectural parameters. The Dune area was identified as requiring special treatment in terms of structural design, excavation and landscaping. The Waters edge area, being the sites that bound Hearns Lake, require special treatment in terms of flooding prevention, effect on riparian zone, water runoff and landscaping. The final and level sensitive area identified was the area with more dense existing tree cover. It is proposed to retain as much existing vegetation as possible, which will influence the lot arrangement and architectural outcome.

The Pacific Highway provides a definitive western boundary to the site and requires that the subdivision design takes into account the visual impacts from the highway and acoustic impact from traffic noise. The northern and eastern boundaries of the site are adjacent to estuarine habitats. This requires that the combination of the design of the subdivision, buildings and roads provide adequate buffers to any proposed residential lots and, environmental protection/conservation areas and open space areas proposed for active/passive recreational purposes.

3.6 Building Massing

One of the resolutions for the subdivision was to control the architectural outcomes in terms of number of storeys.

The control of architecture will ensure buildings will not exceed a height of 8.5m above natural line and there will be sufficient spaces between buildings to provide view corridors and reduce visual impacts on the visual quality of the area.

3.7 Colour and Material

A set number of colour schemes and material types are provided for controlling the architectural outcomes. This will allow cohesion throughout the development.

The building materials will follow a pattern of wall types. This will encourage heavier materials (rendered masonry, concrete block, stone) for the base of buildings and lighter materials (fiber-cement sheets, weather-board, metal cladding) for the upper portions of buildings. The third wall type will be used for feature walls and ancillary or landscape walls.

3.8 Built Form Guidelines

All houses will comply with SEDA and BASIX guidelines. Home sites will be integrated into the setting, by extending native planting into the front gardens. This borrowed landscape will extend the sense of scale of the public domain.

In relation to the residential development at Sandy Beach North it is intended to provide a defined level of control over the architectural outcomes and streetscape development. It is proposed that this level of control – applied to the landscaping and civil works as well as the architecture – will create a harmonious and unified development. It is intended that the residential development at Sandy Beach North will become a premier development for the Coffs Harbour region.

3.9 Privacy and Views

The privacy of adjoining dwellings on the southern boundary will be maintained through a large setback (15m) between the houses adjoining the boundary. The setback to be incorporated in the building footprint plans for each lot along the southern boundary.

3.10 Shadow Impact

At no times will there be any shadow impact from dwellings on areas beyond the site , particularly to properties to the south of the site, Hearns lakeor the beach area.along the eastern boundary.

At all times the shadows will be contained within the site, and the design form, lot orientation and building siting will ensure goodsolar access to all dwellings in mid-winter during the day.

3.11 Design Panel

Design panel approval prior to lodgement of development application.

The Design Review Panel will be established to ensure these guidelines are correctly interpreted and enforced. Regular performance reviews will be held to highlight any amendments to the controls that may be necessary.

The strict management of the built form is key to achieving a unified urban structure.

To achieve, monitor and maintain the quality of housing, the project team structure will include a dedicated Design and Siting Coordinator to assist purchasers and builders to navigate the buying, design and building process. Coupled with the design and building requirements, this process will ensure the integrity of the built form is maintained and the project vision is delivered.

A design review panel will be established and meet regularly to ensure the housing form is evolving in accordance with the project vision.
A great variety of designs and use expressions is possible within it.

The controls are intended to produce a consistent image whilst maintaining opportunities for diversity of product and variety in design within each part of the community. This strategy will help to protect the values of property and provide an ability for variation in building concepts within the context of an integrated community. The key purposes of the Panel are to:

- assist purchasers, designers and builders in selecting, designing and building detached dwellings that are well suited to the lot, taking maximum advantage of open space and internal planning,
- produce detached dwellings that create streetscapes which maximise the amenity and attractiveness of the public domain, including streets and parks, and that are not dominated by cars and garages,
- distinguish particular places and frontages where a defined treatment should be incorporated such as along main entry routes, and
- minimise delays in the processing of applications with the relevant authorities.

The Panel will ensure that the dwellings achieve the level of quality expected in these controls rather than merely ‘checking boxes’. Careful attention must be given to fences, gates and security doors, materials, colours, proportions, scale, address and relationship to neighbouring dwellings.

The Panel will operate under the control of the developer until the last allotment or super lot is developed, when control of it will pass over to the community.

Sandy Beach will incorporate housing styles, landscape architecture and urban design solutions that will respond positively to the changing Coffs Harbour market and demographic profile.

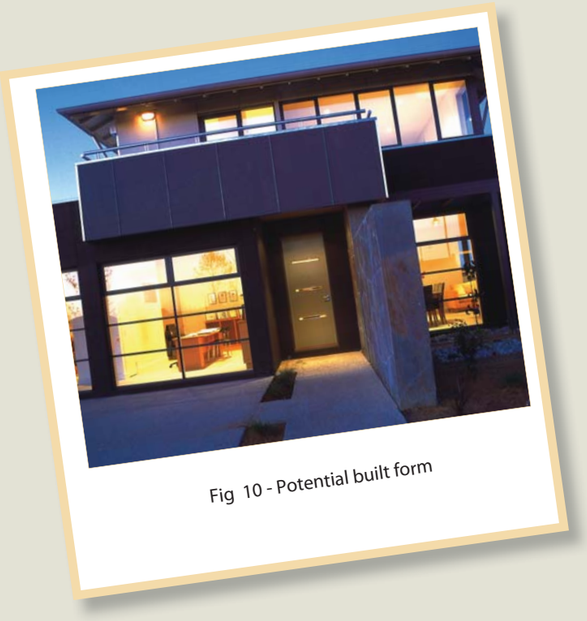


Fig 10 - Potential built form

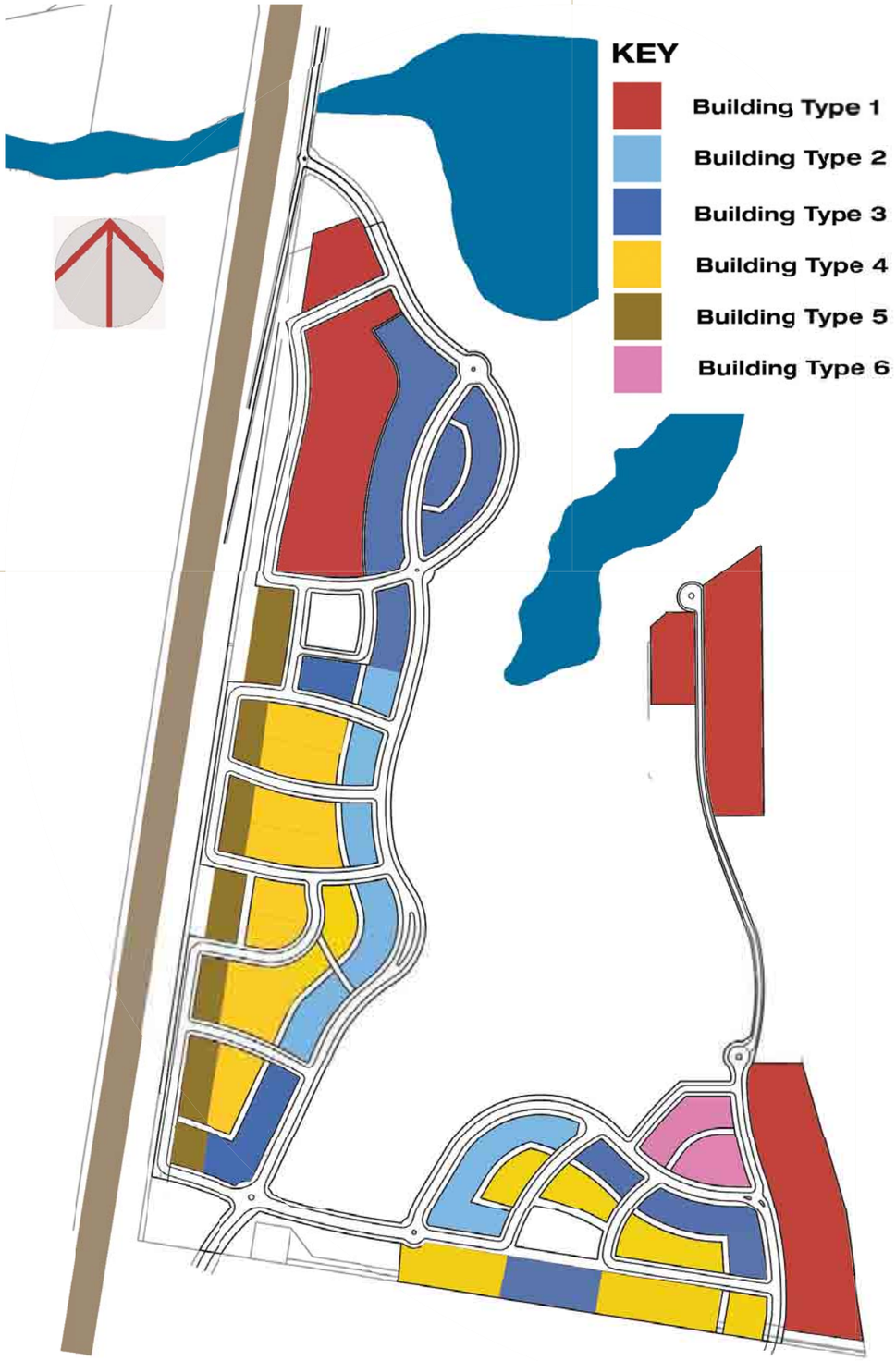


Fig 12 - Building Types

3.12 Architectural Sub-zones and Building Typologies

Key building typologies:

1- Large lot and Beach Subzone – Building Type 1

2 - Edge Subzone / Single Storey – Building Type 2

3 Edge Subzone / Two Storey – Building Type 3

4 - Intermediate Subzone – Building Type 4

5 - Boundary Subzone – Building Type 5

6 - Townhouse SubzoneBuilding Type 6

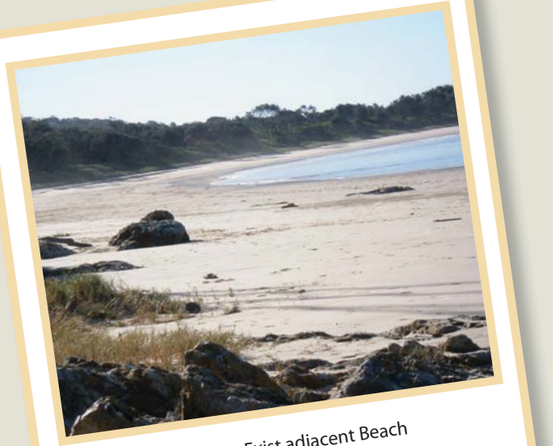
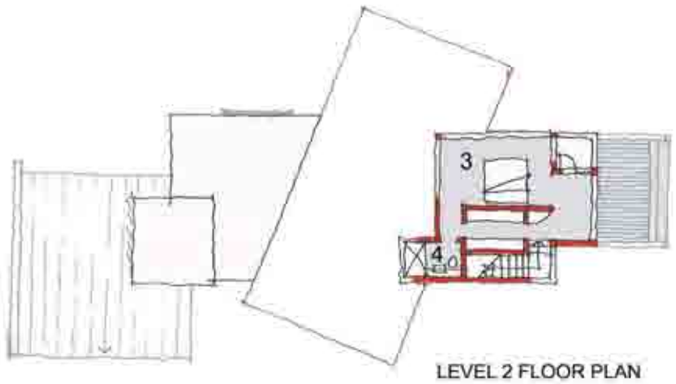
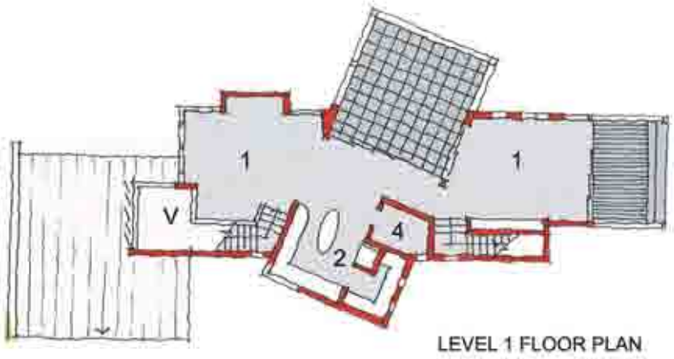


Fig 11 - Exist adjacent Beach

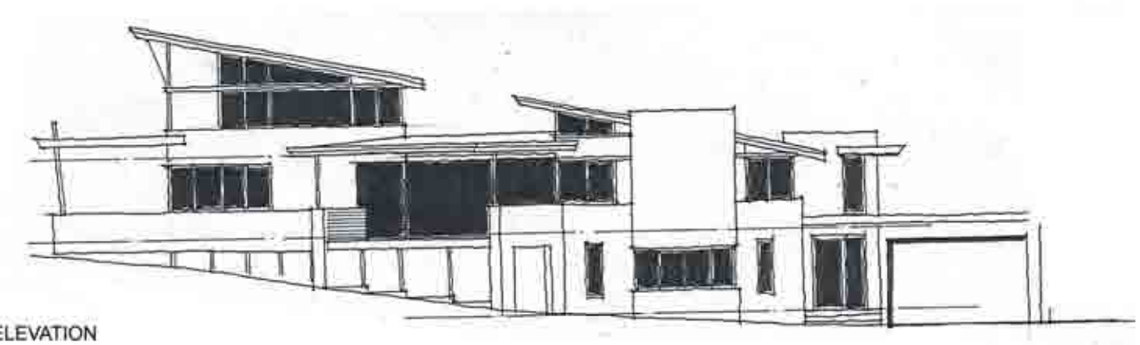
"Sandy Beach North will be a model integrated and sustainable coastal community of the highest quality, sensitive to its location and context and setting the standard for masterplanned communities along the NSW north coast"



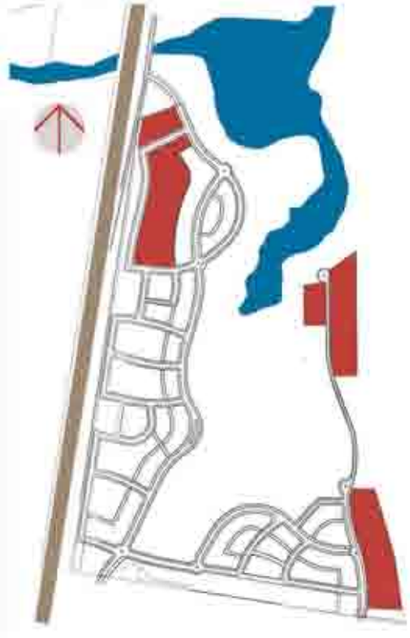
LEVEL 2 FLOOR PLAN

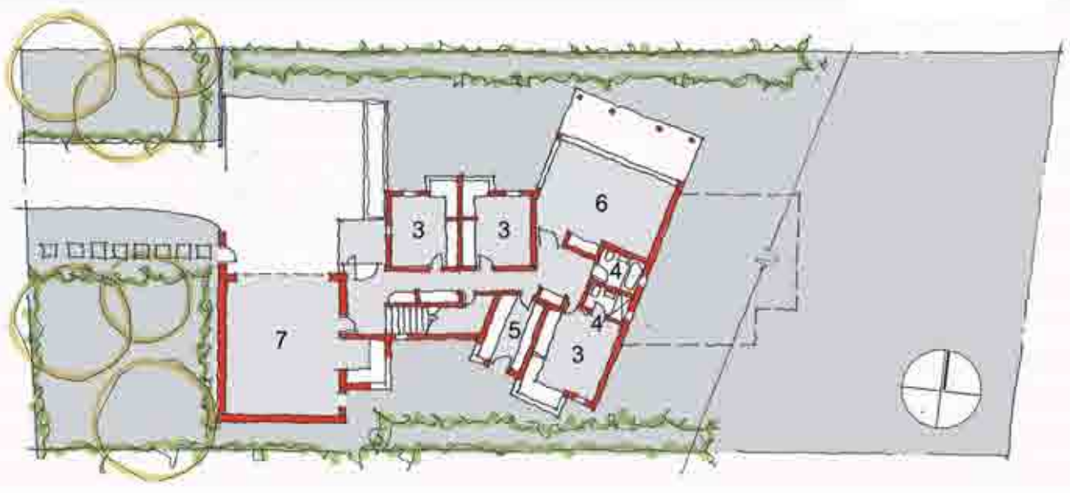


LEVEL 1 FLOOR PLAN



NORTH ELEVATION





GROUND FLOOR PLAN
NOT TO SCALE

LEGEND

1 LIVING/DINING
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 LAUNDRY
6 RUMPUS/STUDY
7 GARAGE

Large Lot and Beach Subzone – Building Type 1

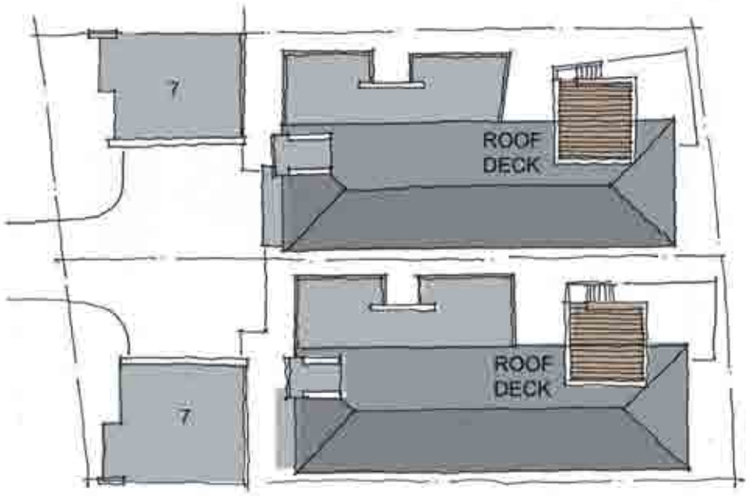
The Large lot sub-zone plays a vital role in the more heavily vegetated portions of the site - with siteing of building set around existing trees to maximise their retention.

The Beach Subzone is identified as the premier lot location, with good views, access to beach, large lot size and private road access. As a result, the controls on this zone in terms of building type, form, height and materials will reflect this sensitive location.
It is also proposed that the building designs for this subzone will be individually created. The proposed building design and elevation treatment is a suggestion only and not a strict template to follow. All building designs for this subzone would need the approval of the Architectural Review Panel.

