

Summary Report

West Coast Drive Dual Use Path Upgrade / Landscape Improvements



1.0 Introduction

Cardno BSD was appointed by the City of Joondalup in September 2006 to commence a dual-use path upgrade study along West Coast Drive between the Sorrento Surf Lifesaving Club and Beach Road. The purpose of this study is to address a highly-valued and well-used segment of West Coast Drive that is in need of physical improvements. These improvements will help create a distinctive character for this stretch of dramatic natural coastline that begins to create a unique identity for coastal Joondalup.

Key issues that the study addresses include:

- The appropriate character of the streetscape improvements (including materials / permeability / style / height / lighting approaches) considering issues such as visual permeability, integration with the natural dunescape, utilising sustainable materials and construction practices, and compatibility with streetscape improvements north and south of the project area
- Opportunities for widening the dual-use path to increase functionality and safety for pedestrians and cyclists
- Assessment / constraints modelling of foreshore vegetation
- Location of key lookouts / gateways / beach access points and concept designs for upgrading those areas
- Urban design issues related to the connection between West Coast Drive and the neighbourhoods to the east

This study will assist the Council in determining whether or not to allocate funding to the construction of these improvements in the upcoming budget cycle. A public consultation process will be undertaken based on these concepts, seeking community feedback prior to proceeding into the budgeting and detailed design phase of the project. When completed, it is anticipated that these improvements will raise the regional profile of this stretch of coastline, increase user and local resident satisfaction and safety, and set a new benchmark in coastal streetscape projects.

This report is a summary of the work completed by the consultant team to date. The scope of the project includes a concept design for a new fencing profile that would run the entire length of the study area as well as identifying opportunities for widening the current dual use path. In addition, four 'Opportunity Sites' have been identified for additional landscape treatment to further enhance the corridor. The report presents the project background, then features a number of illustrations and descriptions of the proposed concepts for fencing and landscape feature areas. These concepts and illustrations will form the basis of future public consultation.



2.0 Site Description

The project site is approximately 1.8km long, running parallel with the Indian Ocean along West Coast Drive. The southern boundary of the project is at the intersection of Beach Road and West Coast Drive, which forms the municipal boundary between Stirling and Joondalup. The northern boundary of the project area essentially begins south of the Sorrento Surf Lifesaving Club, though a small segment north of the Club requires attention as well.

There are two main hills along this portion of West Coast Drive. The first, approaching from the south, rises slowly from Beach Road and crests just before Ozone Road. In this portion, the dual-use path deviates from the road alignment running further down the slope to minimise the climb for cyclists. This section is in particular need of attention as much of the vegetation is degraded and the segment lacks adequate lighting, making it a possible safety risk. Views from the top of the crest up toward Hillary's Boat Harbour are impressive. The second hill rises from the Angling Club to a crest just before Ross Avenue. An existing carpark at that location provides an opportunity for enhancing what is already a functional lookout. The steep, rocky terrain here makes for stunning scenery. From here, a long slope leads down to The Plaza mixed-use precinct and the fairly level terrain continues up past the Sorrento Beach Surf Lifesaving Club to Hillary's Boat Harbour.

The uses along this stretch of West Coast Drive are primarily single residential, with two significant exceptions. The Plaza, located in the northern third of the project area, is a node of retail along West Coast Drive that includes a bottle shop, a petrol station, and several restaurants. To the north of this site is the Sorrento Beach Resort, a short-stay tourism facility and further north is a retirement village. Up a slight hill from this commercial node (east) is Geneff Park and its Community Hall. Plans for further intensification of this area may include the development of additional multifamily dwellings, making this an activity focal point for the surrounding area.

The second non-residential node is the Marmion Angling and Aquatic Club (MAAC) located on the west side of West Coast Drive adjacent to Gull Street. The Club has two carparks (one north and one south) that are owned by Council, both of which are opportunity locations for further landscape features.

An additional opportunity location was identified by Councillors at the intersection of West Coast Drive and Beach Road. This intersection forms the southern boundary of the project and also the border between Joondalup and Stirling. It was felt that this location might be appropriate for some kind of gateway element to specifically define the coastal entry to the City of Joondalup.

The current dual use path is 4m at its widest and 2m at the narrowest point with an average width being 2.7m to 3m and the finish varies from red asphalt to grey concrete. Its condition varies from fair to poor – it is in need of repair in many places. The current fencing along the dual-use path is made of simple round pine posts with a similar round pine



Typical section of the dual use path along West Coast Drive.



'The Plaza' mixed-use precinct



The Marmion Amateur Angling Club

handrail connecting them. Simple, rural style wire mesh is stretched between the vertical posts. The post line is offset approximately 300mm from the dual-use path pavement, which allows a strip of vegetation to grow up between them. This configuration allows for the possibility of widening the dual-use path without shifting the fence line any closer to the coastline.

3.0 Environmental Investigations

It has been expressed by a number of Councillors that the natural environment is the key element that should inform design decisions in this project. The dunal environment along this part of the coastline is beautiful but fragile. A number of community groups have spent considerable time and effort replanting and restoring sections of the coastal vegetation. As part of our preliminary site investigations, a vegetation and flora survey was undertaken on the 14th December 2006 by two botanists from Cardno BSD. The site was traversed on foot from the Sorrento Life Saving Club in the north to the municipal boundary at Beach Road in the south. The vegetation was surveyed to map the plant communities of the dunes and limestone outcrops along the Sorrento and Marmion foreshores. A list of native and introduced plant species was also compiled.

The vegetation of the Sorrento and Marmion foreshores has previously been assessed for condition and weed presence in November 2001 by Ecoscape (Australia) Pty Ltd (2002) as part of a management plan for all foreshore areas in the City of Joondalup. This work found that much of the vegetation was in a poor or very poor condition along the Sorrento foreshore due to high disturbance levels. Areas of better condition were recorded along sections of the Marmion foreshore, but weed infestation was obvious in the southern sector.

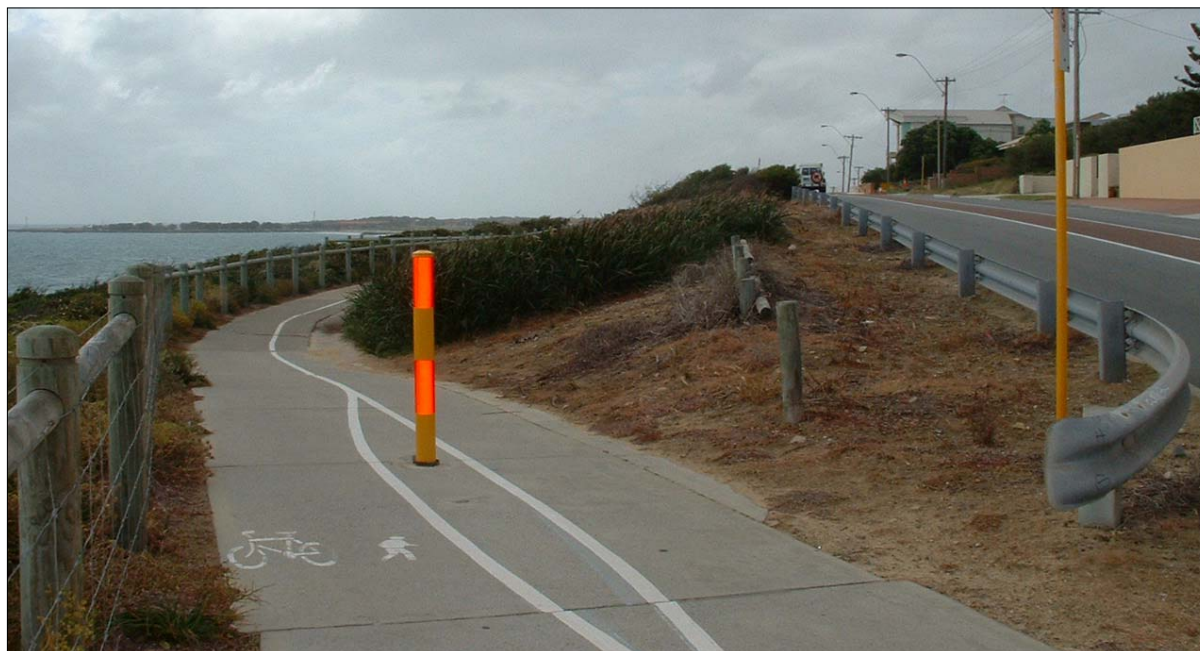
The purpose of the survey was to re-assess the condition of the vegetation of the Sorrento and Marmion foreshores, map the plant communities and define suitable management zones for the future rehabilitation of the vegetation. This information, in turn, assisted and informed the design process regarding opportunity areas for dual use path widening, landscape feature areas, and areas requiring attention to limit erosion or further invasion of weed species.

Vegetation condition of the Sorrento and Marmion foreshore has not deteriorated from that recorded in 2001 by Ecoscape (Australia) Pty Ltd and in some areas, has improved slightly. The vegetation along Sorrento Beach is generally still in "Poor" condition with native species composition between 40% and 50% and weed cover also between 40% and 50%. Small areas of *Acacia rostellifera* shrubland on the primary dunes are in a fair to good condition with the dense overstorey keeping weed presence low. Revegetation efforts were noticeable in the swales along this sector. However, there were still substantial infestations of weeds such as *Bromus diandrus* and *Trachyandra divaricata*.

Whilst patches of bare ground are still obvious in the area opposite Beach Road, the large blowout and erosional areas previously recorded



Typical section of dunal coastal vegetation along the dual use path.



Top of crest between MAAC and the Ross Avenue Lookout where DUP deviates from road.

appear to have been largely colonised by *Lepidosperma gladiatum* and *Pelargonium capitatum*. The vegetation on the sands above the exposed limestone cliffs is mostly in good condition with a high native species composition, although there were significant areas of bare ground in the *Lepidosperma gladiatum* heath.

A significant presence of priority weed species was recorded during the survey. Priority weed species are those that possess one or more of three attributes: are widely distributed, are highly invasive or have the ability to change the structure, composition and function of an ecosystem (CALM, 1999). The main weeds observed along the Sorrento and Marmion foreshores were *Pelargonium capitatum*, *Bromus diandrus*, *Trachyandra divaricata* and *Tetragonia decumbens*.

The investigations undertaken to date have primarily focused on the diversity of plants situated within the foreshore area, the nature of extent of vegetation communities, and the broad level condition of the areas using an established vegetation condition scale used previously for a wider section of coast that included the area in question. This has been seen as an important input into the overall foreshore interface concept development process to ensure that flora/vegetation diversity and conditions issues can be reflected in the design process.