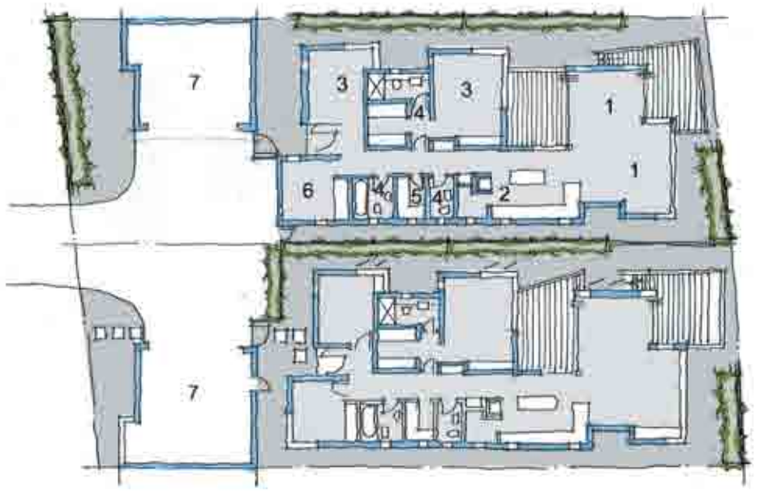
BUILDING TYPE 1

BUILDING TYPOLOGIES
LARGE LOT AND BEACH EDGE ZONE - **BUILDING TYPE 1**

Fig 13 - Building Type 1



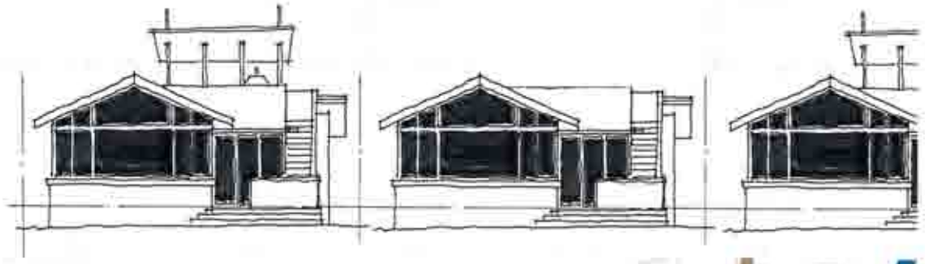
ROOF PLAN



GROUND FLOOR PLAN
NOT TO SCALE

NORTH ELEVATION

TYPICAL STREET ELEVATION



LAKESIDE ELEVATION

LEGEND

1 LIVING/DINING
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 LAUNDRY
6 RUMPUS/STUDY
7 GARAGE

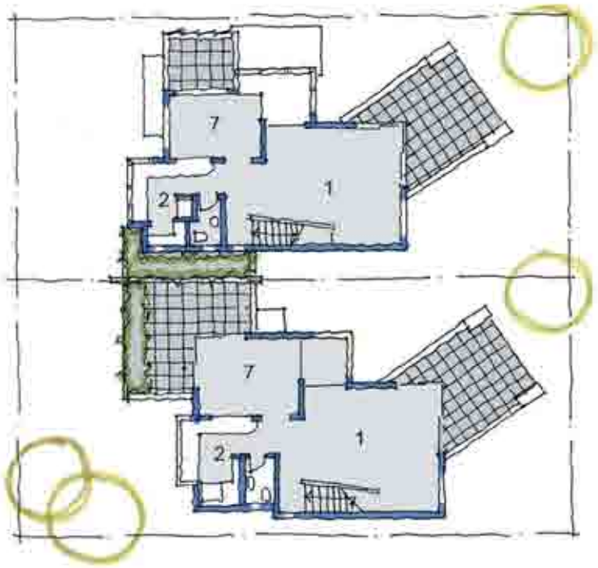
Edge Subzone/Single Storey – Building Type 2

The edge subzone represents the most visible and public lots and the architecture will need to reflect the prominent position. The proposed architecture typologies are intended to be replicated with minor variation of building forms and details. Most of these Subzone lots have garages on only one side of the street. This will create a definitive quality streetscape.

BUILDING TYPE 2

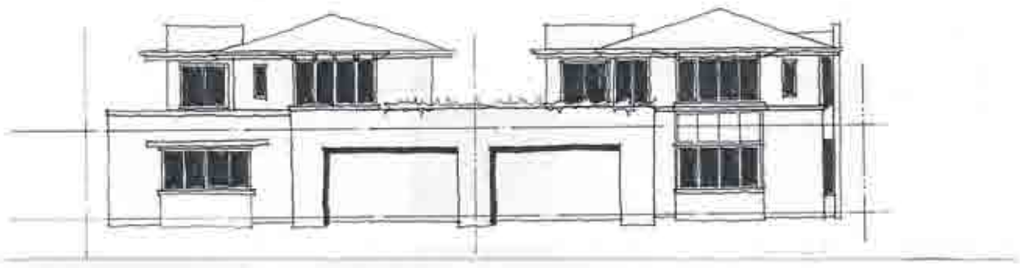
BUILDING TYPOLOGIES
EDGE SUBZONE – **BUILDING TYPE 2**

Fig 14 - Building Type 2



LEVEL 1 FLOOR PLAN

TYPICAL STREET ELEVATION



TYPICAL REAR ELEVATION

GROUND FLOOR PLAN
NOT TO SCALE

LEGEND

1 LIVING/DINING
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 LAUNDRY
6 RUMPUS/STUDY
7 FAMILY
8 GARAGE

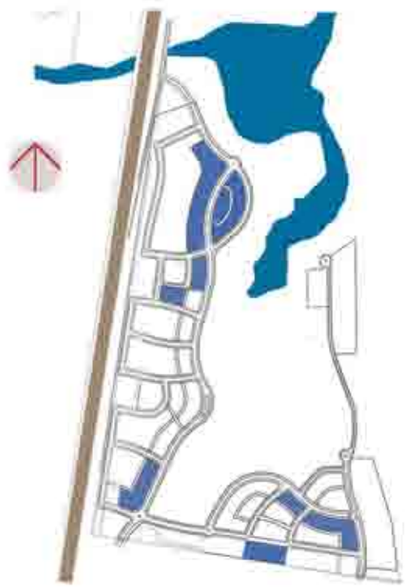
EDGE SUBZONE – ATTACHED

This edge subzone will have similar controls, with the main difference being the allowable number of storeys and the degree of attachment between adjoining residences.

Both Edge Subzones represent the most visible and public lots and the architecture will need to reflect the prominent position.

The proposed architecture typologies are intended to be replicated with minor variation of building forms and details.

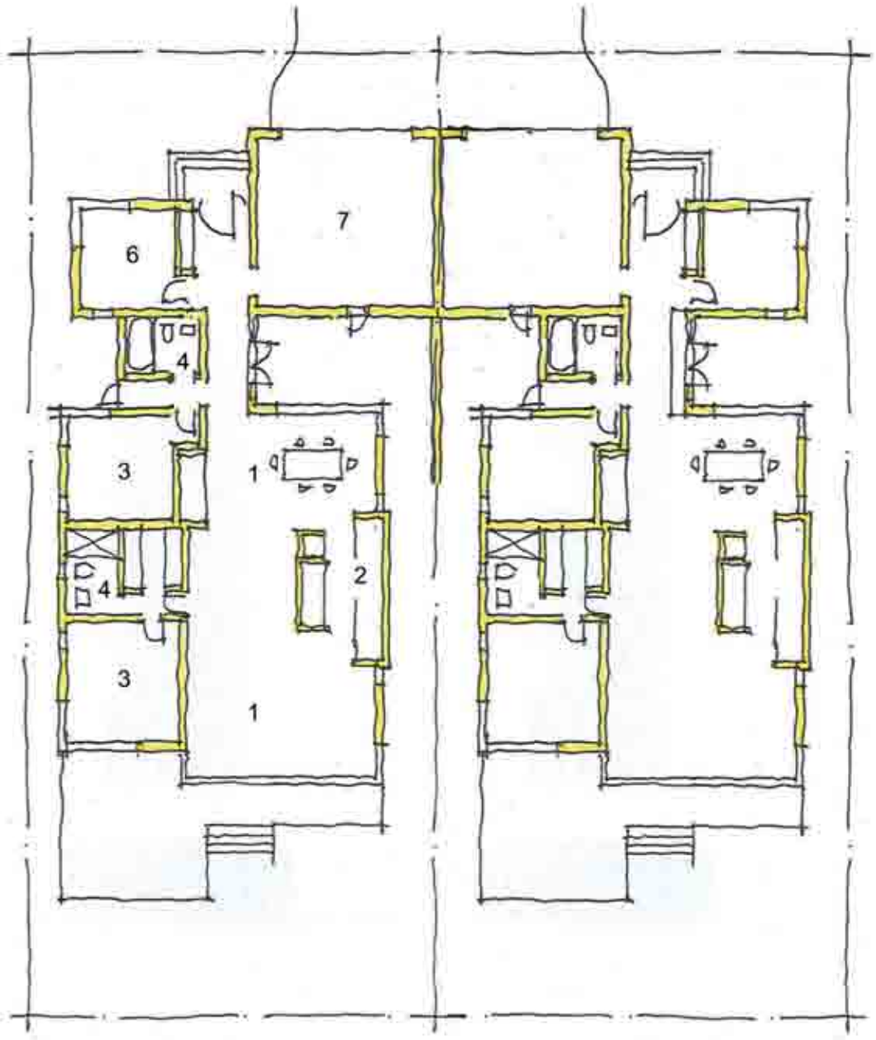
Two of the key features of this subzone include removing garages to rear lane access and having all living areas on the top floor. This will create a definitive quality streetscape.



BUILDING TYPE 3

BUILDING TYPOLOGIES
EDGE SUBZONE – **BUILDING TYPE 3**

Fig 15 - Building Type 3

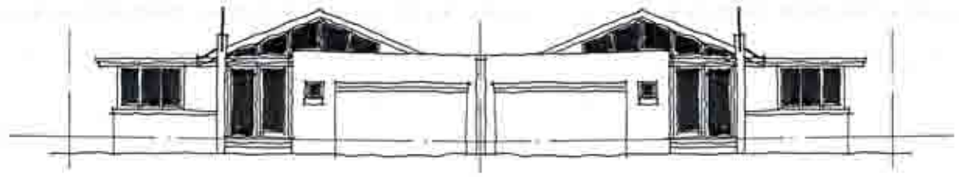


GROUND FLOOR PLAN
SCALE 1:200

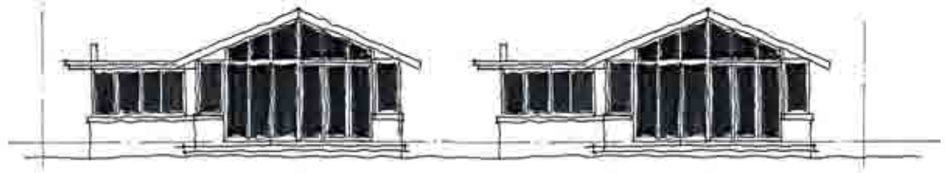
LEGEND

1 LIVING/DINING
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 LAUNDRY
6 RUMPUS/STUDY
7 GARAGE

EAST ELEVATION



STREET ELEVATION

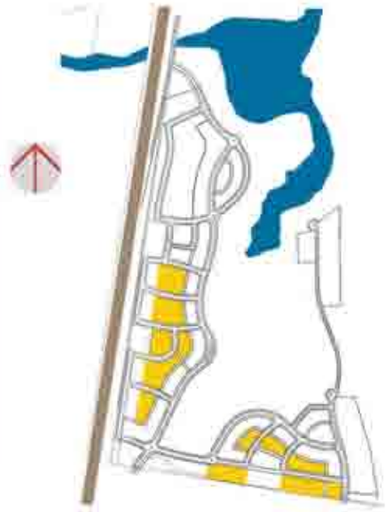


TYPICAL REAR ELEVATION

Intermediate Subzone – Building Type 4

The Intermediate Subzone represents the internalized portions of the individual Precincts.

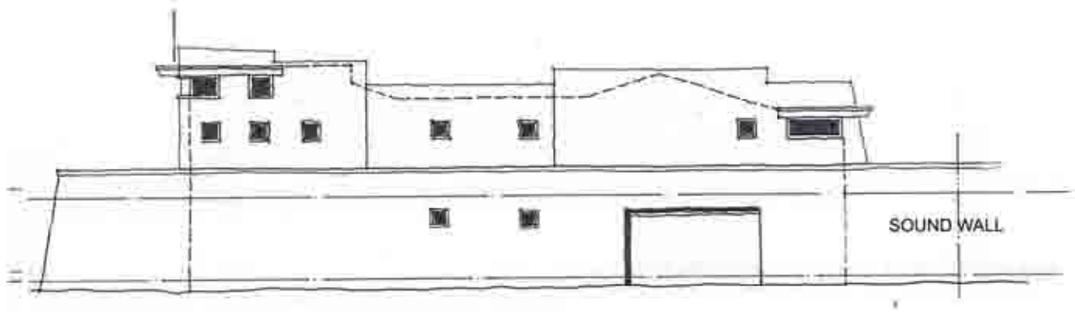
The architectural outcome in this subzone is important, as it address the collector road



BUILDING TYPE 4

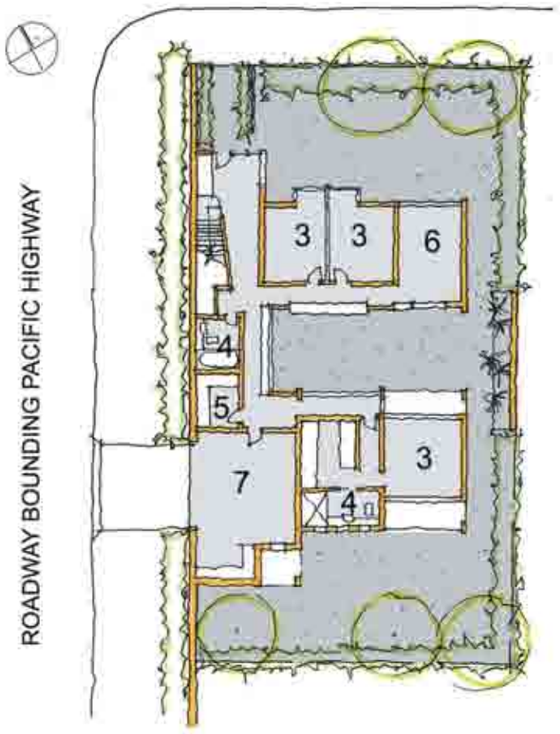
BUILDING TYPOLOGIES
INTERMEDIATE SUBZONE – **BUILDING TYPE 4**

Fig 16 - Building Type 4

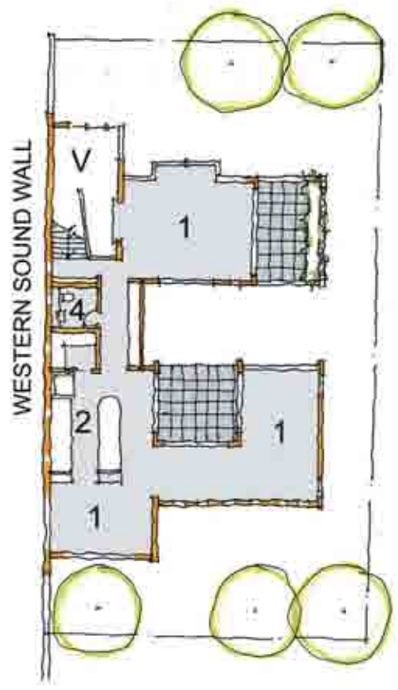


WEST ELEVATION – SOUND WALL

EAST ELEVATION



GROUND FLOOR PLAN
NOT TO SCALE



LEVEL 1 FLOOR PLAN

LEGEND

1 LIVING/DINING
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 LAUNDRY
6 RUMPUS/STUDY
7 GARAGE

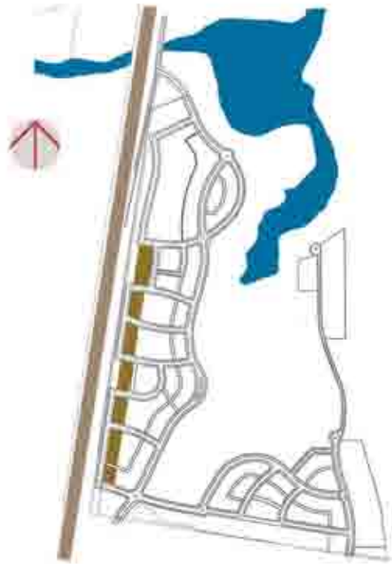
BOUNDARY SUBZONE

The Boundary subzone is created separate as it plays a vital role in the sound attenuation of the Pacific Highway.

The proposed building design is created to form a sound wall to the Western edge, with the house opening up to the East.

The sound wall will included double-glazed fixed windows and heavy materials, culminating in a tall parapet to deflect noise over the development.

This will work in association with the proposed stand-alone sound wall on the site boundary.



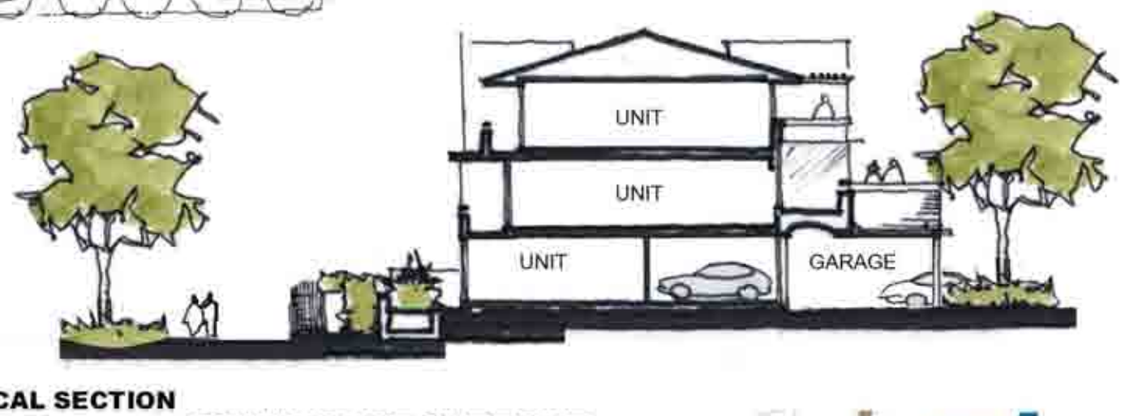
BUILDING TYPE 5

BUILDING TYPOLOGIES
BOUNDARY SUBZONE – **BUILDING TYPE 5**

Fig 17 - Building Type 5

APPROXIMATE UNIT LAYOUT
NOT TO SCALE

TYPICAL BLOCK LAYOUT
NOT TO SCALE



TYPICAL SECTION
NOT TO SCALE

ALTERNATIVE UNIT LAYOUTS
NOT TO SCALE

TOWNHOUSE SUBZONE

There are three proposed areas on the site for an integrated townhouse medium-to-low density development. These buildings will include generous outdoor space and green courtyards and will make the most of the views overlooking the lake. Each unit will be orientated to allow year-round sunlight access and all units achieve excellent cross-ventilation.

Each building will be highly articulated and designed to intergrate with the surrounding low-density housing and will be a maximum of 3 storeys in height.

Garaging will be concealed within the development with rear access.

LEGEND

1 LIVING/DINING
2 KITCHEN
3 BEDROOM
4 BATHROOM
5 LAUNDRY
6 RUMPUS/STUDY
7 GARAGE

BUILDING TYPE 6

BUILDING TYPOLOGIES
TOWNHOUSE SUBZONE – **BUILDING TYPE 6**

Fig 18 - Building Type 6

Fig 19 to 23 - Typical built form

3.13 Neighbourhood Design

The typical neighbourhood comprises flexible layout and open space including:

- special landscape treatments that provide individual character and identity
- connectivity to open space
- ensuring residents have privacy; visually and acoustically
- positioning of buildings to provide passive surveillance
- varity of housing products in terms of size, density and affordability, where each dwelling addresses the street
- each village linked by a legible and permeable road system and pedestrian network
- block patterns that respond to the site topography
- an emphasis on open space
- capturing of views towards Hearns Lake
- orientation of houses that maximises opportunities to provide energy efficient houses that "touch the ground lightly" in accordance with sustainability objectives
- A mix of lot types and sizes throughout the site to maximise housing diversity and introduce affordability and ensure private open space.
- A predominance of blocks that maximise the potential for energy efficient home design and siting.
- An circulation network that ensures all residents have easy access to a bus stop.
- Frontages are activated to permit passive surveillance by residents
- An understandable network for residents, pedestrians and cyclists, visitors, support and emergency services and cars.
- To create a safe, secure, sustainable residential community that delivers housing and lifestyle choice.
- providing residents with a pleasant microclimate with access to daylight and natural ventilation
- the built form to consider the whole streetscape rather than each individual building / house

Fig 24 - Enlargement showing typical lot layout

4.0 Landscape Concept

4.1 Landscape Character

The landscape will be a major defining characteristic of the residential development. The creation of a range of landscape features and elements will establish a unique landscape setting that reflects the coastal location and provides a memorable residential experience.

The site planning has been strongly influenced by the bio-diversity values of the Hearns Lake and coastal environment and the opportunity for its conservation and rehabilitation.

Approximately 50% of the site have been set aside for open space and conservation purposes. The objective is to retain areas that are undisturbed and re vegetate areas that have been disturbed.