Preliminary discussions with a number of representatives of the City of Joondalup have highlighted the importance of addressing the long-term management of the foreshore area and that this is integral to any works program that may be instigated to address the foreshore/road/residential interface.

Ideally a foreshore management plan should be developed and presented as part of the overall interface works plan and program, and will need to provide a more specific action list for the necessary works to maintain the values and integrity of the foreshore. Ideally this will need to accommodate:

- Dune stabilisation
- Weed control
- Access control
- Revegetation
- Ongoing monitoring and maintenance

In addition to the above there are opportunities to include interpretive signage, integration of the above with existing foreshore works by community groups and maximising the amenity values of the foreshore through the use of lookouts and other user facilities within the foreshore.



Heading south up the hill from the MAAC.



Typical section of the current dual use path fencing and its relationship with the adjacent dunes and vegetation.

4.0 Fencing / Dual Use Path Design

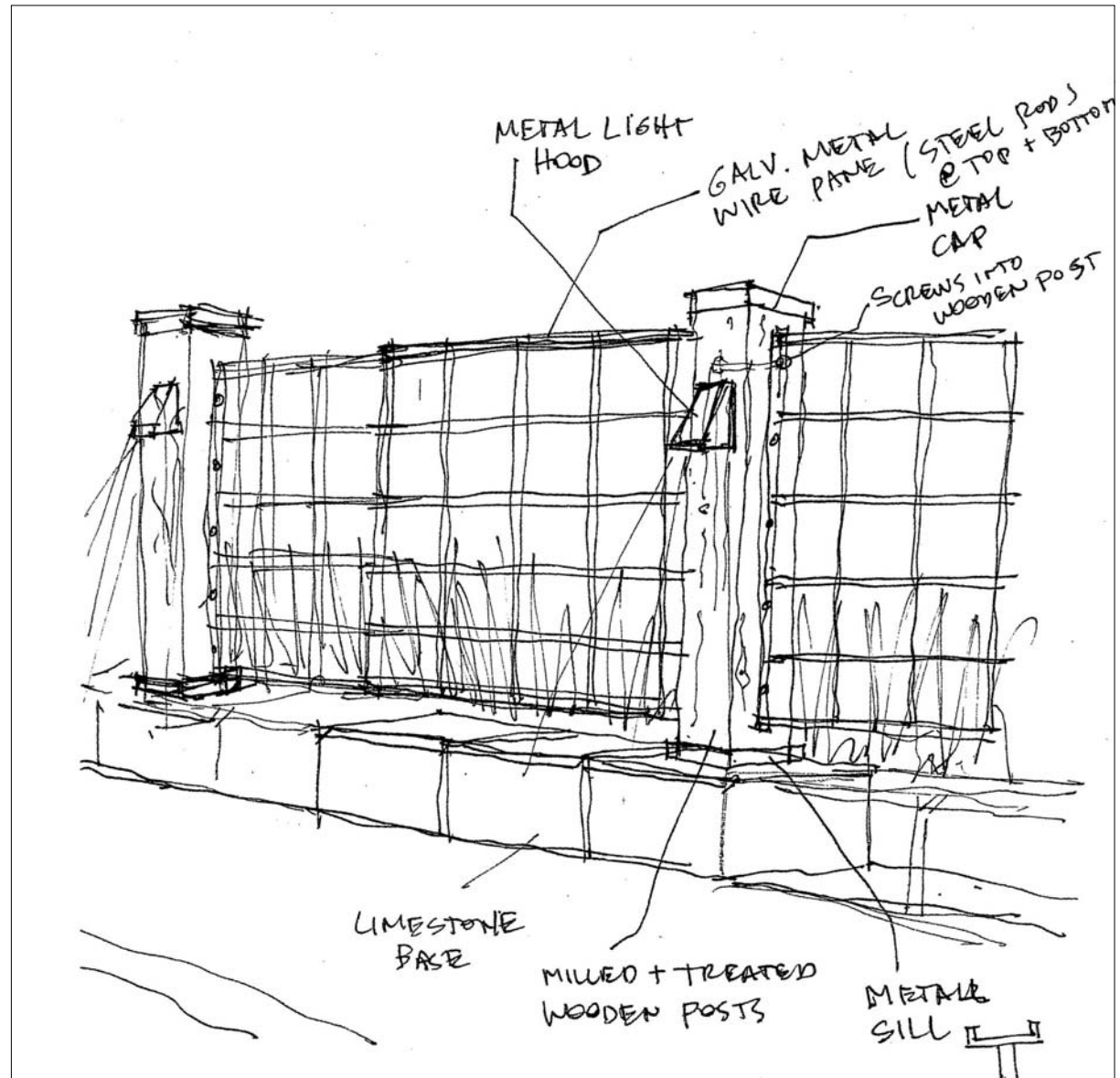
4.1 Initial Ideas

On October 12th 2006, Council staff organised a bus tour of the site with Councillors and the Consultant team. The bus stopped at various points for the tour participants to get out and explore the site. This varied and informal format allowed for a range of issues to arise and a vigorous discussion / debate to begin.