The landscape approach will establish a strong landscape framework reflective of the coastal environment and bushland within the site. The existing coastal heath and open woodland is visually symbolic of the coastline landscape. The scattered small coastal settlements, or villages tend to appear nestled amongst this landscape.

The landscape treatments will not be unique and separate from the surrounding area. Nor will it be a facsimile of the existing native vegetation community. The proposed landscape character is a balance between the native coastal heath and open woodland with the demands of a new coastal residential development. The visual character of this development is one of a low-key, visually unobtrusive, quiet coastal town or hamlet nestled amongst the numerous canopy trees and lake edges. The numerous mature trees in the streets and parks provide ample shade encouraging walking along the local roads leading to and across the lake, over the sand dunes and to the beach.

The visual emphasis of the landscape treatment is "bush to the boundary": the road verges and public open spaces support abundant plant life stretching from boundary to boundary and visually 'engulfing' the road and services, giving the sense that the development is carefully nestled in amongst the trees and vegetation suggesting that this 'new' community has been here a long time.

This new development respects and continues this tradition of seeking a balance between the spread of the town and the landscape. Here the streets and parks will have ample trees to provide shade, limit house to house and cross-street views, encourage pedestrian use of the roads and in turn promote passive security and a sense of local ownership.

These well maintained spaces give the sense that 'some one cares', as if community has existed here a long time, has worked with the landscape.

The relaxed nature of the new development is reinforced with the presence of the village green offering managed grassland, picnic opportunities, informal gathering space in amongst the shade of retained trees, the pocket parks and landscaped streets encouraging pedestrian movement and use, and the way the landscape softens the traditionally visually dominate driveways and garages façade of each lot.

Fundamental to the development of Sandy Beach is the landscape setting. Retention of remnant vegetation will be a priority and upgraded. New plantings will replace vegetation lost and supplement existing vegetation retained. Where vegetation exists opportunities will be explored for larger lots with bigger gardens to retain trees, particularly along the eastern

Verges will be widened within the street to include the water sensitive urban design requirements. These will appear be fully landscaped areas and will provide additional visual amenity for the residents.

A continuous canopy of trees on the local streets and a ground layer of endemic, ephemeral wetland species and ground cover plants will create a layered effect, which combined with vegetated swales will enhance local biodiversity.

Planting will play a significant role in establishing a distinctive residential environment with coastal ambience.

The landscape strategy is intended to improve community / urban sustainability by ensuring the provision of 'quality of life' benefits for the existing and future residents and local community.

A principal objective is to protect and preserve local vegetation associations and habitat by linking them into open space and catchment systems.

4.2 Landscape Principles

Key attributes of the landscape design for this proposal will include:

- maximising entrance to the site that captures its essential qualities or sense of place,
- an innovative water management scheme that counterpoints constructed and 'natural' waterways; expresses the site's water management strategy, offers ornamental value and modifies microclimate,
- an open space network will connect to the lake and beach and provide an exciting recreational experience and vivid natural backdrop,
- retaining natural creek lines,
- reforming natural creek lines currently contained by concrete lining,
- retaining and management of riparian edge,
- retaining back of sand dune, managing and limiting development,
- roads to be shared vehicle/pedestrian,
- landscape treatment at each side of the road verge to screen housing, creating sense of coastal heath and open woodland,
- development will be separated from riparian zone by road and with 2.5m wide path,
- landscape strip between path and lot, and
- fencing at riparian edge to be open and unobtrusive i.e. timber post and rail or two stands of wire and no rail.

The landscape treatment of the boundaries is crucial to the integrity of the development with the wider community – functionally, socially and aesthetically. Sandy Beach North is not an introspective, fenced or 'gated' community, natural boundaries and stands of native vegetation are retained and reinforced throughout the site.

Fig 25 to 52 - Potential landscape treatment

Fig 28 to 29 - Potential streetscape treatments

Fig 30 - Birds eye view view nort east of proposed residential development

4.3 Landscape Concept Plan

Key

1. Collector roads, sympathetic to lake form, with wide verges to include WSUD requirements combined with extensive street tree planting
2. Entry roads from Sandy Beach
3. Rear lane access
4. Protection of riparian zone with landscape buffer and edge roads
5. Protected stands of remnant trees
6. Protected coastal dune
7. Noise attentuation to highway
8. Long term access from future Woolgoolga interchange
9. Pocket parks
10. Controlled access to beach
11. Realigned and rehabilitated drainage line
12. Shared path adjacent the edge road

Fig 31 - Landscape Concept Plan

4.4 Public Realm and Open Space Network

4.4.1 Responsiveness to needs

The public realm is defined by the physical and planning characteristics of the site: creek lines, riparian edges, stands of trees, landform, sand dunes and built form. Equally, the set back boundaries, view opportunities, distance from highway, distance from beach and location of entry points also determine the character of the open space.

The sequencing of the open space and public realm is planned to lead one through the development, pivoted around Hearns Lake.

4.4.2 Accessibility

The development will offer a variety of landscape treatments and areas of public domain, sympathetic to the natural environment and project architecture. The open space network will be easily accessible and clearly visible, overlooked by roads and housing, increasing the sense of safety. Pathways will provide pedestrian connections between local streets.

The concept plan responds to the needs of pedestrians and cyclists by creating a legible, direct, and safe set of connections to all facilities and the surrounding community. A series of pedestrian/cycle link routes allow residents to permeate through the site to the beach.

Residents with special needs will be catered for through reduced gradients, level entry and priority parking where appropriate.

4.4.3 Community

The open space to provide opportunity for a variety of facilities and are of practical dimensions to achieve the recreational / landscape role intended, catering for family use (playgrounds, kickabout with support facilities shaded seating, and some parking)

Playgrounds will be designed playspaces, utilising a combination of standard 'offthe- shelf' equipment and landscape feature elements that will assist in integrating the space with the surrounding parklands. Playspaces will cater for all age groups.

In addition the open space will cater for personal fitness (walking cycling jogging, exercise)

4.4.4 Cultural References and Theming

The open space network will be designed to provide a distinct character for the development. Artists may be engaged and coordinated by an artwork facilitator to provide input to the character of all structures, furniture, signage, lighting and paving. The incorporation of themed art recognises the natural attributes, culture and heritage of the region. This will be developed around a series of story sites connected through the pedestrian, and cycle network, visually linked to each other through architectural design and artwork.

Art will be educational, accessible and durable. An iconic artwork or architectural feature repeated throughout will link these sites and assist to develop sense of place and identity.

The design of open spaces will reflect the different locations, their functions and relationship to local community.

4.4.5 Maintenance

Detailed maintenance regimes will be assessed and landscape designs developed to ensure that intricate turf areas are minimised and native revegetation is incorporated to reduce ongoing maintenance regimes. Irrigation of the public open space system will be minimised.

All planted areas will be fully mulched and planted with native groundcover vegetation to minimise evaporation. The irrigation system will be an above ground drip system with soil moisture detection devices for water conservation.

There will be a variety of street trees throughout the residential precinct, which will be consistent with the environmental values of the site. Street trees will be sustainable and tolerant of low/reduced water supply.

The community education program will also promote water conservation throughout the open space network as a demonstration project.
The landscape and open space areas will maintained based on a routine maintenance program with a log kept of all maintenance activities. Key components of the management and maintenance of environmental areas includes:

- establishment and management the minimum riparian and both zones between the developemnt edge and conservation areas offsets with weed removal and revegetation management strategies implemented for each of these areas.
- All open space and conservation areas will have edge roads, providing a clear delineation between the built area and open space/conservation areas
- fencing (combined with information signage) to minimise edge effects created by the development adjoining the conservation areas, enabling both regeneration and to control access. The fencing regime will allow revegetation of degraded, sensitive and eroded areas. This fencing can be temporary in some areas to allow vegetation to establish.
- control and removal of weeds, using environmentally acceptable methods
- revegetation using plants propagated from locally sourced seed and educational awareness, with arrangements made with local greening groups
- education prorams, including presentation, signage and periodic information issued via brochures and/or website
- Dead trees in open space areas should be retained where safely possible to create hollows and habitat for bird life, possums, bats and other fauna.

4.4.6 Public Domain

Street and park furniture will be of high quality materials, focussed on durability, robustness, and maintenance.

4.4.7 Safety and Security

All open space areas are located to maximise passive surveillance by the residents from living areas looking onto the streets, shareways and open space with careful design considerations within the landscape to balance privacy within the private domain to increase interaction between the private and public domain.

Safety and security both real and perceived, are important elements in creating a new urban community. The concept plan reflects best practice for providing safe and secure public spaces with high levels of passive surveillance and interaction and incorporates Crime Prevention Through Environmental Design (CPTED) principles.

Specific measures include:

- Passive surveillance of open space that are well-lit area;
- Provision of an interesting, active and connected open space system that will increase participation levels;
- A strong frontage to the open space system from all residential precincts that enables extensive casual surveillance over the open space. This is reinforced through areas of higher density development adjoining the open space system;
- Low groundcover planting directly adjacent to pathways and path intersections to improve cross surveillance;
- Major cycle, and pedestrian links illuminated by a public lighting system;
- Areas under bridge structures and boardwalks that are designed to increase visibility to those areas.

4.4.8 Landscape Areas

Hearns lake/Riparian Zone/Coastal Zone

Riparian/Conservation Areas and Environmental protection:

- fence for pedestrian control
- under planted with new planting,
- weed eradication and management program implemented,
- development edge defined by path/road edge,
- unobtrusive fencing – timber post and rail or two strand wire,

Sand dune:

- fence for pedestrian control, allows fauna movement,
- under planted with new planting,
- weed eradication and management program implemented,
- development edge defined by informal fence.

Public Open Space

Road Verges

- vegetated swales,
- dense landscape treatment, road and paths visually subdued.

Parks, Active Spaces:

- managed grassed area, scattered canopy trees,
- irrigated (grey water),
- views from the road and the park over riparian zone to lake and woodland at the back of the sand dunes,
- furniture – seating, shelter, informal picnicking
- recreation/open space at the lake edge between collector road and riparian zone,
- dominant landscape character is the retained trees and managed grass parkland,
- provides for informal recreation, informal gathering,
- inclusion of play equipment sized to best fit character space and noise impact on neighboring housing,
- low level pedestrian lighting only, no glare to neighbouring housing,
- multiple pedestrian entry points, one maintenance/emergency access point.

Green Open Space

- Existing creek lines retained and enhanced,
- new planting of riparian planting,
- new vegetation to screen views from lot to lot,

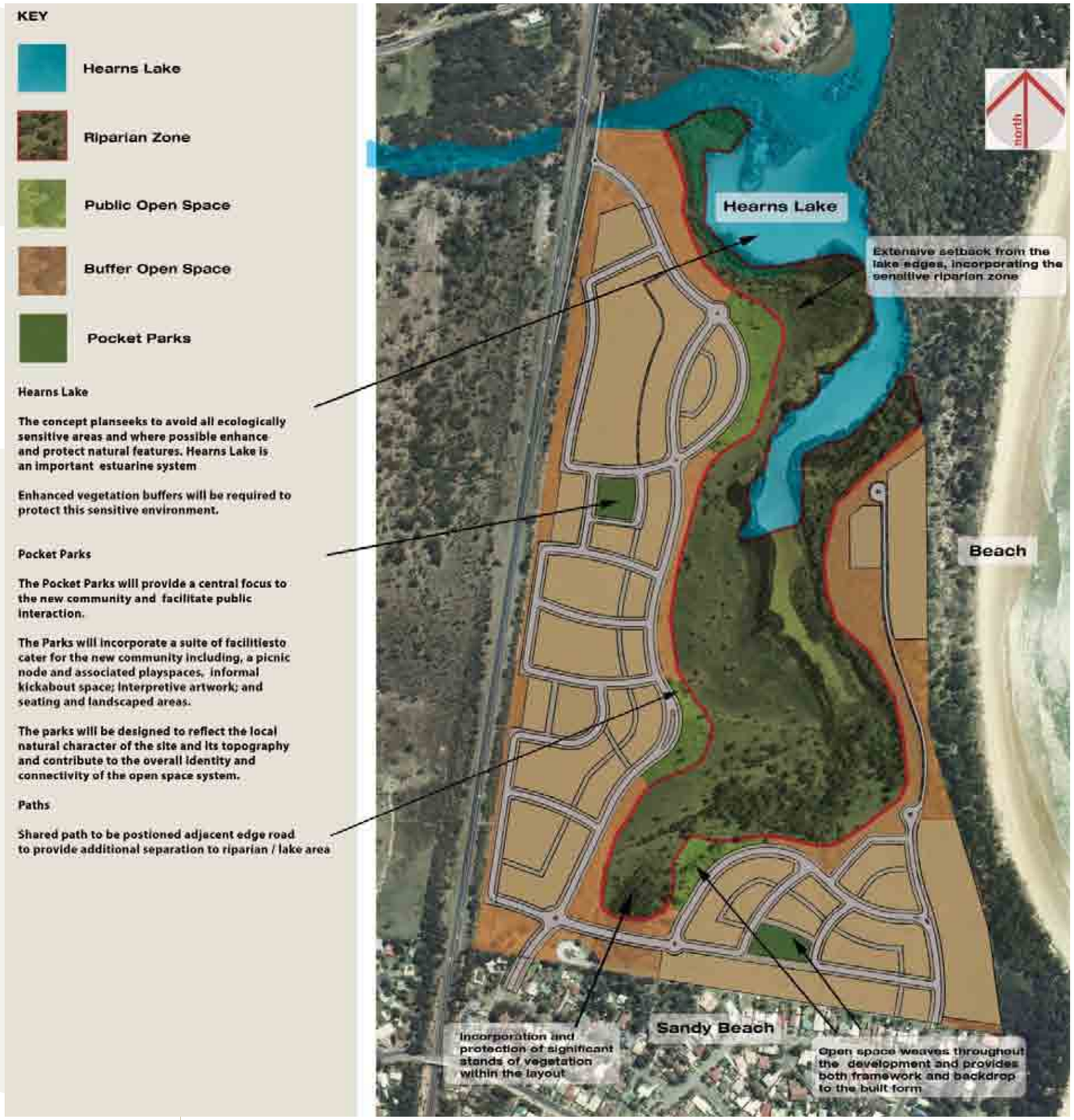


Fig 32 - Open space network

4.5 Flora and Fauna

The landscaping scheme of the development will aim to protect, enhance and expand core vegetation communities, improve local amenity and seek to reintroduce habitat in a number of ways :

- Through the re-establishment of endemic communities in the designated riparian corridor,
- Through the integration of water management strategies which permeate the site,
- The rain garden laneways, the bioretention street corridors, and the ornamental wetlands, which will be planted with endemic macrophytic species. There will be minimal import and export of soil to the site, since the makeup of the soil and the habitat it provides has developed to be specific to site conditions.

Site specific measures will be developed to ameliorate the effects of development within the site as a result of the proposed development. These will include the retention and protection of aquatic habitats and associated vegetation, retention and maintenance of reserve areas, retention of hollow trees and identification of use by fauna, protection of some areas of Wallum Froglet habitat, provision of compensatory habitat and vegetation management strategies.

The development proposes the retention of vegetation and habitats as part of Open Space and drainage reserve areas. A buffer of variable width will be retained around the shore of Hearns Lake protecting the ecological values within the lake.

Vegetation and habitats will also be retained within Open Space areas in the north-east of the site and control and southeast portions of the site.

We note however the value of the site as providing a corridor to other sites is limited due to its isolation from similar habitats to the west of the Pacific Highway as noted with Conacher Travers Ecological Survey and Assessment.

The retention and protection of Hearns Lake and its shoreline areas along with the retention of other bushland and drainage areas within the site will continue to provide habitats for locally occurring flora and fauna species.

Fig 33 - Wallum Froglet

In particular Wallum Froglet habitat will be retained through the provision of connecting open space areas linking areas of Wallum Heath in the south-west of the site to similar habitat areas on the western edge of Hearns Lake.

The approach adopted seeks to avoid all ecologically sensitive areas and where possible enhance and protect natural features. Hearns Lake is an important estuarine system Enhanced vegetation buffers will be required to protect this sensitive environment.

As previously stated the site is largely cleared of vegetation so there is an opportunity to develop a residential estate with little clearing of native vegetation. The principles to be observed in the creation of open space areas are as follows:

The design has all perimeter roads separating all residential areas from proposed open space and environmental protection areas. These perimeter roads will also assist in the creation of asset protection zones (APZ) to provide protection from the threat of bushfire.

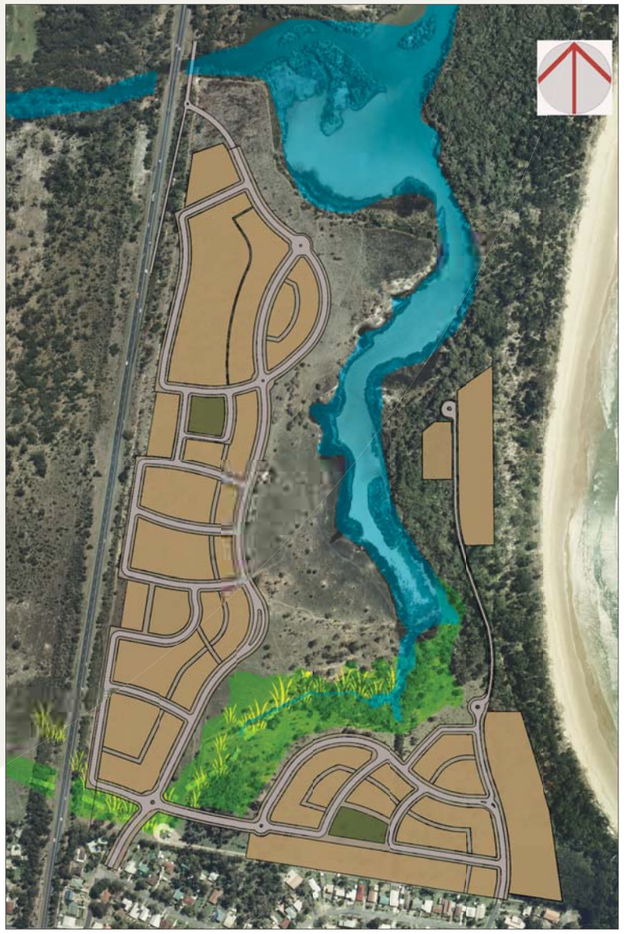


Fig 34 - Proposed riparian corridor for Wallum Froglet

To recapture the essence of the original vegetation community with trees and understorey plants indigenous to the site planted from the outset. and a significant revegetation program, with multiple benefits of increased tree cover, management of water table, creation of habitat and enhancing of local ecosystems

To respect the sites ecological limits, preserving and enhancing the special qualities of the site, particulary Hearnes Lake and remnant vegetation.

4.6 Tree Retention

The landscape proposal seeks to maximise the retention of suitable trees species where viable, particularly along the boundaries (road, site) where level changes will be minimised.

The design process will utilise the tree survey information as part of the detailed design process.

All trees within the riparian zone will be protected.

Within the individual lots, particularly the larger lots careful siting of the built form will endeavour to minimise tree removal.

Our vision is to restore and enhance natural environmental quality within the ICOL, reinforced throughout the streets and parks, using endemic seed sourced from local provenance, complemented by selective native and exotic species.

KEY - Tree Retention

- **Hearns Lake - all vegetation to be protected**
- **Riparian Zone - all vegetation to be protected**
- **Edge Open Space - tree removal to be minimised subject to earthworks and location of noise wall**
- **Residential areas - selective tree removal to enable road construction, earthwork and house siting / construction**

Fig 35 - Tree Retention

4.7 Accessibility

4.7.1 Circulation

The four precincts are connected by the main sweeping community boulevard (collector road) which follows the profile of the lake and provides access to all local roads.

The boulevard weaves through the development, alternating between openness and enclosure with excellent views to the lake landscape beyond. This design approach is intended to provide a strong sense of arrival to community through a structured landscape.

Access into the site is also proposed from the south at two access points via the existing Sandy Beach suburb. Connectivity will be achieved both through the street geometry and generous public open space. All streets are open to vehicle traffic, yet they are also configured to serve and encourage those who wish to walk or cycle.

The long term access via the interchange will provide residents of the proposed development as well as the existing Sandy Beach suburb with significantly improved access to both the north and south.

A dynamic interaction will be created between the built and natural environments with streets orientated to provide views of the lake supported by generously vegetated road verges and pedestrian linkages.

The internal road system has been designed to achieve the following objectives:

- Safe attractive streets;
- Permeability for cars, pedestrians, and cyclists
- Legibility for residents, visitors, support services (eg postal and refuse collection) and emergency services; and
- The road system that shares traffic loads to preserve residential amenity.

The hierarchy of roads, streets and paths, taken collectively constitute the overall circulation system for site and accommodate vehicular and pedestrian traffic into and throughout the development.

The road hierarchy that responds to the topography of the site, is readily legible and provides high levels of connectivity both internally and to the wider community.

The provision of shared driveways at rear of lots reduces the effect of streets dominated by garages and allows for the development of a continuous canopy of vegetation as a way of encouraging biodiversity and a modified corridor effect through the site. It is intended that "all carriageway and footpath widths and configurations will be designed to Council's current engineering standards".

Residential Streets will be designed to allow a free flow of traffic at low speeds with built-in speed controls used to regulate traffic flows. These streets will incorporate on-street parking and traffic calming features where appropriate.

Landscaping for Residential Streets will be semi-formal in character and designed to enhance the legibility of these streets within the greater street hierarchy; they will, in time, become well-shaded corridors serving the neighbourhoods of the community.

The circulation pattern is based on a number of principles:

- takes advantage of view corridors, with road reserves wide enough to maintain important vistas to the lake and open space,
- provides permeability and cross connectivity throughout the precincts,
- provides a permeable street pattern established that optimises stormwater management while enhancing pedestrian connectivity and reinforcing the integration of environment and community,
- gives a clear, legible and convenient system of streets and pedestrian pathways optimise connectivity, conducive to pedestrian use,
- accommodates through bicycle traffic on street and pedestrian paths throughout the site with opportunities to extend pathways into the open space network,
- the block sizes and orientation will allow for garages to be located either at the front of lots or form shared driveways for rear access,
- open spaces are bordered by edge roads,
- provides good lighting along all footpaths and streets and where possible uses shared lighting without causing interference with adjacent housing,
- ensures low vehicle speeds with a maximum street length of 350m and by offsetting road intersections where feasible so that they are perceived to be shorter,
- all streets will have direct access to and views of open space, with clear connections to walking trails and beach.
- Access Road System – The verges are planted with native groundcovers, grasses and canopy trees at a density that compliments the architectural guidelines reducing visual intrusion of individual lot frontages from one side of the road to the other without creating visually un-safe areas
- Pedestrian Link Lanes – These short shared traffic and pedestrian lanes are interrupted with bollards and low shrub and tree planting that permits and encourages an alternative pedestrian access opportunity through the blocks connecting with the access road and path system.
- The surrounds to the street trees will be a combination of turf and garden areas. These garden areas will feature dense, lush foliage planting to contribute to creating a 'green' setting for the buildings and to create a sense of the buildings being revealed along the route.

4.7.2 Parking

It can be seen that the new development will require parking for the residents but that it can be contained within the site. As per Council design requirements, there will be garage requirements for the future development as well as driveway requirements etc. It is considered that all future parking for the development can be contained on site and that there is no further requirement to review parking for the development.

4.7.3 Site Access

Access will be provided via a number of connections to existing residential roads. During the initial stages of the development, there will be two access points along the southern boundary that will connect with Pine Crescent and Ti-Tree Road. A future third access will be provided at the northern edge of the site that will connect with the future road upgrade of the Pacific Highway. The timing of this third access point will be dependent upon the timing of the Pacific Highway upgrade.These propsed upgrades will enable the site to take full advantage of these linkages

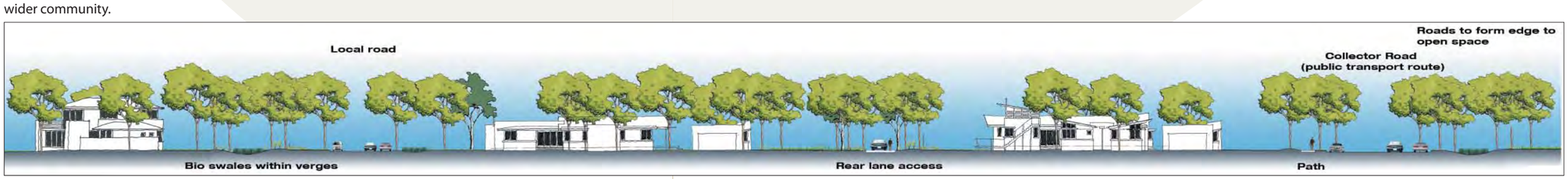


Fig 36 - Typical cross section

4.7.4 Public Transport Connections

The development has the potential to increase public transport demand. The design of the main spine road will allow for the movement of future buses. By providing two access points along the southern boundary, a bus will be able to circulate through the site during the initial stages.

The collector roads will also serve for public transport with bus stops located at strategic locations. The design of the main spine road will allow for the movement of future buses.

It can be seen that the proposed development will have a minimal impact in terms of public transport demand and no additional facilities or routes will be required as part of this development. There could be increased demand for the school bus run and the layout of the site has catered for bus use, with the main north-south spine road designed to cater for bus movements. During the initial stages of the development, buses will be able to proceed through the site via a one-way circulation, entering for example via Ti-Tree Road then exiting via Pine Crescent (or vice versa). The extent of modifications (if any) to the bus services to Sandy Beach will need to be determined at construction stage and will require discussion with the bus company. During the initial stages, it is considered that the school bus service would not need to be altered from the existing route, as the initial stages will be within 400 metres of the existing school bus run along Diamond Head Drive.

4.7.5 Pacific Highway

The Pacific Highway is the main road through the general locality of the region. The Pacific Highway provides a vital link along the east coast of Australia and provides a link between Grafton and beyond to the north and Coffs Harbour and beyond to the south.

The major road network change is the proposed upgrade to the Pacific Highway. The RTA have determined a number of options for upgrading the Pacific Highway in this location and the preferred option is to upgrade along the current alignment to provide two lanes in each direction.

There will be a central median provided along the length of the upgrade to stop right turn movements except at key locations. This option will provide a grade separated intersection to the immediate north of the subject site that will provide a connection to Grahams Drive (north) and Hearnes Lake. There will be an overpass for local traffic movement and slip ramps, allowing for all turning movements at this location.

An initial assessment has been completed with regard to the proposed future site access to the on-ramp to the Pacific Highway at the northern edge of the site. An initial assessment for this access indicates that a 3-way roundabout controlled intersection could be provided on this ramp that would allow for two-way movements on this ramp between the roundabout and Hearnes Lake Drive to the north. Traffic would remain one-way southbound from this roundabout on the slip to merge with southbound movements on the Pacific Highway.

Fig 37 - Long term access via proposed Woolgoolga interchange as part of upgrade to Pacific Highway

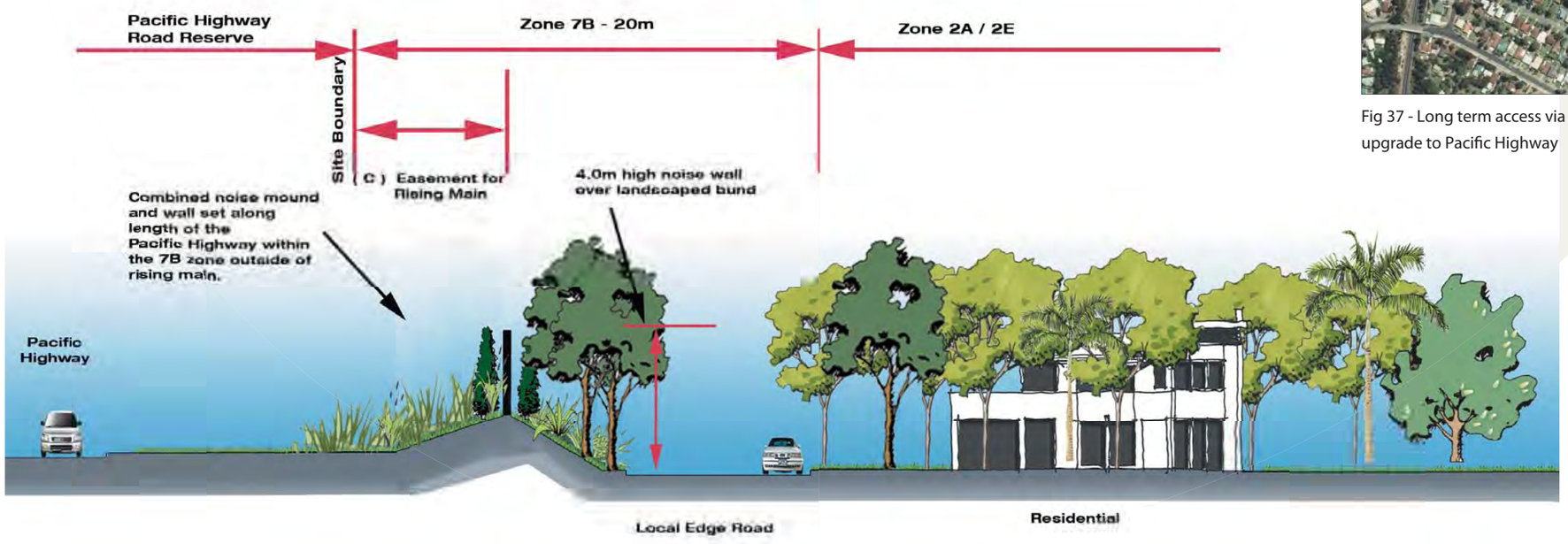


Figure 38 – Propsed combined mound and noise wall to Pacific Highway + identification of easements and boundaries

4.7.6 Road types

The road network provides a simple framework of local roads which shortens movements within the development and provide direct access to adjacent facilities and access points. The suite of roads included have been designed to create a series of residential precincts with a private road atmosphere, generating a sense of place and security, creating a compatible relationship between street and house.

In addition the generous verges will ensure a green theme, providing opportunity for soft engineering and extensive streetscape planting whilst providing footpaths for pedestrian access. The green streets will supplement the network of landscape links creating a continuous network of vegetation between houses, open space and the environmental areas of Hearns Lake and the Beachfront.

Where possible, services will be located immediately adjacent to the kerb or property boundary with shared trenches set within wide verges enabling extensive streetscape planting. The roads will be designed to provide safe environments particularly for children, families and elderly or mobility impaired. A bushfire trail is proposed along the eastern boundary to provide adequate egress to the northern beach precinct.

There will be a network of internal roads that will provide access to the individual residential lots. As well, a network of footpaths and cycleways will provide access through the site and connections between the adjacent existing residential roads within Sandy Beach and access to the beach and Hearnes Lake.

4.7.7 Street Design Standards

The internal road layout will be designed in accordance with Council residential subdivision code taking into account intersection controls, pedestrian requirements as well as road geometry requirements such as carriageway width etc. The road design will also cater for the movement of service vehicles such as refuse collection vehicles, buses and removal trucks, etc. , and will allow for two way traffic movements.

All roads and intersections must be able to accommodate swept path movements associated with a large rigid vehicle such as a Council refuse collection truck or a removalist van.

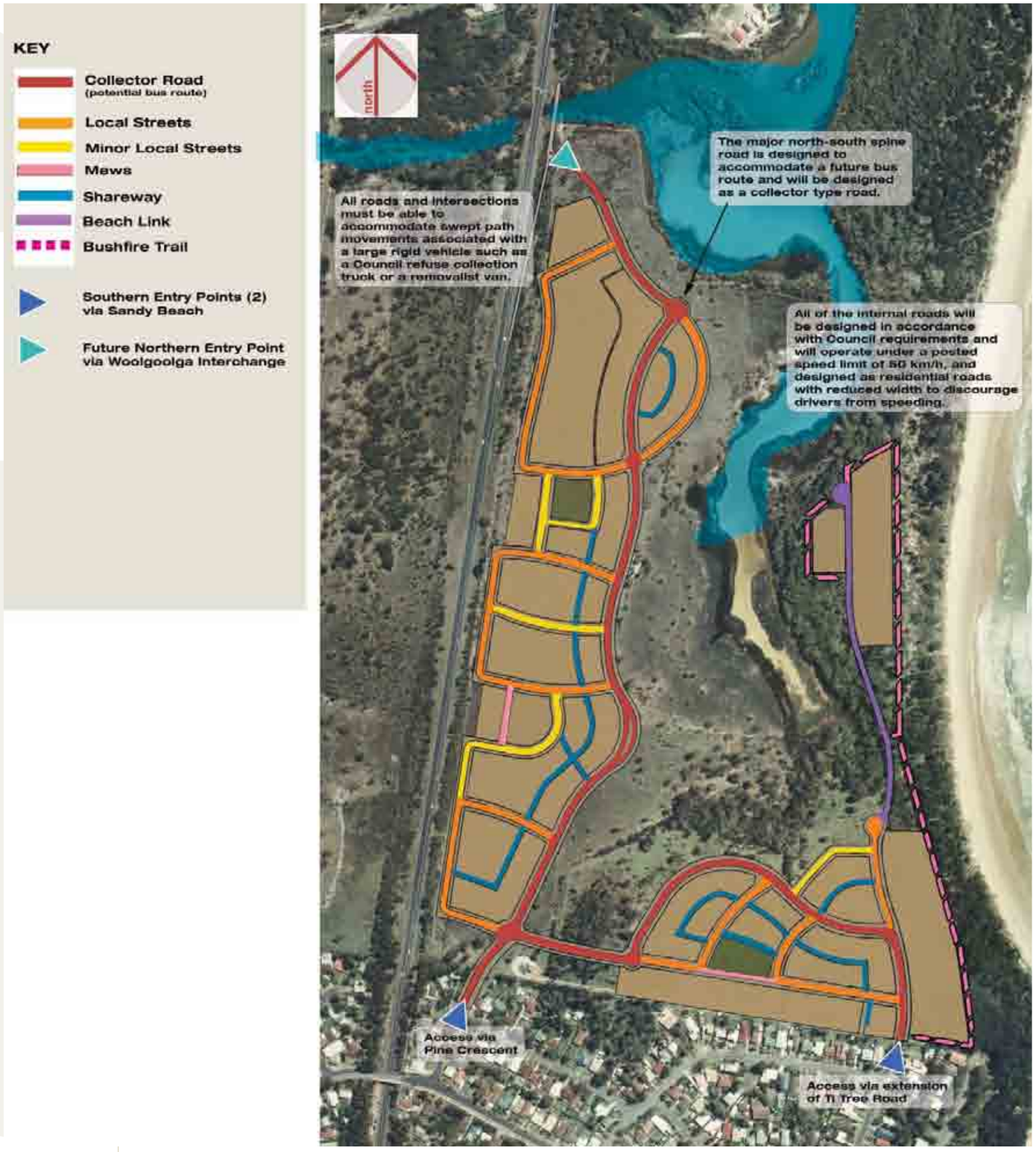


Fig 39 - Road network

4.7.8 Pedestrian and Cycle Connections

Encouraging a healthy community is considered to be a significant sustainability objective in planning for Sandy Beach North. The existing pathway network in Sandy Beach is minimal. It is considered that this situation is totally contrary to the guiding principles that the Applicant has espoused to underpin the proposed development. The situation offers little encouragement for safe, convenient and enjoyable walking for leisure, exercise, community building and other purposes. The plan for Sandy Beach North includes proposed improvements to pathway connections to the existing residential area with controlled access to the beach and to tie in with the Council's Community Programs in regard to healthy living and recreation.

A network of pedestrian and cycleway recreation and exercise 'loops' or circuits with various lengths and gradients are proposed. They are to be designed to encourage use by every age group, and to provide the widest variety of sensual and physical experiences, linking all the main natural and built features.

Regular footpaths are to be provided on at least one side of every street, and on both sides closer to the village centre. Wherever practical cycleway-pedestrian ways will be combined and constructed to Ausroad guidelines. Other than where designated, cyclists will share the carriageway on low traffic local access streets.

Verges will be widened within the street to include the water sensitive urban design requirements. These will appear be fully landscaped areas and will provide additional visual amenity for the residents. boundary along the beach front.

Pedestrian access to the site would be via existing facilities along the adjacent road network. As part of the development, footpaths will be provided along the new residential roads in accordance with Council design requirements. There will also be a system of combined footways/cycleways around the site that will allow for internal movements. These new internal paths will connect with the existing roads in the locality as well as provide a connection to the beach side.

Pedestrian Networks

Pedestrian access through the site can be catered for via a combination of footways adjacent to the roads and off road footway/cycle ways. Some minor roads may not require adjacent footpaths. Linkages will be required between the new development and the beach front, via the proposed beach access as well as to the existing residential area to the south.

Cycle Networks

In relation to Cyclists, they will be catered for with their safety being a key consideration in the design.

The design of the traffic/pedestrian thoroughfares is intended to provide the community with a connected set of roads, footpaths and open space linkages which importantly brings the open space, lake and beach fronts closer to every home, yet ensure there is no unnecessary access to the ecologically sensitive areas to which access has been restricted/ minimised.

The pathway along the main vehicular link will culminate in the beach link, located between the two bulks of the Beachfront lots. A raised boardwalk will link the pathway across the dunes to the beach access.

The pedestrian realm will be designed to facilitate the linking function Residential Streets with connecting neighbourhood parks with each other and to the village heart.

Well-lit pedestrian paths, which will be wide enough to provide some access for young cyclists, are a feature of Residential Streets.

The pedestrian realm will be designed to facilitate the linking function Residential Streets with connecting neighbourhood parks with each other.

Well-lit pedestrian paths, which will be wide enough to provide some access for young cyclists, are a feature of Residential Streets.

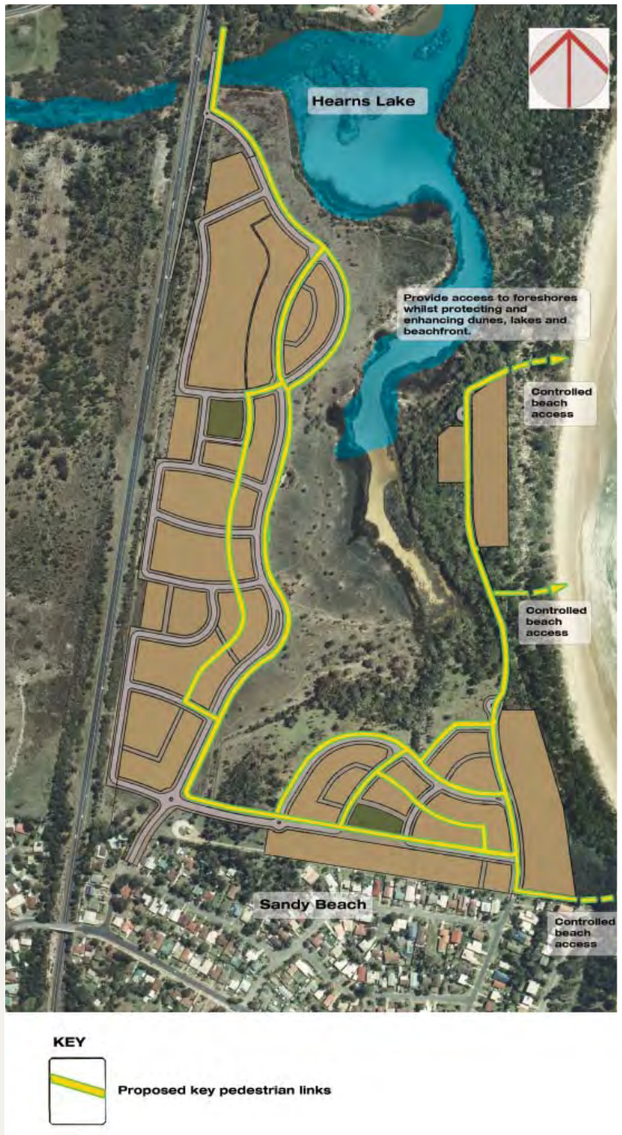


Fig 41 - Pedestrian network

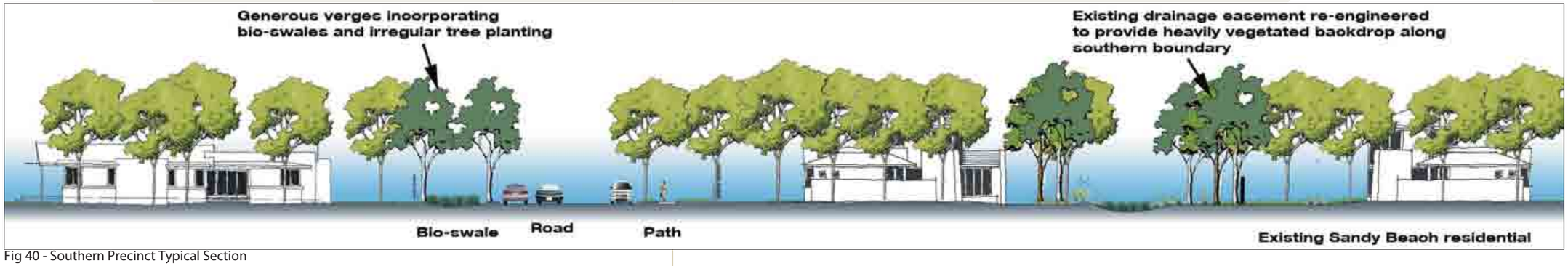


Fig 40 - Southern Precinct Typical Section

4.7.9 Streetscape Character

The streetscape character will have a strong legible hierarchy with a shady network of streets, with green links and views (and access) onto parks.