The key ideas from the bus tour included:

- Concept should be compatible with existing improvements north and south but should particularly emphasise the natural beauty of the coastline
- Employ materials that have an obvious 'natural' aesthetic, high quality, preserve visual permeability, and promote sustainability
- Consultant team will work closely with Joondalup Coastal Care to identify areas along coastline to maintain / enhance plantings
- Suggest areas for revegetation with native species / additional plantings
- Primary gateway opportunity at Beach Road
- Consideration of other nodes for outlooks / special treatment at Marmion Angling Club (north and south), carpark opposite Ross Street, and opposite 'The Plaza'
- Current conflict between pedestrians and cyclists – path should be widened where possible but not at the expense of the local dunes
- Edge treatment to be considered between DUP and planting – possibly a ½ height limestone block or kerb to assist in keeping the path tidy from blowing sand and encroaching vegetation
- Fencing should promote visual permeability. Wood is preferred because of its natural aesthetic to blend with vegetation. Durability and understated appearance to be primary considerations.
- Lighting should be integral to the design and should avoid light pollution blocking views.
- Signage should be consistent and integrated with other design elements
- A number of medians could be enhanced through plantings and further landscaping
- Accessibility to viewing areas should be improved, allowing for use by a broad section of the community (not just the very active)

While there was certainly agreement on many of the items, it should also be noted that there was considerable discussion and not all Councillors entirely agreed with the above bullet points. However, this summarises the majority view of the key issues that needed to be taken into account in formulating the design concept.



Initial rough concept sketch for fencing design.

4.2 Concept Design

The initial design idea resulted from extensive site investigations and initial feedback from Council staff and Councillors on the bus tour. The design team felt that a solid, low kerb would assist in preventing the blowing sand and creeping vegetation from crossing over into the dual use path. It also helped to give a strong base to the posts and wire above without blocking views. The kerbing was originally envisioned to be made from limestone blocks, however, it was decided after discussion with Council that poured concrete with limestone aggregate would achieve a similar aesthetic effect but would be more durable and cost effective.

Recycled Jarrah timber posts were chosen for their 'natural' appearance and their cost compared to other materials such as metal and concrete. The milled, square shape was chosen as it echoed the form of the limestone blocks and also provided a point of departure from the standard round pine bollards used in many parks around Perth. Spaced between the timber posts are thin steel posts which assist in providing visual diversity and also serve as a better material to secure the various fixings (avoiding the cracking and strain that occurs in wooden posts over time).



Existing condition of the dual use path.



Proposed fencing design and widened dual use path.

The timber posts sit in cast aluminium seats that are in turn anchored into the limestone base for stability. A cast aluminium cap prevents moisture from collecting and seeping into the posts through the end grain, a particularly vulnerable location. The metal caps also allow for the integration of similar style educational signage to be incorporated into the fencing design at appropriate locations.

The aluminium seat and capping helps to give the design proposal a subtle style and sophistication without being overbearing and drawing attention away from the view of the natural coastline. Simple bollard lighting is integrated into the design of the post, with the light covered and screened by a simple folded metal hood. This hood protects it from the weather but also directs the light directly onto the path, reducing potential light pollution and maintaining optimum views for residents across the street.

A rolled galvanized steel handrail spans between the posts, providing rigidity and also something to lean on should users decide to stop and admire the view. Below the steel handrail are evenly spaced horizontal steel wires. These wires prevent users and domestic animals from penetrating the natural vegetation and causing damage to the dunal landscape.

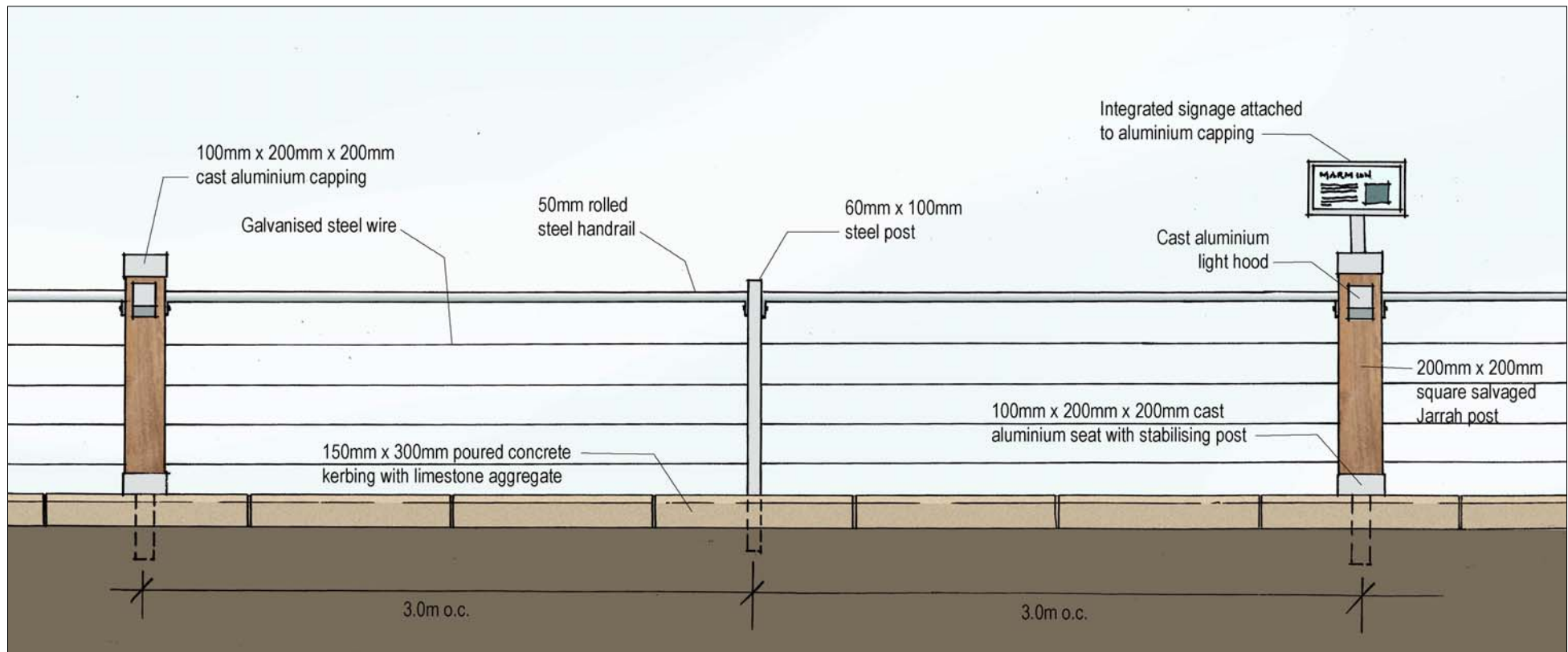
The dual use path itself will be resurfaced with red asphalt and widened where possible.



Existing condition of dual use path across from 'The Plaza'.



Proposed fencing design and improved dual use path showing relationship to dunes and adjacent vegetation.



Detailed proposed fencing elevation along with sizes of components and fixings.



5.0 Opportunity Sites

The 'Opportunity Sites' represent special locations along the linear study area that hold particular promise of becoming community focal points. They have been chosen for a variety of reasons and all have different attributes that we have tried to enhance through our proposed design interventions.

Two broad approaches came out of the design process aimed at pulling together the separate parts of the project so that it is identifiable as a discrete 'precinct'. The first approach is to use common materials in different ways in each location. Inspired by the fence design and materials, these 'Opportunity Sites' use a common architectural 'language' of limestone walls, timber benches and decking, and metal fixings. This visual theme reinforces the connection between the landscaped areas and also with the new fencing along the dual use path.

The second approach is what we've termed 'Vertical Sculptural Markers' (VSM). Vertical Sculptural Markers are as yet indeterminate vertical pieces of public art / sculpture that have some functional aspect and possibly some connection with each other that can be located at the key 'Opportunity Sites' to reinforce the idea of the study area as a discrete and identifiable district in its own right. It is proposed that these VSM be designed by local artists / sculptors to inspire and dazzle the local residents and users of the dual use path, perhaps based on a nautical or a local historical theme. The careful placement of the VSM's at Beach Road, the MAAC, the Ross Avenue Lookout, and The Plaza add further importance to those landscape features and essentially identify the boundaries of the study area. In this way, the placement of the VSM help to tie the various parts of the project together, creating a sum that is more powerful than its parts.