Street trees will provide an important element of the landscape strategy as people often recall places because of the memories created by distinctive streetscapes. Trees and other landscape elements along roadways are designed to reinforce themes, frame views and create attractive walking experiences.

The concept plan embraced a distinctive and legible street pattern and hierarchy. Avenues of taller canopy trees are proposed to the primary access roads and adjoining public open space whilst smaller trees are proposed to local access roads to establish an appropriate streetscape scale throughout the development. These trees will be selected from indigenous vegetation communities to reinforce a visually integrated streetscape within the broader landscape beyond the site. Key Streetscape design principles include;

- fostering a community identity of "coastal bushland" through attractive street entrances and developing leafy canopies utilising the verge areas for substantial tree planting,
- garages being located off rear lanes and special access courts to maximise positive street address, creating high quality public domain and encouraging walking,
- use of a balance of endemic planting grown from local provenance seed and cultural planting that maximises solar access and provides a reference point to historic species and local planting patterns,
- creating a project identity through special landscape treatments, particularly at entry points and major intersections, including use of plant materials to provide sense of scale
- blocks will incorporate mews or shared driveways at the rear of lots so that streets are not dominated by cars or garages,
- use of alternative pavement surfaces to distinguish thresholds, entry points and pedestrian movement (whilst complying with council requirements)
- careful selection of trees to provide an effective canopy across the street, avoiding damage to the pavements and minimizing water consumption

Collector Road – Boulevard

The collector road functions as a scenic spine providing a meandering travel route with generous verges to increase the "green" presentation of the development, with the majority of lots access denied to ensure a continuous tree canopy and landscape frontage.

The road will also define the main pedestrian link to the beach access for the development. The boulevard functions as a scenic spine providing a meandering travel route with generous verges to increase the "green" presentation of the development, with the majority of lots access denied to ensure a continuous tree canopy and landscape frontage. All residential buildings that face the Collector Road will 'address' the street and provide an active frontage to that street.

There will be three entry roads which serve as collector roads and meet the Primary Loop Collector Road. An avenue of tall indigenous street trees will reflect the importance of the road, forming an extension of the dominant tree species of the existing tree cover. To allow for the 2.5m shared path within the verge the street trees will be located within the parking reserve on the west side. The junction with the riparian corridor and location of the fauna underpass for the Wallum Froglet will be densely planted with tree and shrub species of the adjacent bushland vegetation, creating a threshold and ensuring a link is maintained between the two corridor areas

The collector road will be distinguished by regular planting of large native canopy, with the width enabling double alternate rows. The collector road will connect onto the external network at three locations, with two permanent locations along the southern boundary and a long term connection along the Pacific Highway, via the Woolgoolga interchange.

Landscape treatments to this road and pedestrian link will seek to define its significance and to reflect the retained landscape features of the site. An avenue of tall indigenous street trees will reflect the importance of the road, forming an extension of the dominant tree species of the existing tree cover.

Road Reserve: 21m
Carriageway: 11m two way incorporating parking on both sides
Verges: 5.0m both sides, incorporating 2.5m shareway to one side and swale (as required) and 1.5m path on alternate side.
Street trees: In parking lanes and verge

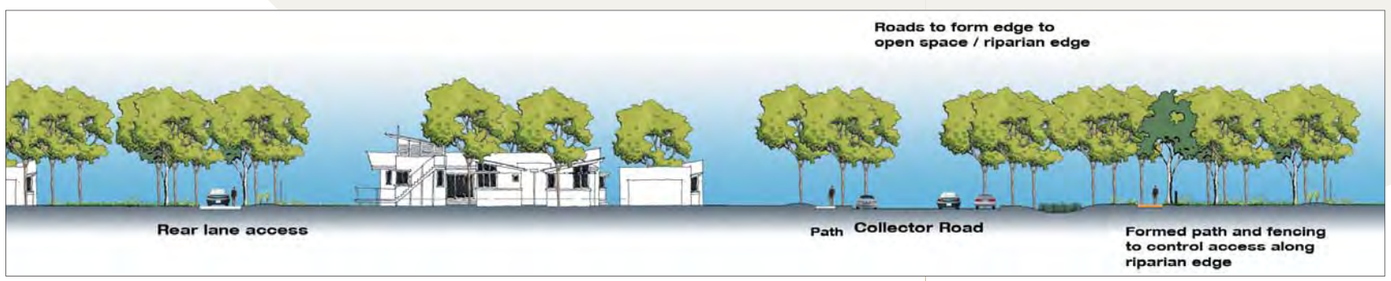


Fig 42 - Collector Road Typical Section

Sandy Beach North will ensure that facilities, services and initiatives are delivered in a timely, innovative and sustainable manner

All parks and open space areas edged by roads creating definition between the built areas, enabling a defined management edge and providing a high degree accessibility and surveillance for all residents.

Fig 43 - Typical landscape treatment

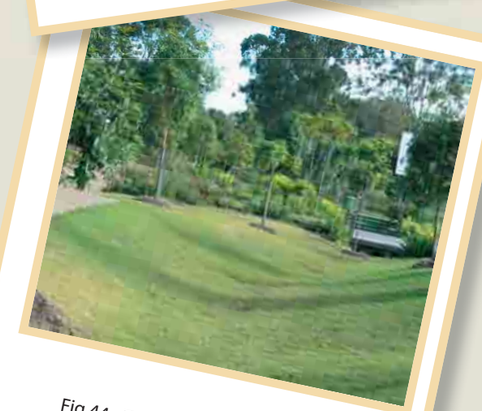


Fig 44 - Typical landscape treatment

Local Streets and Minor Local Streets

The local streets s provide for local traffic within the residential neighbourhoods and accommodate two travel lanes and two parking lanes and provide access to a majority of the lots , linking neighbourhood areas to the Collector Street system.

The streets will be designed to allow a free flow of traffic at low speeds with built-in speed controls used to regulate traffic flows. incorporating on-street parking and traffic calming features where appropriate.

The street trees are located within the verge in alternate arrangements or clusters and will form an extension of the front garden vegetation, providing shade, contrast and character, selected from a palette of medium sized native trees.

Road Reserve: 16 metres
Carriageway: 8.0 metres two way incorporating Parking Lanes(both sides)
Verge: 4.0 metres both sides or 5m to one side where swale occurs
Street Trees: In verge
Footpaths: One side 1.5m wide

Minor Local Streets

The minor local streets are an extension of the local streets, but with wider verges and reduced carriageway widths, reflecting the lower traffic requirements.

As per the local streets, th street trees are located within the verge in alternate arrangements or clusters and will form an extension of the front garden vegetation, providing shade, contrast and character, and selected from a palette of medium sized native trees.

Road Reserve: 16 metres
Carriageway: 7.0 metres two way incorporating Parking Lanes(both sides)
Verge: 4.5 metres both sides
Street Trees: In verge
Footpaths: One side 1.5m wide

Mews

Smallest of the roads is the 13.5m reservation with a 5.5m carriageway and 4.0m wide verges.

Street trees will be selected from a palette of small to medium height trees with distinctive habit i.e. flowers and foliage,

Road Reserve: 13.5 metres
Carriageway: 5.5 metres two way incorporating Parking Lanes (alternate sides)
Verge: 4.0 metres both sides
Street Trees: In verge
Footpaths: 1.5m on one-side

(Beach) Accessways

Providing access to the beach precinct with 13.5m road reservation and 5.5m carriageway with 12m turning circle, sufficient for service and emergency vehicles.

Dense planting will be located along the road edges to give privacy to the adjacent Beachfront lots.

The Beachfront Homes have rear access with an east facing garden overlooking the beach. The landscape character to these homes will be a reflection of the contemporary home design and the coastal environment.

Fencing will be sited within planting to soften its built form. A pedestrian link will be provided from the Beachfront homes to the main spine and beach access.

Road Reserve: 13.5 metres
Carriageway: 5.5 metres two way incorporating Parking Lanes (alternate sides)
Verge: 4.0 metres both sides
Street Trees: In verge
Footpaths: 1.5m on one-side

Fig 46 - Typical beach link road section

Shareways

Shareways provide rear lanes access to the garages. They include street tree planting and permeable paving and will function as a shared way. Activity on these lanes is encouraged. This is to include passive surveillance by partially open fencing within the lots to encourage community use and by the provision of studios or accessory dwellings over some of the garages.

The shareways supplement the street hierarchy by providing rear access to some houses to reduce the impact of front driveways on pedestrian corridors and the collector roads. The traffic speeds would be controlled, giving these streets the character where people can interact in relative safety and allowing them to be used as public open space.

Shareways carriageway widths are 5.5m wide, with maximum length for vehicles 50m.

Road Reserve: 8 metres
Carriageway: 5.5 metres two way incorporating Parking Lanes (alternate sides)
Verge: 2.5 on alternate sides
Street Trees: In carriageway

Fig 45 - Typical local road section

4.8 Landscape treatments

The landscape proposals for the development have been based on distinctive character zones, responding to both the site and proposed layout.

Landscape treatments will seek to define the public and private realm of the route. Groups of a feature tree and palm planting will mark the entry to individual residential precincts. This 'public' part of the road will be reinforced with an alternative road surface treatment., such as granite setts

4.8.1 Entry Zone

The intent of 'entry landscape' is to create a legible entry points to the site. Entry to the site is proposed from three locations

- two entry points from the southern boundary via the existing Sandy Beach village
- future entry points from the north via the propsed Woolgoolga interchange as part of the Pacific Highway upgrade

At each entry feature trees, set within a garden area, incorporating signage and public art will serve to create a visual landmark. Bosque of palms will serve to create a strong vertical element. Understorey planting will be simple with mass planting, clean lines and a limited palette of indigenous species.

Signage will be sophisticated and contemporary, sensitive to the highway and coastal environment . Associated infrastructure, such as lighting, pavement and directional signage will be of a high quality and style to contribute to the overall character of the landscape. An alternative treatment to the road , such as granite setts will reinforce the entry into the village to the residential units.

These tree species will carry through the site to reinforce the hierarchy of the road system. Pedestrian movement is via a footpath system each side of the road is separated from the carriageway by a landscaped verge and street tree planting. Driveway access across the footpath is restricted to a limited number of lots fronting onto the lake edge, otherwise is via back lanes or accessways.

Fig 47 - Typical entry road section

4.8.2 Streetscape Bio-retention Area

These areasincludes the open space and streetscape as part of the stormwater detention for the site. Landscape design for these locations seeks to maintain views for the dwellings, provide for the filtration of stormwater and to provide a landscape of a high visual amenity.

The treatment to the detention area will be a combination of grassed and planted areas. Planted areas to the bio-retention area will include canopy trees with an understorey of native grasses and sedges to read as part of the streetscape.

A range of constructed wetlands, , grassed swales, and stormwater quality improvement devices will be incorporated into the development. This will ensure impacts of runoff are minimised and opportunities to use water for other values is optimised. The approach to design of the system of water management will be guided by the context of the development as wel l as national water quality guidelines.

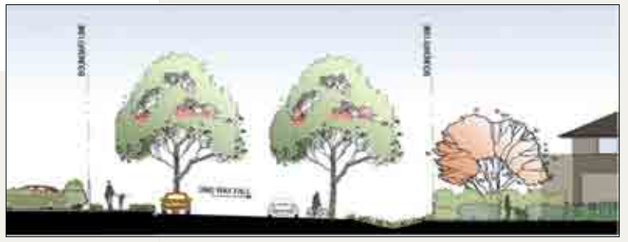


Fig 48 - Typical road section with bio-swales

4.8.3 Noise Barrier

The Pacific Highway forms the western boundary of the site. Road traffic noise from the Pacific Highway is by far the most significant noise source in the vicinity of the site.

The most effective means of noise control was determined to be a combined earthmound and 4.0mm high noise barrier located along the full length of the western edge adjacent the Pacific Highway.

The noise wall placed on top of mounding, with planting on either side, will provide a visual buffer for the development. Some existing planting will removed for construction and ongoing maintenance of noise wall, but compensated by substantial with new planting.

- screening from development side using vegetation and mounding,
- as close as possible to road edge, far away as possible from development,
- accept some existing planting removed for construction of noise wall, but replaced with new planting.

With noise mounds and barriers in place, the predicted traffic noise within the site will significantly decrease to be well within the Environmental Protection Authorities requirements.

The type, location and design of the noise wall would be subject to consultation with RTA. Considerable planting either side of the noise wall would be undertake to integrate the noise wall within the overall landscape.

4.8.4 Footpaths

Pedestrian footpaths along streets will be a minimum of 1.5 metres wide and continuous.

Safe crossings, designed to control vehicular traffic, will be provided to reinforce the pedestrian network. On pedestrian priority streets, footpaths will be as wide as 2.5m to enhance walkability.

The main principles for pedestrian circulation are:

- Provide safe and legible pedestrian paths
- Minimise vehicle and pedestrian conflicts
- Pedestrian paths line vehicle streets to increase surveillance

The internal pedestrian network links with the external pedestrian networks, providing good connections to the central boulevard along continuous, well lit footpaths located along all streets will provide clean, comfortable pedestrian access into and within the development.

Footpaths with a leafy canopy overhead will play an important role in providing public amenity and opportunity for neighbours to interact.

Footpaths to be provided on both sides of the boulevard, all other roads excluding the shareway to have footpaths on one side.

In addition pathways are proposed in and around the pocket parksand to form an edge to the riparian zone.

4.8.5 Road Bridge to drainage line:

Minor bridge crossing required over existing creek providing significant, place-making opportunities between the south-western and southern precinctssides.

Fig 49 - Typical road bridge over drainage line

4.8.6 Services:

Trees have locational priority in planning and design of utility and service provision.

Electricity Pillars to be located within landscape;

Street lighting to be consistant, coordinated with planting and fitting to reduce light spillage;

Electricity substations to be landscape screened; Communication retriculation conduits to have capacity for future change;

Underground services to be laid to consistant coordination plan; and Pits, sumps, grates, access covers to be visually coordinated in both materials and locations.

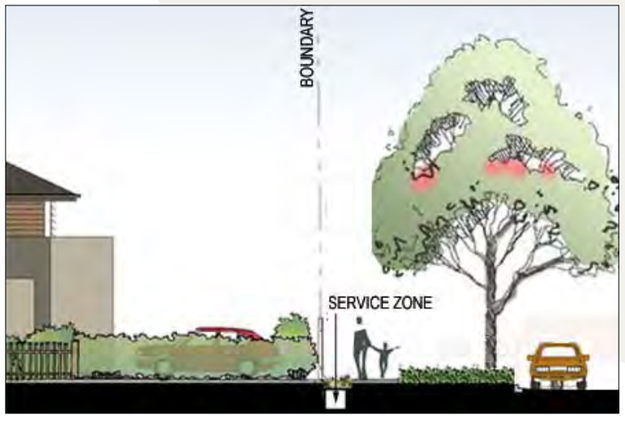


Fig 50 - Typical road section with shared services

4.8.7 Creek Lines

- Creek Lines – The one main creek line from the SW corner will be naturalized to offer a habitat for wildlife corridor to the lake edge and access routes to the beach. The landscape character is typically dense tree and shrub vegetation offering habitat and use to screen or frame views.

- Drain Easement – The existing de-naturalised channel is to be re-constructed as a meandering natural creek system offering groundwater infiltration, stormwater management, water quality improvement and native habitat opportunities.

4.8.8 Hearns Lake

The landscape 'spine' of the development is Hearns Lake, the largest area of undeveloped space. Within these area, the landscape will provide a transition between the 'naturalness' of the creek corridor, planted totally with endemic species.

The potential impacts of development upon Hearns Lake have been minimized by the establishment of a open space/conservation buffer of average width 100 metres around the lake edge. This buffer varies between 60 metres width and 150 metres width between the development edge and the lake edge.

Those areas where the buffer widths are at their narrowest (60m) generally correspond with higher elevations where vegetation and ecological communities are less fragile than those at lower elevations and stronger associations with the normal vegetation and ecological processes of the lake edge. These lower areas are protected by buffers of greater width (100m+).

A fencing regime will allow revegetation of degraded, sensitive and eroded areas. This fencing can be temporary in some areas to allow vegetation to establish. The planting of indigenous species should occur around parking areas to minimise visual impact and impact from run-off.

The fencing would be of simple nature, post and rail to 1200 high or similar, with educational signage to advise residents and visitors of its purpose.

Fig 51 - Realignment with existing drainage line

4.8.9 Pavements

Ground surface treatments and pavements can be a defining landscape element, providing an important means to add character and unity.

Overall a simple palette of paving materials is proposed throughout the site, with a limited selection of materials being used for each different pavement types.

A summary of finishes is as follows:

- Generally asphalt surface will be constructed for all roads, except at entry roads thresholds and parking bays where concrete unit paving will be introduced for visual contrast and traffic calming.
- Footpaths and driveways will be generally in-situ with brush or exposed aggregate finish, with bands of feature paving at strategic locations.

4.8.10 Street Furniture

The quality of site furniture will convey a strong image about the character of the development. A suite or family of elements is proposed across the development. The design or selection of individual elements will complement not only themselves, but also the visual context they are located in.

The appearance of street furniture elements, their style, structural soundness and the degree they can withstand vandalism by vandals and natural elements are the key success factors.

A necessary requirement of the street furniture is that they are functional, robust and generally require low levels of maintenance. Additionally, street furniture and hardscapes should exhibit a commitment to environmental protection and sustainability through choice of materials and method of manufacture.

Furniture should be fixed below the ground to avoid relocation or theft. The furniture is also to match council standards.

seats, benches and bins

Seats and benches are to be provided within the open space areas. Seats and benches are to be setback from pathways so as not to become a hazard for walkers. Where possible seats and benches are to take advantage of views and ensure surveillance of the open space.

The selection of timber slatted seats and benches are preferred to maintain an ageless quality to the reserve.

Bins are located on the basis of simplicity of design, robustness, durability, and resistance to vandalism, accessibility and maintenance.

signage

Signage is an important aid to negotiation for all people visiting the development, whether it is directional for pedestrian and vehicular traffic to the identification of individual streets.
Key locations for signage include:

- Directional signage for vehicular and pedestrian movements at the proposed entrances
- Information signage to the open space describing use and to conservation areas to riparian edge, lake and dune
- Street signage to each street
- All information will be clear and precise, clearly identifiable and easy to read and in accordance with Council standards
- Low walling with signage at the northern and southern approaches to the boulevard to announce the arrival to development

Through signage there is an opportunity to capitalise on the cultural and natural interpretation of the area. There are excellent opportunities for the interpretation of natural and cultural themes to enhance the visitor experience whilst increasing an awareness and understanding of the area.

This can be achieved through signage graphics, street naming and information, particularly in the open space areas.

lighting

Quality lighting will improve the legibility of critical nodes, activity and circulation zones within the development. It will also facilitate the safe movement of pedestrians and vehicles and promote a more secure environment and minimise potential for harm and damage to property.

The main lighting criteria include:

- Street lighting for both vehicles and pedestrians will be used for all roads.
- Low level lighting to be incorporated along the pedestrian links and edge of the parks.
- Solar power lighting should be encouraged and incorporated wherever practical.
- Hierarchy of lighting to correspond to the hierarchy of road circulation.
- Spacing, height and distribution patterns of lighting to avoid foliage shadows and ensure good uniformity and vertical surface illumination.

4.8.11 Landscape Planting Strategy

Plant selection will take into consideration the specific climatic and soil conditions of the site, as well as solar access and protection from prevailing winds and be predominantly based on endemic plant lists. The use of endemic plants will assist in reducing water and maintenance requirements as well as enhance biodiversity and integration with the local surroundings, views and vistas.

Verges will be widened within the street to include the water sensitive urban design requirements. These will appear be fully landscaped areas and will provide additional visual amenity for the residents.

A continuous canopy of trees on the local streets and a ground layer of endemic, ephemeral wetland species and ground cover plants will create a layered effect, which combined with vegetated swales will enhance local biodiversity. Planting will play a significant role in establishing a distinctive residential environment with coastal ambience.

The tree planting reflects the hierarchy of the roads: Larger trees to be used as orientation and views allow – along the principal roads, with smaller, largely trees to local roads and mews.
The boundaries of the site are of particular sensitivity and importance. They should be designed to subtly blend with the surrounding land;

The following principles have been established to guide the planning of the Street Tree Concept plan:

- provide vegetation corridors for flora and fauna movement through the site, providing habitat establishment opportunities,
- recognise and reinforce the street network, pedestrian/bicycle routes and park landscapes,
- establish a streetscape palette of indigenous trees and shrubs reflective of existing vegetation communities to improve visual integration,
- species selection to perform well in the local environmental conditions, appropriate to coastal climatic exposure,
- exotic species to be avoided in proximity to the bushland corridor, restricted to feature plantings in core communal areas only,
- provide adequate solar access whilst also providing shade for pedestrians, utilising deciduous and evergreen trees with relatively open canopies, and
- provide identity for individual streets within the development and provide opportunities to strengthen community 'ownership' and sense of neighbourhood.

The collector road and entry roads will be distinguished by regular planting of large scale canopy trees. The local and minor roads will be planted with smaller canopy trees in alternate arrangements.

Infrastructure items such as meter boxes, water services, air conditioning units, gas meters and the like will be positioned or screened from public view so as not to detract from the streetscape setting.

Street tree planting will incorporate an indigenous species found within the 7(a) vegetation . Tree planting will be in an informal layout. Revegetation planting to the 7(a) vegetation will extend from the road edge with consideration will be given to including a barrier fence to this revegetation along the road edge with this fence custom designed to read as part of the streetscape.

4.8.12 Planting Design

The planting design for the development incorporates the following:

- The majority of the site will be planted native trees reflecting the local character, whilst the feature planting will be associated with entry points and community meeting place. The verges will include both turfing and mass planting. To verges at intersec tions and adjacent entry areas low colourful planting will be emphasised.
- Formal arrangement single species semi-mature trees at major entry points and internal nodal points, with accent lower planting to provide visual interest.
- Preference for use of trees with clear stem trunks combined with turf and low shrubs for greater visibility and thereby a safer environment.
- Provision of biodiversity; with significant proportion of indigenous plantings within the street, community, and private domain areas; subject to council
- The development of a sustainable irrigation system for the open space areas incorporates the principles of water sensitive urban design to establish a sustainable water supply for irrigation, primarily through adoption of water wise landscape practices (i.e. micro irrigation, mulch, wetting agents)

4.8.13 Parks

Within the development there are two pocket parks located strategically within the developemnt toprovide recreation and social gathering opportunities for the community, with combination seating, walkways and tree planting.

The pocket park forms the focal point for the residents and is surrounded on all sides with housing and roads offering excellent visual amenity for the residents and providing casual surveillance of the activities within the spaces.

Sculptural and interpretive equipment and groundform, combined with interactive art works would be encouraged, to facilitate learning through exploring and imagination.

Any playground equipment should be made of durable materials, with softfall installed at the base in accordance with Council and Australian standards.

4.8.14 Revegetation

The area zoned 7(a) vegetation that is located approximately at the centre of the site, surrounding Hearns Lake will be extensively revegetated as per the recommendations Vegetation Management Plan for this location. Revegetation works will include remove of weeds and pest plans with all planting using plant species found within the 7(a) environmental protection area. A barrier fence will be designed that restricts access into the zone, but is also in keeping with the high visual amenity and character of the development.

The existing hind dune vegetation will be retained, weeded and supplemented with new planting of coastal groundcovers. A dune protection fence will be located along the revegetation edge to restrict access into this area. Public access will provided along to provide a link to the 'Beach. Signage will be included at the entry to this walk indicating the link to thebeach. Facilities such as a beach shower and seating will be located at the public beach access.

4.8.15 Private Domain Open Space

The vision for private domain is that it talks to its context whilst at the same time developing the individual and garden landscape oriented character at the residential level. This vision enhances visual interest, sense of place and identity to neighbourhoods, and a residential pride in the quality of private domain environment. Key objectives for landscape outcomes in the private domain include:

Maximisation of existing tree retention: The retention of existing trees which have long term viability through residential development areas will provide an immediate level of character and landscape amenity to these areas, given the time periods for tree planting to mature and provide maximum visual, shade, and scale benefits.

Reinforcement of existing trees: It is desirable that existing trees retained are reinforced with additional plantings to development potential habitat / foraging for native birds.

Reinforcement of native canopy: In addition to the maximisation of existing tree retention and the reinforcement of these specimens / stands where they occur it is desirable that scattered native canopy is extended through the private domain in appropriate locations (eg to property boundaries and front boundaries, integrating consideration of overshadowing / stability issues)

The private realm within the development should reflect and enhance the character of the site and surrounds. Achieving a continued landscape amenity within the private realm requires an appreciation of the composition of the development and architectural elements.

Front yards or 'town gardens' of the private lots will provide the opportunity for residents to express their own style and contribute to the streetscape without changing the dominant woodland rural character of the release area. Planting will be encouraged to provide seasonal flowering habit, pleasant scents of flowers, textures and colours of foliage and bark. Use of native species should be encouraged to achieve the desired 'woodland' character of the development. Exotic species will be encouraged to be restricted to within the building platform.

Front gardens should extend to the street boundary and be defined by a fence , shrubs, mass planting, or hedges that clearly defines the private and public domains., additionally providing a for both privacy and to give the streetscape agreen leafy character.

4..8.16 Plant material

Plants, particularly trees, are to be selected and located with consideration to their functional, aesthetic and horticultural requirements.

A schedule of planting species has been prepared with the aim of providing a consistent framework of vegetation and planting character across the site.

Obviously there will be variations as a result of the design layout and site conditions nevertheless, a shaded woodland planting character throughout the site, with minor species variations made in light of design considerations.

The planting schedules indicate native and feature trees, shrubs and groundcover/ grasses.

For indigenous planting seed collection and propagation of indigenous seed to commence as early as practically possible.

Collection and propagation of indigenous seed on site or from neighbouring areas for re-establishment of an indigenous tree cover over the site. The early collection and propagation of seed will enable the establishment of semi-mature plant stock which will meet the needs of marketing.

Indicative Plant Schedule

Trees

Botanical Name	Common Name	Height	Description
Cupaniopsis anarcardiodes	Tuckeroo	10-15m	native evergreen flowering
Angophora floribunda	Rough-barked apple	12-15m	native evergreen
Eleocarpus reticulatus	Blueberry Ash	8m	native evergreen flowering
Corymbia maculata	Spotted Gum	30m	native evergreen
Eucalyptus salignus	Gum	10-15m	native evergreen
Flindersia australis	Flindersia	20m	native semi evergreen flowering
Jacaranda mimosifolia	Jacaranda	10m	exotic deciduous flowering
Lophostemon confertus	Brush Box	15 - 30m	native evergreen
Melaleuca stypheliodes	Paperbark	10-12m	native evergreen flowering native
Melaleuca linarifolia	Snow in summer	10m	native evergreen flowering native
Pittosporum rhombifolium	Diamond Laurel	10m	evergreen flowering
Tristaniopsis laurina	Water Gum	6 - 10m	native evergreen
Hymenospermum flavum	Native Frangipani	8 - 10m	native evergreen
Eucalyptus nicholi	Willow leaf peppermint	15-20m	native evergreen flowering
Syzygium australe	Brush Cherry	15m	native palm
Livistona australis	Cabbage palm	15m	palm
Roystonea regia	Royal Palm	15m	evergreen
Araucaria heterophylla	Norfolk Island Palm	20m	evergreen

Understorey/Groundcover

Dianella revolute	Spreading Lily	500mm - 1m	native evergreen flowering
Dianella longifolia	Flax Lily	500mm - 1m	native evergreen flowering
Dietes grandiflora	Wild Iris	750mm	exotic evergreen flowering
Brachycome multifida	Brachycome	Prostrate	native evergreen flowering
Grevillea x gandichaaudii	Prostrate Grevillea	Prostrate	native evergreen flowering
Helichrysum ramosissimum	Paper Daisy	Prostrate	native evergreen flowering
Lomandra longifolia 'Katrinus'	Mat Rush	700mm	native evergreen flowering
Poa siberiana 'Eskdale'	Poa	300mm	native evergreen
Pennisetum alopecuroides	Pennisetum	Prostrate	native evergreen
Wahlenbergia gracilis	Native Blue Bell	500mm	native evergreen flowering

It is important to note that this plant schedule is indicative only and subject to further review with council, in the areas of using indigenous plants, maintenance requirements and public liability.

Fig 52- 57 Plant material

4.8.17 Indigenous planting

List of indigenous/low water use species
COFFS HARBOUR COUNCIL

This council list indicates locally occurring native species which may be available from nurseries and suited to landscaping or natural area restoration for consideration.
*Large trees not suited to residential lots

Koala Food Trees*

Eucalyptus microcorys (Tallow Wood)
Eucalyptus robusta (Swamp Mahogany)
Eucalyptus punctata (Grey Gum)
Eucalyptus propinqua (Small-fruited Grey Gum)
Eucalyptus tereticornis (Forest Red Gum)
Eucalyptus pilularis (Blackbutt)
Eucalyptus grandis (Flooded Gum)
Eucalyptus signata (Scribbly Gum)
Eucalyptus maculata (Spotted gum)
Melaleuca quinquenervia (Broadleaved paperbark)

Trees

Acacia melanoxylon (Black Wattle)
Acmena smithii (Lilly Pilly)
Acronychia imperforata (Beach Acronychia)
Acronycia littoralis (Scented Acronychia)
Alectryon coriaceus (Beach Birds Eye)
Allocasuarina littoralis (Black Oak)
Alphitonia excelsa (red Ash)
Araucaria cunninghamii (Hoop Pine)
Backhousia anisata (Aniseed Tree)
Callicoma serratifolia (Black Wood)
Callistemon salignus (Pink Tips Bottlebrush)
Casuarina glauca (Swamp Oak)*
Cassine australis (Red Olive Plum)
Cryptocarya triplinervis (Three Vein Laurel)
Diploglottis australis (Native Tamarind)*
Dysoxylum mollissimum (Red Bean)
Elaeocarpus reticulatus (Blueberry Ash)
Elaeocarpus grandis (Quandong)*
Ficus coronata (Creek Sandpaper Fig)
Glochidion ferdinandi (Cheese Tree)
Guioa semiglauca (Guioa)
Jagera pseudorhus (Foambark)
Lophostemon confertus (Brush Box)*
Trees (cont)
Melalueca linariifolia (Snow in Summer)
Melaleuca quinquenervia* (Broad Leaf Paperbark)
Neolitsea dealbata (White Bolly Gum)
Omalanthus nutans (Bleeding Heart)
Pandanus tectorius var. australianus (Screw Pine)
Pittosporum rhombifolium (Holly Leaf Pittosporum)
Pittosporum undulatum (Sweet Pittosporum)
Planchonella australis (Black Apple)
Polyscias elegans (Celerywood)
Polyscias murrayi (Pencil Cedar)
Rapanea variabilis (Muttonwood)
Rhodomyrtus psidioides (Native Guava)
Rhodamnia rubescens (Brush Turpentine)
Sloanea woollsii (Yellow Carabeen)*
Syncarpia glomulifera (Turpentine)
Synoum glandulosum (Scentless Rosewood)
Syzygium australe (Brush Cherry)
Syzygium luehmannii (Riberry)
Syzygium oleosum (Blue Lilly Pilly)

Shrubs

Acacia floribunda (Sally Wattle)
Banksia spinulosa
Breynia oblongifolia (Dwarf's Apple)
Cordyline stricta (Narrow Leaved Palm Lily)
Cyathea australis (Rough Tree Fern)
Endiandra sieberi (Corkwood)
Eupomatia laurina (Bolwarra)
Leptospermum flavescens
Psychotria loniceroides (Hairy Psychotria)
Pittosporum revolutum (Yellow Pittosporum)
Tabernaemontana pandacaqui (Banana Bush)
Wilkiea huegeliana (Veiny Wilkiea)

Ground Covers/Climbers

Adiantum hispidulum (Rough Maiden Hair Fern)
Alpinia coerulea (Native Ginger)
Billardeira scandens (Apple Berry)
Blechnum nudum (Water Fern)
Blechnum cartilagineum (Gristle Fern)
Brachyscome spp. (Native Daisy)
Cissus antarctica (Kangaroo Vine)
Cissus opaca (Native Grape)
Commelina cyanea (Blue Wandering Jew)
Crinum pedunculatum (Swamp Lily)
Derris involua (Native Derris)
Dianella caerulea (Flax Lily)
Doodia aspera (Rasp Fern)
Hardenbergia violacea (Native Sarsparilla)
Helichrysum spp. (Native Daisies)
Hibbertia scandens (Snake Vine)
Hibbertia dentata (Guinea Flower)
Hoya australis and H. oligotricha (Waxflower)
Ipomea pres-caprae (Goats Foot)
Kennedia rubicunda (Red Coral Pea)
Lomandra longifolia (Mat Rush)
Morinda jasminoides (Jasmine Morinda)
Pennisetum allopecuroides (Swamp Foxtail)
Plectranthus cremmus (Coastal Mint Bush)
Pultenaea villosa and retusa (yellow pea)
Rhodanthe spp. (Native Daisy)
Scaevola (Blue Fan Flower)
Stephania aculeata, S. japonica (Snake Vine)
Smilax australis (Barbed Wire Vine)
Smilax glyciphylla (Native Sarsparilla)
Themeda australis (Kangaroo Grass)
Viola hederacea (Native Violet)
Zieria prostrata (Headland Zieria)

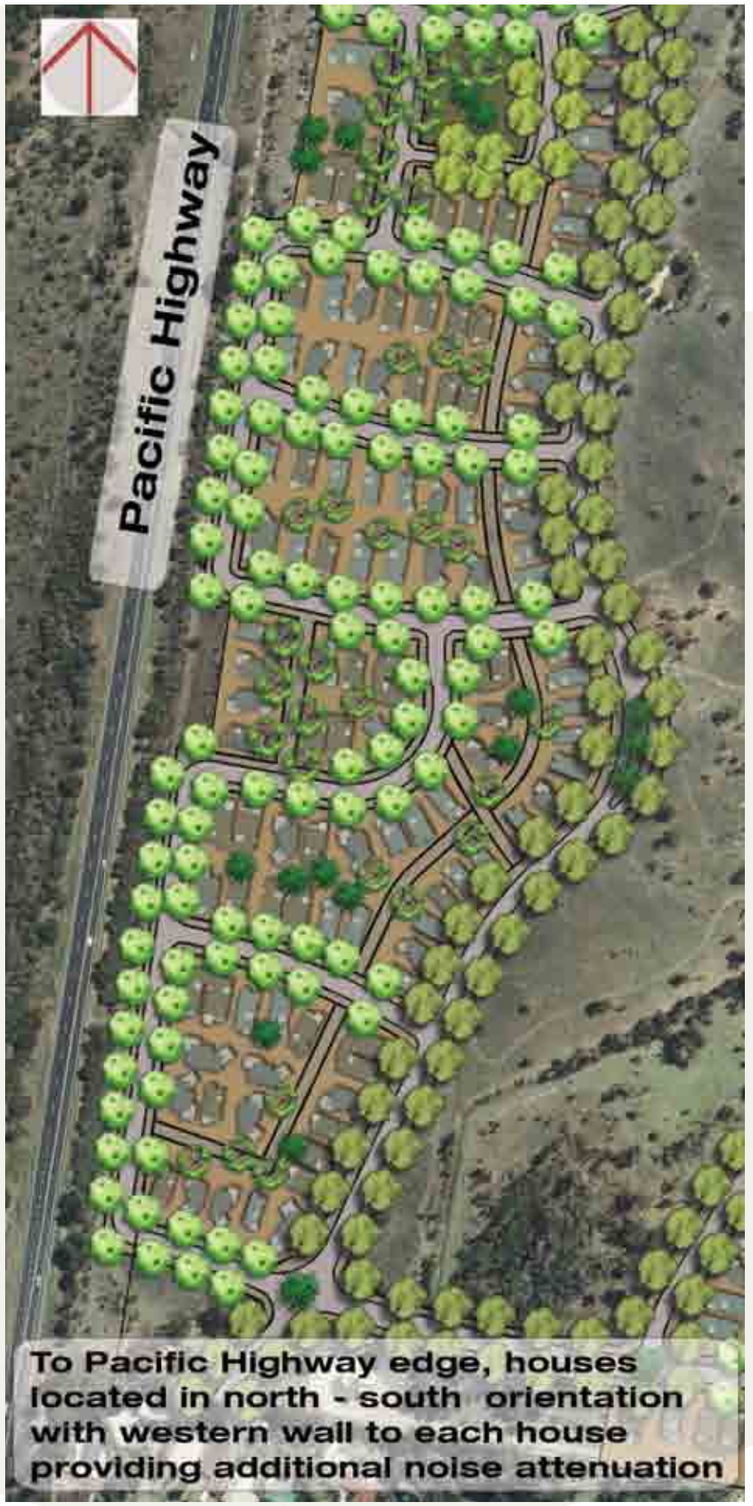


Fig 58 - Typical options for Pacific Highway edge

5.0 Noise

51 Traffic Noise Impact and Control

The most effective means of noise control will be a combined earth mound and 4.0m high masonry noise barrier located along the full length of the western edge of the site adjacent the Pacific Highway and with a setback distance of 10m from the Highway". Ideally, the proposed noise barriers should be located as close as possible to the noise source, in this case the Pacific Highway to provide optimal benefit.

With noise mounds and barriers in place, the predicted traffic noise within the site will significantly decrease to be well within the Environmental Protection Authorities requirements.

The noise wall placed on top of mounding, with planting on either side, will provide a visual buffer for the development. Some existing planting will removed for construction and ongoing maintenance of noise wall, but compensated by substantial with new planting.

5.2 Built Form

To ensure acceptable noise impacts both in terms of internal and external noise the building design of dwelling located on the far western side of the site adjacent to the Pacific Highway will be constructed such that they provide a secondary barrier effect. This will ensure internal noise levels within these dwelling are at an acceptable standard and also provide additional amelioration of noise impacts at residential locations further to the east The Boundary subzone is created separately, as it plays a vital role in the sound attenuation of the Pacific Highway.