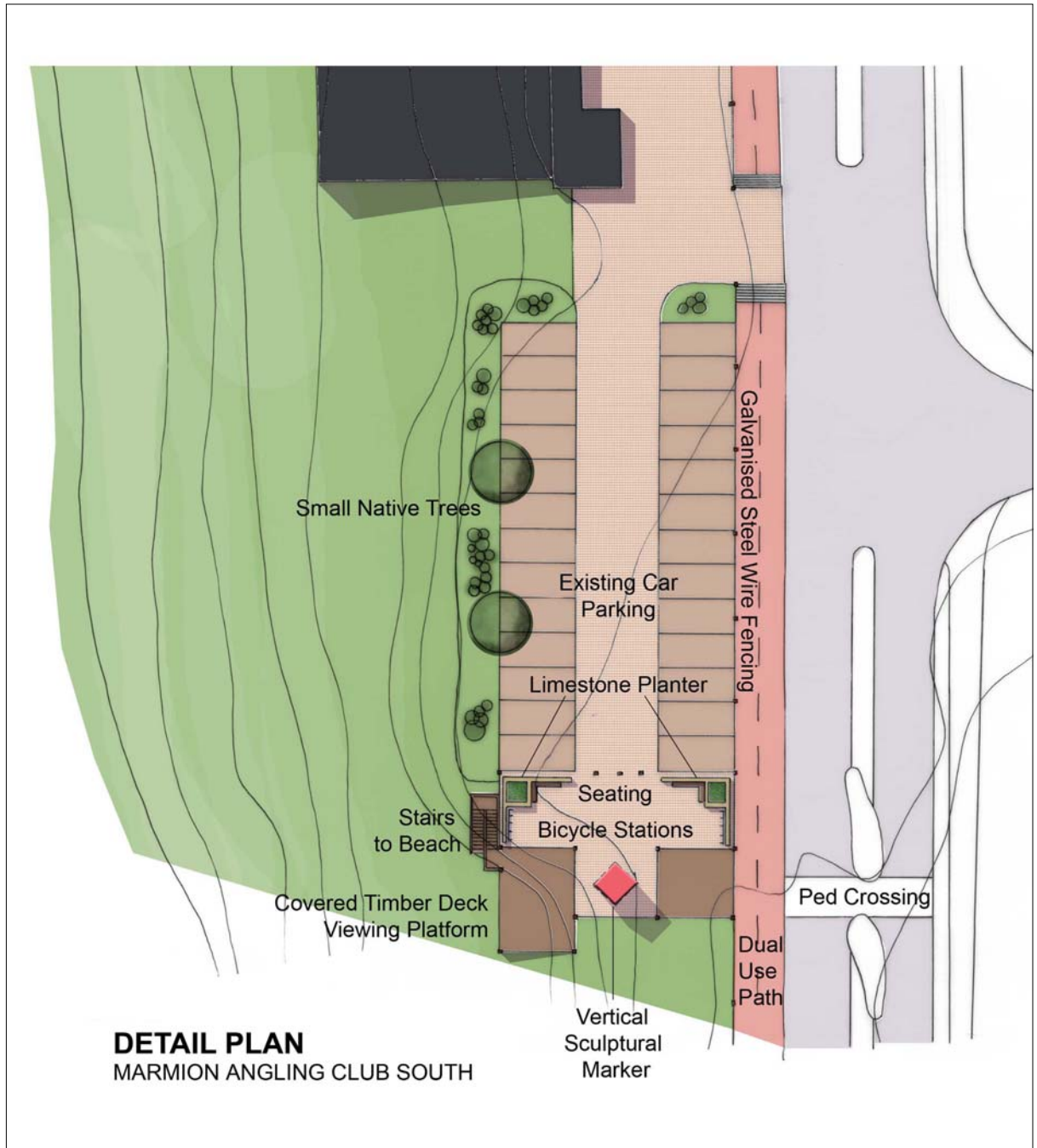
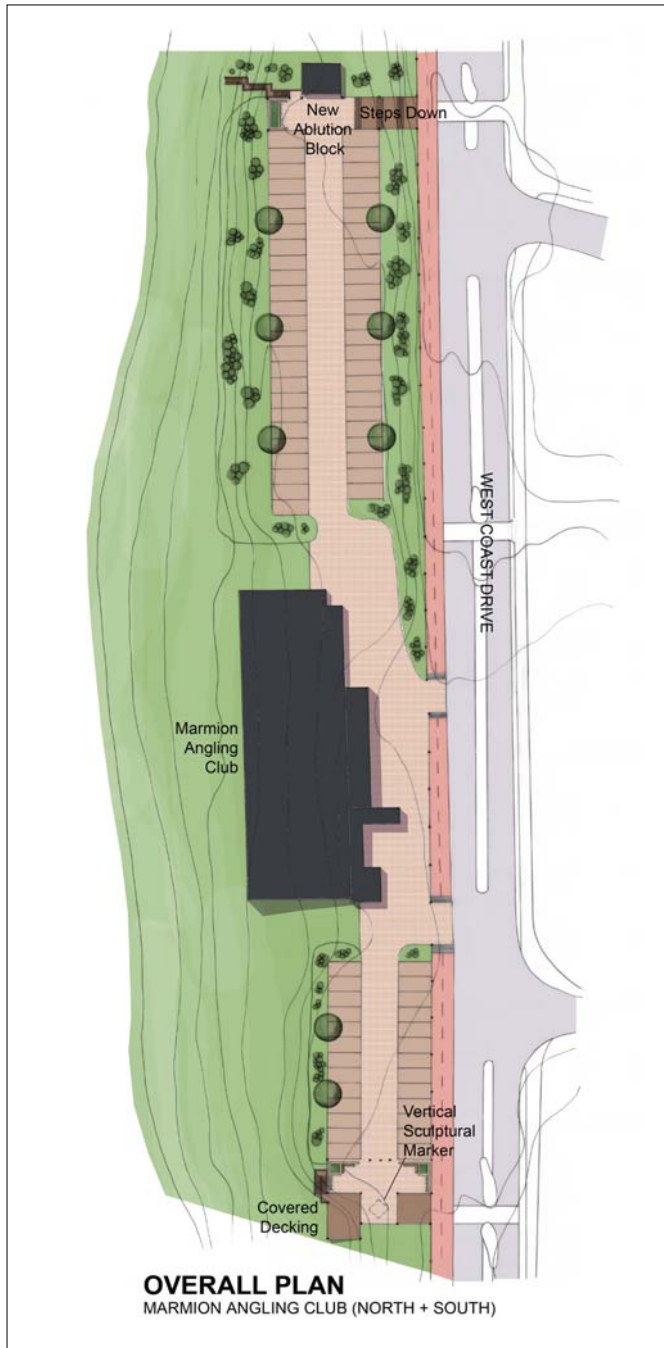
5.1 Beach Road