The designs of the proposed buildings are intended to form a sound wall to the Western edge, with the house opening up to the East. The sound wall will included double-glazed fixed windows and heavy materials, culminating in a tall parapet to deflect noise over the development. This design will work in association with the proposed stand-alone sound wall on the site boundary.

6.0 WSUD and Earthworks

6.1 Water Cycle Management

The approach for addressing the potential impacts, as set out in those technical reports are considered to result in the proposed development providing a benchmark in Ecologically Sustainable Development (ESD) incorporating the latest techniques in Water Sensitive Urban Design (WSUD).

This outcome will be achieved by the sustainable management of stormwater runoff, using provisions for the harvesting of rainfall for water re-use/recycling and the treatment of residual runoff, prior to any discharge to Hearns Lake.

The overall objectives of the Concept Plan for the proposed development for water cycle management are:

- to provide a neutral or beneficial effect on sediment and nutrient export rates from the new development;
- to protect natural water systems within the urban development and to enhance water quality;
- to minimise contaminant transport from stormwater,
- to protect riparian ecosystems, including restoration of degraded ecosystems,
- to improve water use efficiency, and reduce demand for mains water,
- to maintain peak flows, velocities and volumes of stormwater runoff at pre-development levels;
- The reduction of the volume of runoff flowing from the residential development and the minimisation of impervious surfaces; and use of porous pavers
- to integrate stormwater management into the landscape, creating multiple use corridors that maximise the visual and recreational amenity of the urban development; and,
- to minimise drainage infrastructure cost and maintenance requirements.
- the use of water conservation devices within each dwelling;
- integration of stormwater storage within urban areas whenever possible;
- maximized use of local indigenous vegetation in treating stormwater, particularly vegetation,
- incorporation of vegetated and lined biofiltration swales within the road reserve to provide physical and biological treatment of runoff from road and paved surfaces
- incorporation of water quality control ponds at key locations within the site to provide opportunities for physical, chemical, and biological treatment of stormwater runoff

The Water Management Strategy includes Water Quality Control Ponds (WQCPs) which are to be strategically sited at the locations . The WQCPS have been sited as shown to minimise the extent of earthworks that will be required, while at the same time maximising the opportunity for runoff residence times and runoff treatment.
The proposed storm water management strategy for the development will improve the quality of runoff distributed to the lake from the existing land surfaces. These works will help to ensure that lake water quality and the existing ecosystem are maintained, if not improved.

The water management measures have been designed to ensure that there will be no net increase in nutrient and pollutant loading to Hearns Lake as a consequence of the proposed development. In fact, the results from the analysis suggest that the proposed measures will reduce existing estimates of the nutrient loading to the lake.

The inclusion of the proposed bio-retention systems, water quality control pondsand associated water sensitive urban design features, will suitably treat and polish runoff from the construction and developed site, and ensure that runoff discharged to Hearns Lake is of a quality that will not adversely impact on the lake hydrology and associated ecosystems. These water management measures have been designed to ensure that there will be no net increase in nutrient and pollutant loading to Hearns Lake as a consequence of the proposed development. In fact, the results from the analysis suggest that the proposed measures will reduce existing estimates of the nutrient loading to the lake.

Fig 59 - Major Components of proposed Water Management Strategy

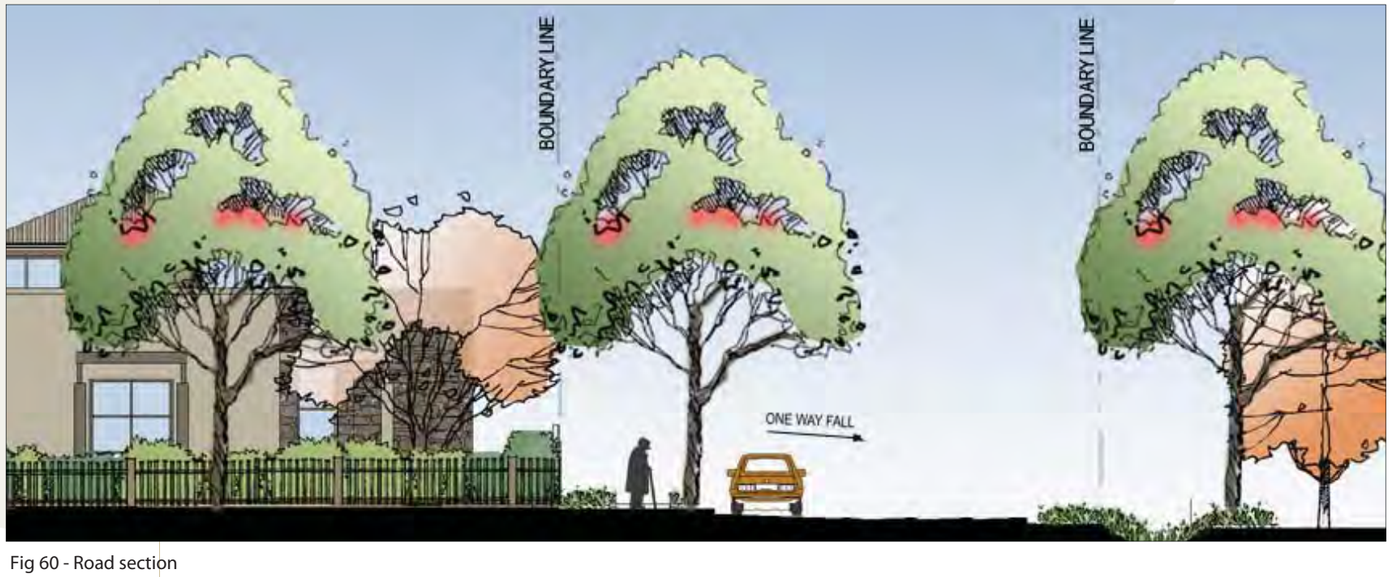


Fig 60 - Road section

6.2 Earthworks and Filling -

To comply with Council's current Flood Policy, the floor level of all habitable dwellings must be located at least 500 mm above the designed 100 year recurrence flood level.

All bulk earthworks will be undertaken in accordance with an approved Soil and Water Management Plan. Any fill imported to the site will be approved by an engineer prior to the import of the fill to the site, and shall be of a sound clean, material, reasonable standard, and free from large rocks, stumps, organic matter and other debris. Where ever possible, material having similar properties to the in-situ site material shall be sourced.

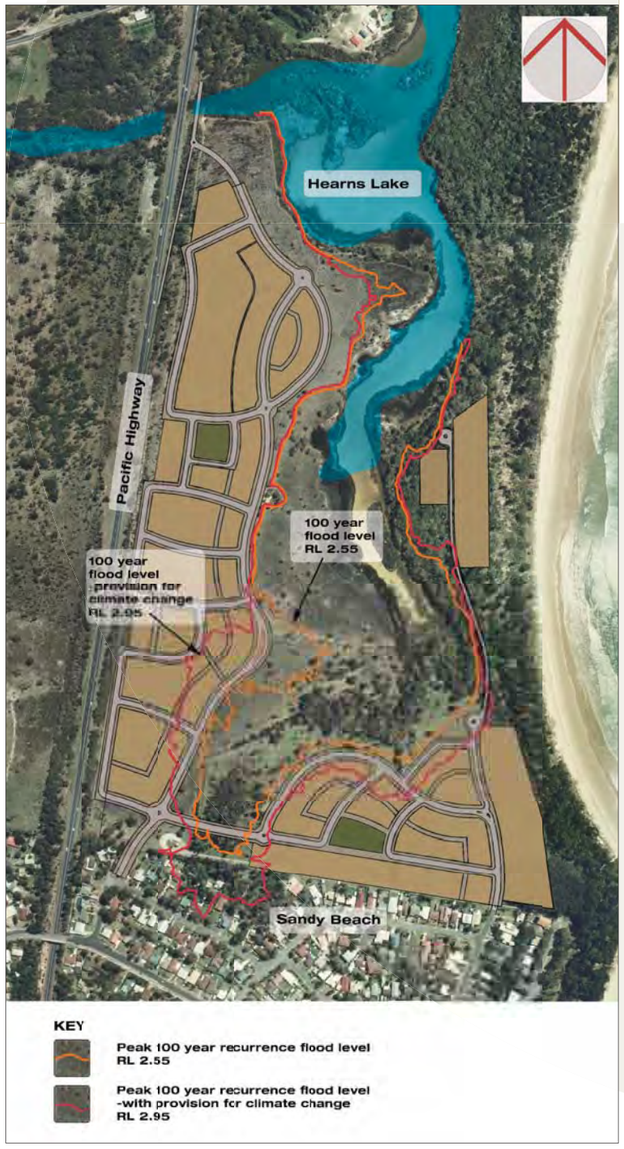


Fig 61 - 1:100 flood extent superimposed over concept plan layout

Fig 62 - Proposed areas of filling

Fig 63 - Post development 1:100 year flood extent

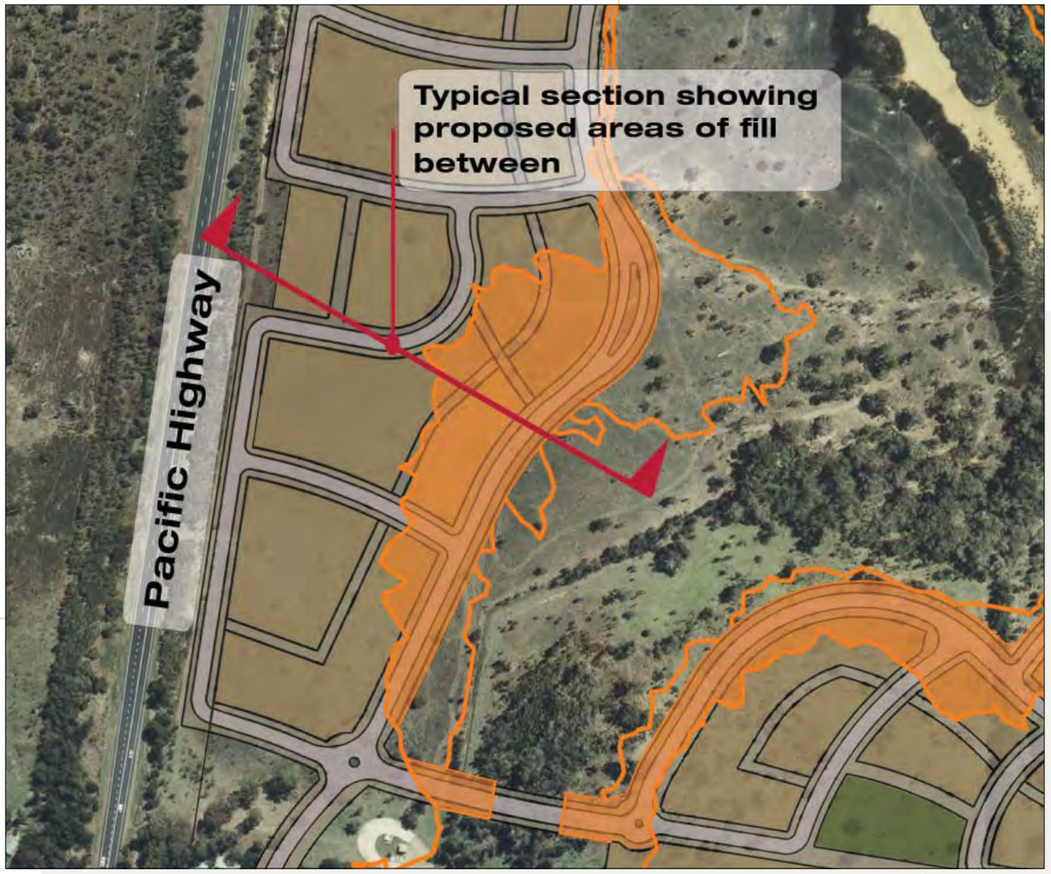


Fig 64 - Enlargement of earthworks

Fig 66 - Panoramic image of development

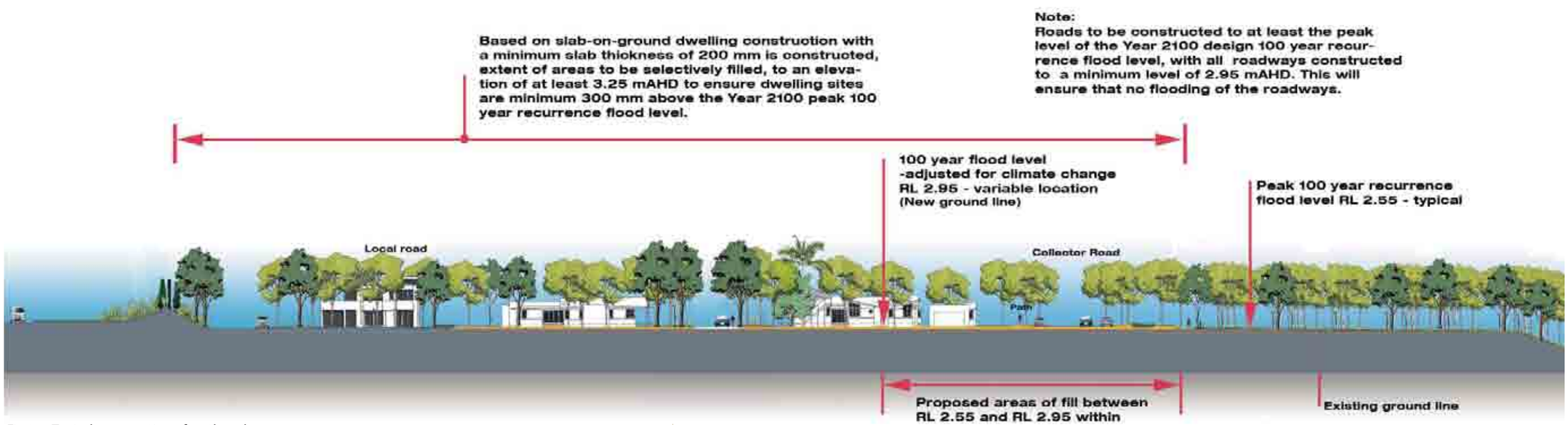


Fig 65 - Typical cross section of earthworks

7.0 Bushfire Summary

7.1 Bushfire Protection

The proposed development is within a bushfire prone area.

Recommendations have been made in respect of fuel management, construction standards/building protection, access, bushfire education and land ownership responsibility.

7.2 Recommendations

Recommendation 1 – The future development should be sited as indicated on the site concept proposal.

Recommendation 2 – The entire development area should be maintained by regular maintenance of the landscaped areas/mowing of lawns in accordance with the guidelines provided in Technical Report. Asset Protection Zones should be provided to the proposed development until the adjoining lands to the north are developed. They shall take the form of Inner Protection Areas, measured from the extremities of the buildings.

Recommendation 3 – The application of Level 2 construction standards of the Australian Standard AS3959 'Construction of Buildings in Bush Fire Prone Areas', in accordance with Part 2.3.4 of the 'Building Code of Australia', should apply to all future dwellings within the eastern periphery of the Western Precinct.

Recommendation 4 – The application of Level 2 construction standards of the Australian Standard AS3959 'Construction of Buildings in Bush Fire Prone Areas', in accordance with part 2.3.4 of the 'Building Code of Australia', should apply to the eastern aspect of all future dwellings along the eastern periphery of the northern portion of the site.

Recommendation 5 - The application of Level 3 construction standards of the Australian Standard AS3959 'Construction of Buildings in Bush Fire Prone Areas', in accordance with Part 2.3.4 of the 'Building Code of Australia', should apply to the western aspect of all future dwellings along the eastern periphery northern portion of the site.

Recommendation 6 – Access should be in accordance with 'Planning for Bushfire Protection 2001'. Internal roads of the subdivision should adhere to the requirements of public roads and be two way, that is, at least two traffic lane widths with shoulders on each side, allowing traffic to pass in opposite directions.

Recommendation 7 – Roof gutters and valleys to all proposed dwellings should be leaf proofed by the installation of an external gutter protection shroud, or a gutter system that denies all leaves from entering the gutter and building up on that gutter. Any material used in such a system should have a flammability index of no greater than 5.

Recommendation 8 – The landowner / Manager should be made aware of their liability to manage their development lands for the ongoing protection of themselves and their neighbours.

Recommendation 9 – The community title management plan should include management and performance criteria for the long term management of the asset protection zones provided around the residential areas backing onto the Hearns Lake open space area of the coastal reserve.

Recommendation 10 – A perimeter bushfire control track be established and maintained between residential areas and areas of bushfire hazard in the areas between Hearns Lake and future residential allotments.

Recommendation 11 – An asset protection zone of 10 metres width is to be provided to the roadway connecting the Southern and Eastern (Beach) Precincts. The turning circle at the northern end of this road is to have a minimum of 12 metres radius.

7.3 Bushfire Management

The proposed APZ will be managed under a vegetation management plan for Sandy Beach and implemented without negative impacts to the endangered ecological community. The Applicant retained Conacher Travers to advise on this matter. A copy of their Report is at Appendix 12. A detailed response to Bushfire matters is contained in the response to Key Issue 7.2 below. The Report provides a detailed analysis and assessment of the site, using the findings of the Ecological Survey and Assessment by Conacher Travers (see Appendix 5) as to the floristic mosaic of the site. The Specialist divided the site into precincts. From this analysis, the AZP are established and an appropriate management regime recommended.

The APZ could be both managed to achieve a fuel reduced zone and to remove significant weeds that threaten the native wetland vegetation. As required, additional weeding will be undertaken as part of the vegetation management plan.

Fig 67 - APZ Bushfire Protection Measures
(Refer Conacher report for greater detail)

8.0 Foreshore Management

8.1 Coastal Management

Biodiversity conservation is fundamental to the concept of Hearns Lake and is highly valued for aesthetic, scientific, recreational and cultural reasons. Consequently, the development has been designed in such a manner that recognises the biological diversity of the site and region to enable conservation of these values with particular respect to the Coffs Harbour Marine Park. To minimise edge effects created by the development adjoining the Coffs Coast Regional Park fencing will be provided along the boundaries to the sand dune to prevent uncontrolled access and allow for undisturbed regeneration and fauna movement.

Pedestrian access to beach area through the dune area will be via fenced walking tracks (refer plan), utilising elevated timber steps/boardwalks where applicable to minimise erosion. The pedestrian access tracks will be maximum width of 3m, wide enough to provide both safe public access whilst minimise actual footprint over the dune area.These tracks will also be utilise for emergency access,, with direct access to the north-south public road. Car parking will be restricted to the roads servicing the propsed development with dedicated parking bays adjacent pedestrian access point. The Sandy Beach North Developmentwill provide a cohesive network of pedestrian and cycle routes, with opportunities for improved access to the beach and coastal foreshore via controlled public access points. It is proposed for three access point to be provided to the beach and coastal foreshore.

These points of access will be formed as fenced corridors through the back beach dune that will be constructed in accordance with current Beach Protection Authority design practice (refer below).

Intrinsically, they will involve minimal disturbance to established coastal vegetation and will involve the retention of existing beach dune crest elevations. The pathways will provide new opportunities for controlled public access to the foreshore to the beaches of Sandy Beach to enable existing residents and visitors to enjoy the amenity it offers.

The restoration and ongoing management of the foreshore areas on the site as part of a mangement plan will be an ongoing process, which will be carried out in consultation with the Council and the local community.