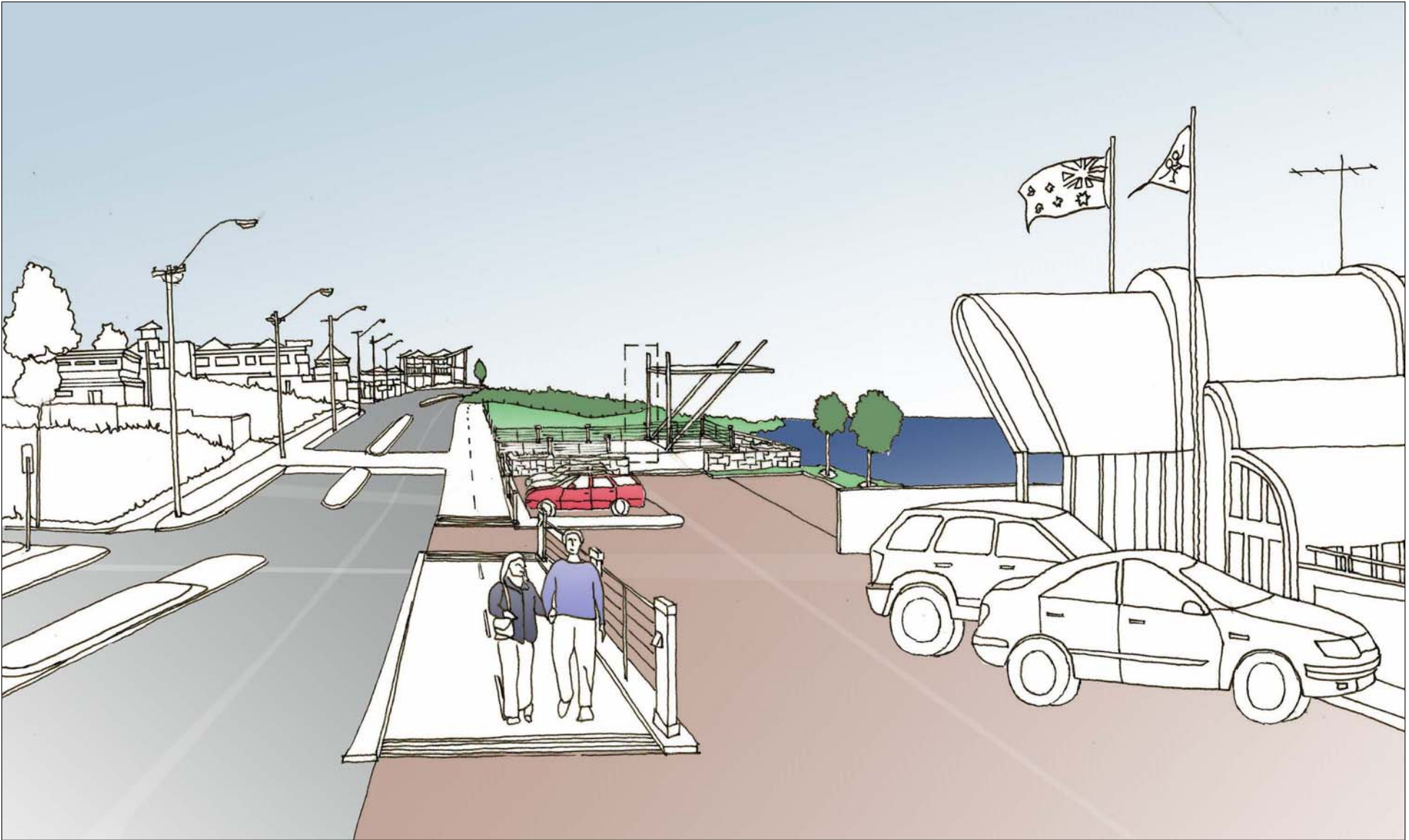
The intersection of West Coast Drive and Beach Road forms the City of Joondalup's southern boundary with the City of Stirling and is the first 'Opportunity Site' serviced by the section of Dual Use Path to be upgraded. A viewing platform and seating are already provided at this location and therefore the provision of additional infrastructure is not necessary. However, in an effort to announce the entry into the study area from the south, the first 'Vertical Sculptural Marker' will be located at this point (see perspective drawing on previous page).

5.2 Marmion Amateur Angling Club (MAAC)

Travelling north from Beach Road, the MAAC is the second 'Opportunity Site'. The MAAC is serviced by two (2) public car parks. It is intended to brick pave the existing car parking area and resurface the bays in red asphalt. Additionally, the rationalisation of the entrance to the southern car park will facilitate the construction of a further four (4) car parking bays. Several small trees will also be located on the western side of each car parking area in an attempt to visually soften the area. The species of tree will be sympathetic to the existing natural vegetation and due to the topography of the area falling in a westerly direction, the trees will not compromise any views currently enjoyed by residents of West Coast Drive.







Artists impression of the proposed landscape improvements at the MAAC.

The 'Vertical Sculptural Marker' is to be located at the southern end of the south car park. In addition, this location will be provided with a wooden deck viewing platform (including lightweight flat roof) and limestone planters housing native dunal vegetation with integrated seating, bicycle stations and bins. The right-angled configuration of these common architectural elements is influenced by the angular geometry of each car parking area. The Water Corporation will soon begin construction of a pump station adjacent to the existing abluion block and this provides an opportunity to situate the viewing platform directly above the pump station and minimise any visual or environmental impact.