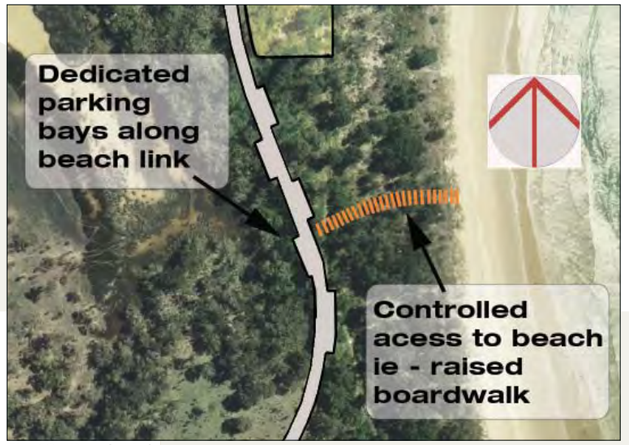


Fig 68 - Beach Link

Fig 69 - Controlled beach access

8.2 Dune and vegetation rehabilitation and management

Existing flora and fauna resources of thedune will be protected and their function maintained or improved through sensitive planning of the development and attention to Water Sensitive Urban Design . The usage of native vegetation within landscaping strategies will be maximised and natural processes on which ecosystems rely will be preserved.

Bushland rehabilitation programs and specifically the EBSF Management Plan are to be formulated in accordance with the Conservation Strategy for dune area(prepared by Conacher Travers) Strict weed eradication programs will be carried out in the dune areas to remove and prevent the re-emergence of weeds and pest plants

A community awareness program and signage will be implemented by the to encourage residents to respect and manage the area in accordance with agreed policies of the sensitive environmental protection area. This may include proscribed measures of responsible pet ownership (e.g. cats with collars and kept indoors after hours), as well as respecting revegetation areas and the negative consequences of dumping garden waste.

The revegetation program is proposed using seed sourced from local seed banks. The aim of these programs is to reinstate and conserve the indigenous vegetation and maintain biodiversity.

Revegetation adjacent to fire trails should be prepared in consultation with and Rural Fire Service (RFS).

Access to the Environmental Protection area should be formalised to certain access points to discourage incursion into regeneration and buffer areas. Fencing should be established prior to construction to prevent mechanical incursion into these areas. Fencing will also define boundaries for residents. Entrances to the Environmental Trust should provide access to well

The preparation and implementation of an Environmental Management Plan for the open space and conservation areas will be to ensure that open space and conservation areas are managed to best environmental practice.

Fig 70 & 71 - Controlled beach access treatments

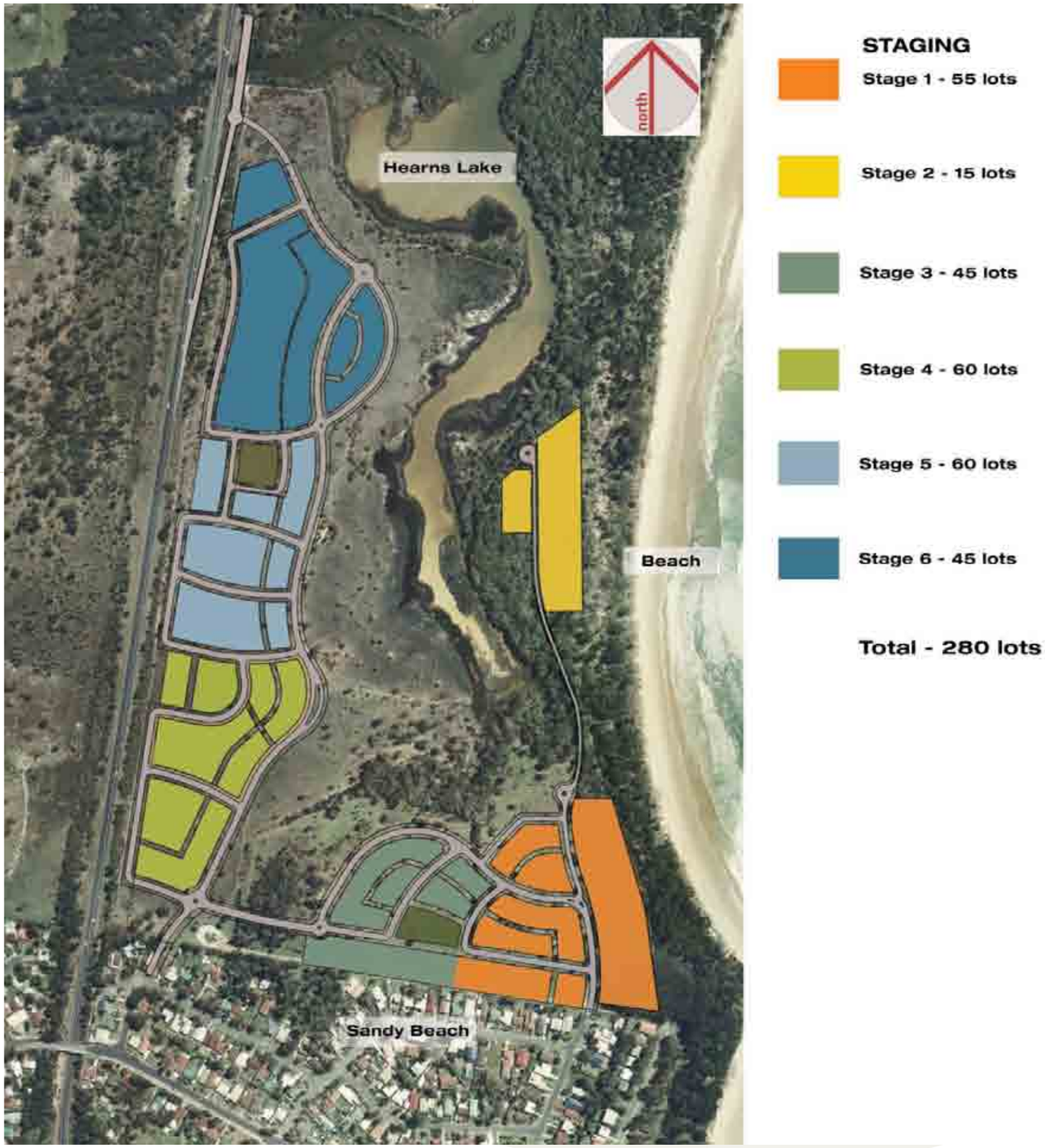


Fig 72 - Staging Strategy

9.0 Staging

9.1 Precincts

Once approval has been granted, it is proposed to stage the development over 5-6 years subject to market demand. It is envisaged to be developed in 6 stage. The indicative outline of the proposed staging is as follows:

Precinct	Year(s)
• Southern precinct - Stage 1	1-2
• Beach Precinct - Stage 2	1-2
• Southern precinct - Stages 3	2-3
• South Western precinct - Stages 4 and 5	4-5
• Northern precinct - Stage 6	5-6

The staging will be further developed during the DA process.

Prior to the commencement of each Stage a Construction Management Plan (CMP) will be prepared as part of the DA. The CMP will address all aspects of the construction for that stage including erosion control, stormwater management, noise mitigation, air quality, construction traffic, site safetyand any other matter relevant to the construction and its potential impact to residents and neighbours.

The construction process will use best industry practice to insure that any impact to neighbours is kept to a minimum and that consultation will take place prior to commencement of the work. Dilapidation surveys will be done on all adjoining properties and public property.

9.2 Staging Principles

The staging of the development will meet the following objectives:

To minimise inconvenience and amenity impacts on existing adjacent local community and on new residents from construction traffic and activities;

To complete environmental protection measures relating to each stage of development prior to any occupation;, eg re-vegetation, flood mitigation, WSUDs devices etc as early as possible; including works to 7(a) environmental zone to protect them during construction.

To coordinate development occupation with necessary major off-site services head-works augmentation, particularly storage and sewer treatment works capacities;

To provide core convenience retail and community support facilities as early as possible, and for the earliest possible extension of an existing local bus line services

To coordinate the establishment of landscape and planting to the public domain (parks, open space and streets) with progressive

Fig 73 - Stage 1 - 55 lots

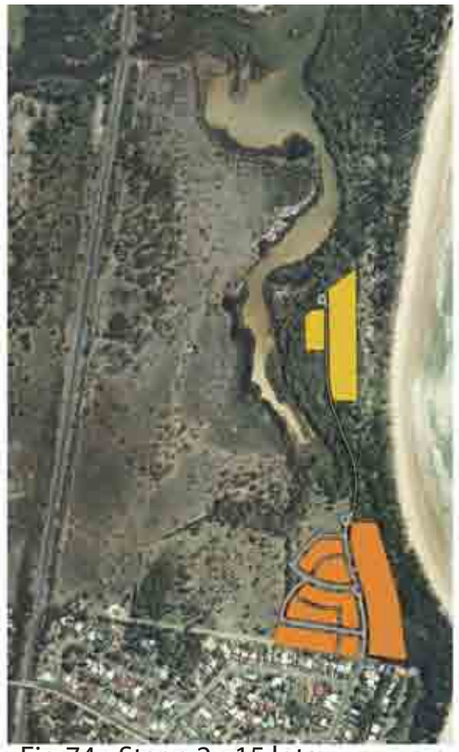


Fig 74 - Stage 2 - 15 lots

Fig 75 - Stage 3 - 45 lots

Fig 76 - Stage 4 - 60 lots

Fig 77 - Stage 5 - 60 lots

Fig 78 - Stage 6 - 45 lots

10.0 Community Title

10.1 Community title system

The project is committed to the long term quality of the open space. To ensure management of the public domain, and will establish an Community Trust to look after the site and ensure its long term health, viability and sustainability.

By adopting a Community Title system, residents will be able to determine the standard of maintenance of the open space and community facilities which provide the amenity and quality of their immediate environment, subject to minimum standards incorporated in the Community Management Statement.

In addition it will allow for the detailed and individual maintenance of environmentally sensitive land, which otherwise would become a burden for council. More importantly, Community Title, with its obligations, opportunities and openness, will encourage interaction, initiative and co-operation between householders for their mutual benefit . This should create a dynamic and organized community in social, economic and environmental terms.

The purpose of the Community Management Statement (CMS) is to set in motion a series of by-laws and other arrangements which will provide owners and occupiers with the best conditions possible for the enjoyment of their living style and the developer and statutory authorities with a level of certainty of outcome.

The Community Management Statement needs to be presented in a manner that does not create impediments to enjoyable living and therefore should present bylaws and other arrangements beneficial to a purchaser rather than detrimental. If this is achieved, it can be a positive benefit when marketing the development. It will also incorporate architectural and landscape standards that guarantee outcomes not only of the initial built forms but also future changes to these.

10.2 Community Involvement

The ongoing management and maintenance of Hearns lakes, the coastal zone and open space areas is critical for the integrity of the local environment and to ensure the local ecology is retained and enhanced. In order to encourage the long-term integrity of the Hearns Lake area the community needs to be supportive of the maintenance of this area. To encourage community participation awareness programs will be established through the community body to promote activities which will reduce weed invasion, and irresponsible pet ownership.

The long-term progress of the bush regeneration group should also be considered as results of regeneration efforts are not instantaneous or visible, which often decreases community participation as they are impatient to see results. Therefore encouraging social networking by involving the members and community in activities which promote awareness and encourage participation should be considered.The Applicant is committed to the long term quality of all open spaces and conservation areas. To ensure management of the public domain, the Applicant will establish an Environmental Trust within the community title system to ensure the long term provision of the care, health, viability and sustainability of the areas proposed to be developed as Environmental Protection areas and other types of conservation areas within the site.

The Environmental Trust will be funded by a percentage allocation from the sale of each lot to create a staable financial base and from the allocation of a proportion of community tilte levies on an annual basis. The amounts to be allocated to be determined during the next design stage.

The Applicant will be responsible for the design, construction and ongoing maintenance of all landscaping, open space and conservation areas within the development. By adopting a Community Title system, residents will be responsible for the standard of maintenance of the open space and community facilities which provide the amenity and quality of their immediate environment, subject to minimum standards incorporated in the Community Management Statement.

Additionally, it will allow for the detailed and individual maintenance of environmentally sensitive land, which otherwise would become a burden for the Council and for the Coffs Harbour Community at large. More importantly, Community Title, with its obligations, opportunities and openness, will encourage interaction, initiative and co-operation between householders for their mutual benefit. This should create a dynamic and organized community in social, economic and environmental terms.

Fig 80 - Typical landscape treatment to manage open space areas

Fig 79 - Management

Appendices

1 Layout

2 Landscape Details

3 Accessibility

Key

Potential Development Areas

Proposed Road Verges

1 Collector Road
2 Entry Road (s) from existing Sandy Beach
3 Pacific Highway
4 Long term access via future Woolgoolga interchange
5 Conservation Areas
6 Parks
7 Heritage site - ISF2
8 Heritage site - SBN1

0 50 100 200

Metres

1:2000 scale at A1

Layout

Appendix 1

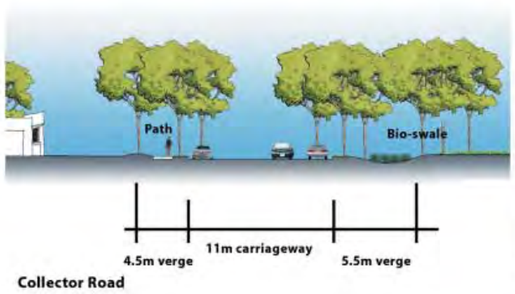
Road and areas of development configured around retention of significant vegetation stands

Edge roads to all open space to provide clear definition and which ensures ready access / egress should an emergency arise.

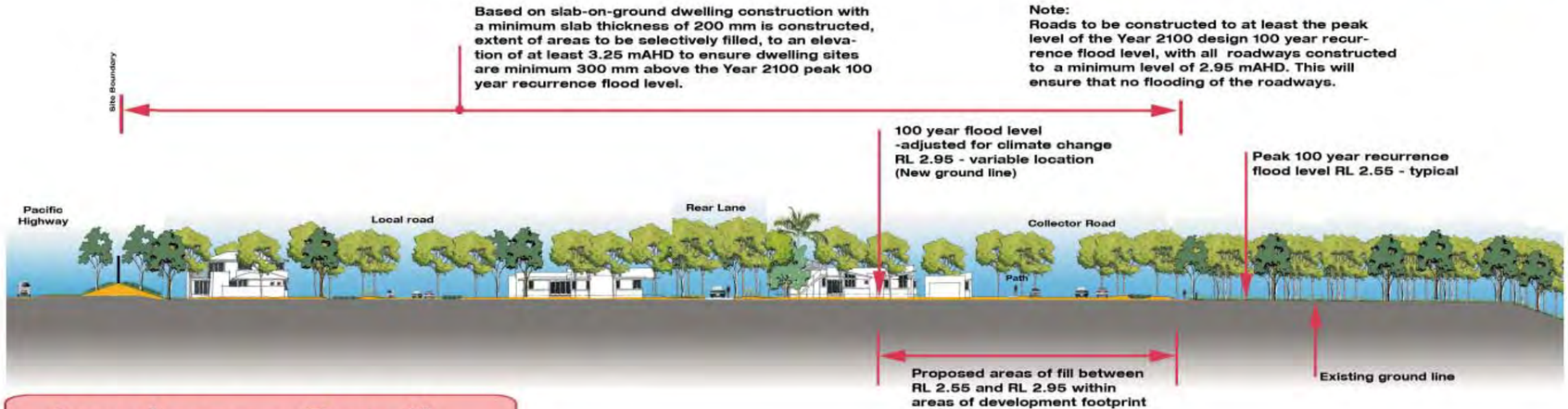
Rear lane access, providing flexibility in location of garages, and greater ability for solar access, as well as improving streetscape and creating continuous green verges incorporating longer runs of bio-swales

Pocket park for local use of residents

Medium density housing will address the park/open spaces, providing a high degree of definition and surveillance, as well as providing open space amenity for smaller dwellings.



Collector Road



Landscape Detail

Appendix 2

KEY

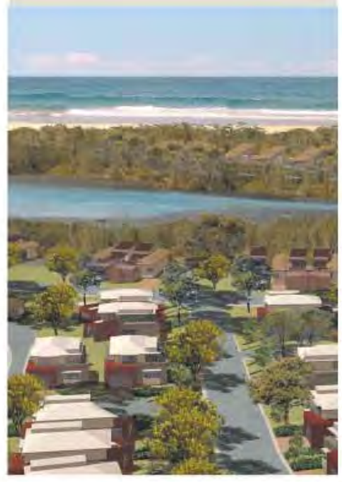
Proposed key pedestrian links

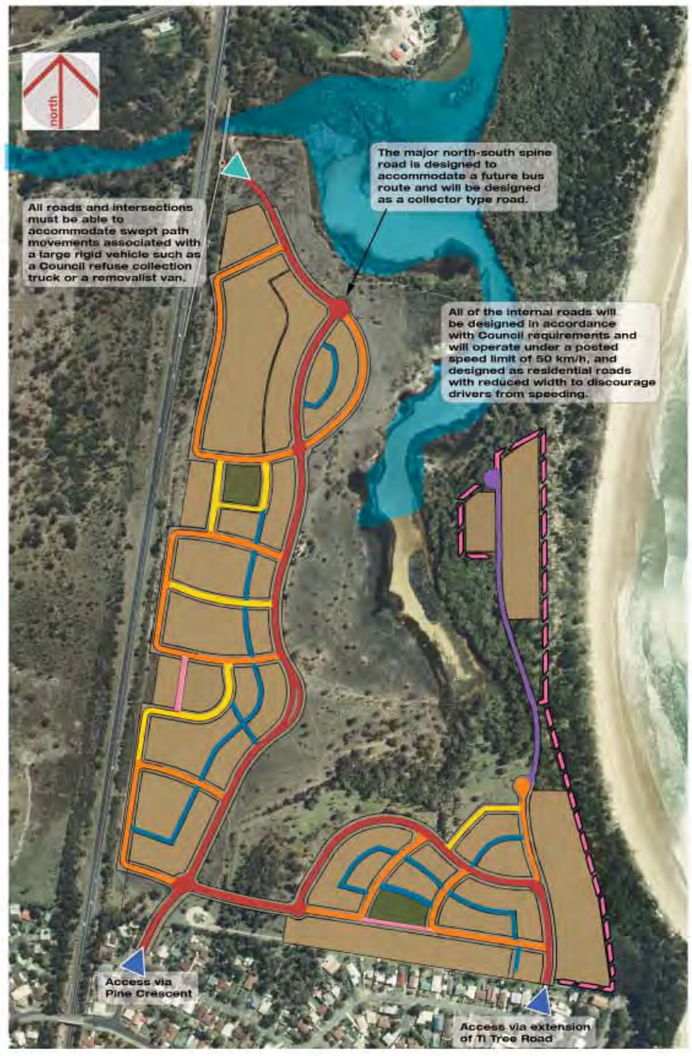
KEY

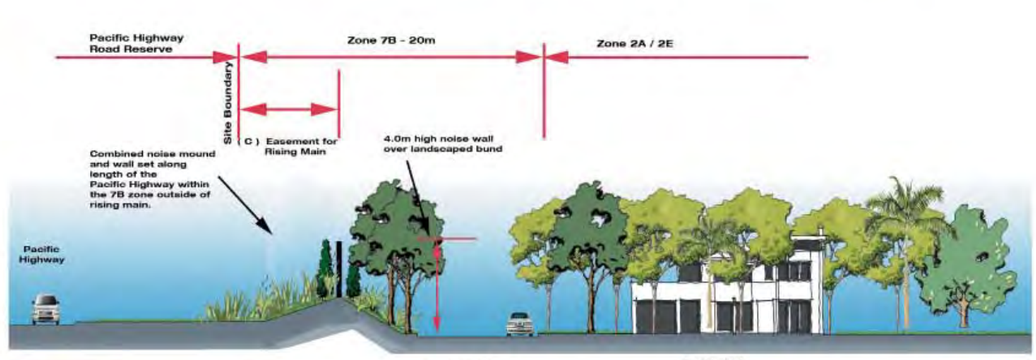
- Collector Road (potential bus route)
- Local Streets
- Minor Local Streets
- Mews
- Shareway
- Beach Link
- Bushfire Trail

Southern Entry Points (2) via Sandy Beach

Future Northern Entry Point via Woolgoolga Interchange







Generous verges with tree planting at alternate and regular centres, creating informal atmosphere, integrating with the natural environment

Accessibility

Appendix 3