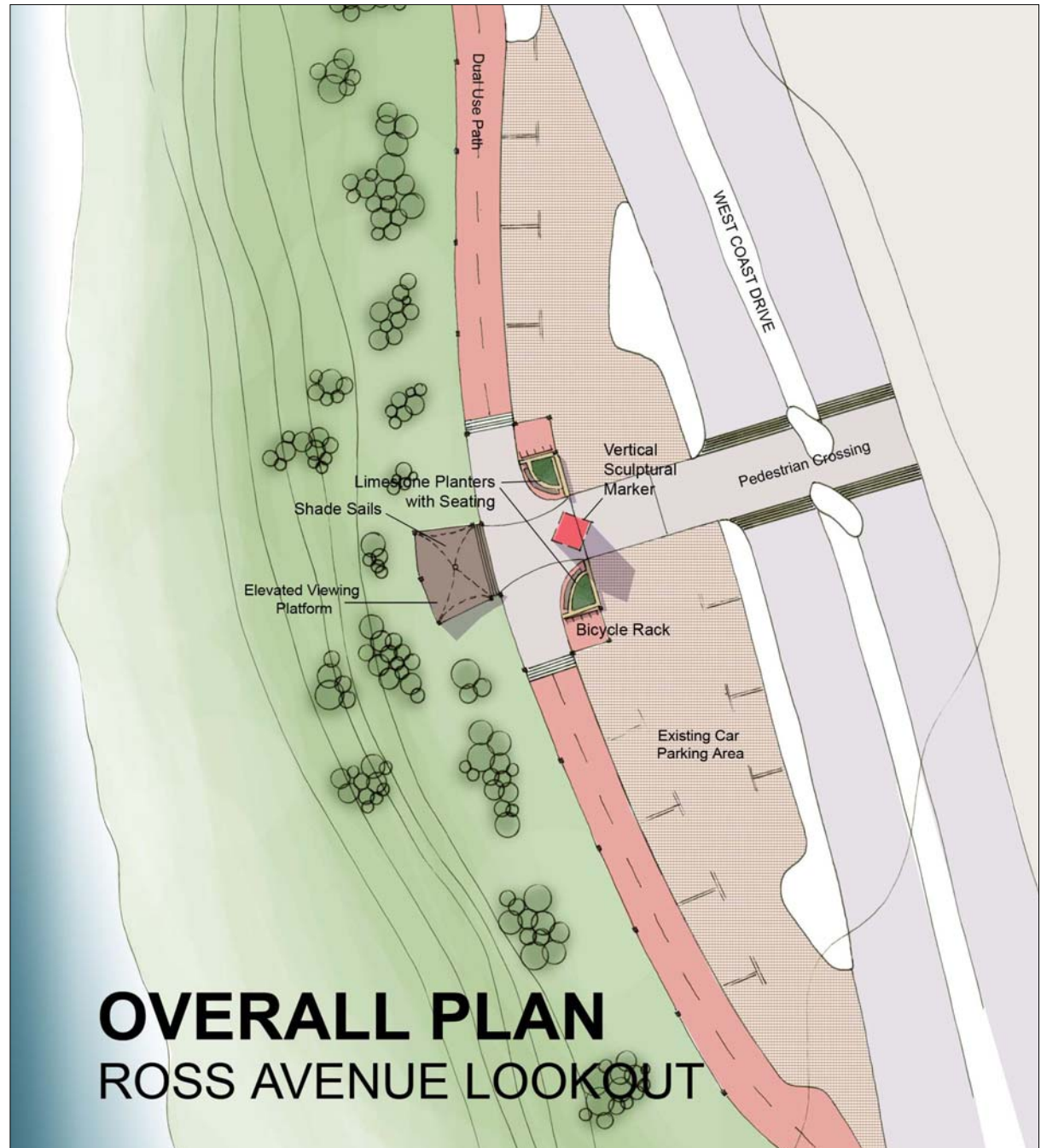
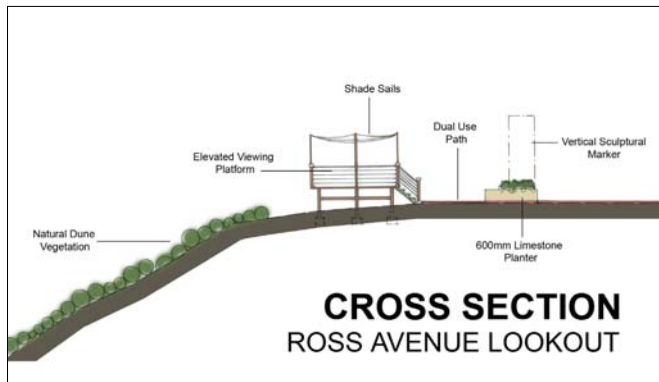
It is proposed to relocate the existing abluion block to the end of the north car park, however, pedestrian access to the beach from the south car park will be maintained. In addition to housing the abluion block, the north car park re-interprets the common architectural elements of the limestone planters with integrated seating, bicycle stations and bins. Direct pedestrian access is provided to both the Dual Use Path and the beach.

5.3 Ross Avenue Outlook

The location of the third 'Opportunity Site' is within the modest car park at Ross Avenue. Two visual themes have been identified at this opportunity site. The first is the curve of the car park and the second is the symmetry generated by the 'Opportunity Site' being situated in the middle of this curve.

The shape of the car park has directly informed the configuration of the common architectural elements at this place and the limestone planters with integrated seating are subsequently curved. Shade sails have been used as a lightweight roofing structure to minimise any impact on existing views of the ocean. Additionally, the curved shape of the shade sails facilitates the continuation of the dominant visual theme of this site. Of equal importance is the symmetrical arrangement of each architectural element at this 'Opportunity Site'.

Finally the viewing platform has been slightly elevated to accentuate the visual effect afforded by the natural topography of the area without compromising the integrity of the existing sightlines to the west.





Artists impression of the proposed landscape improvements at the Ross Avenue Lookout.

5.4 The Plaza

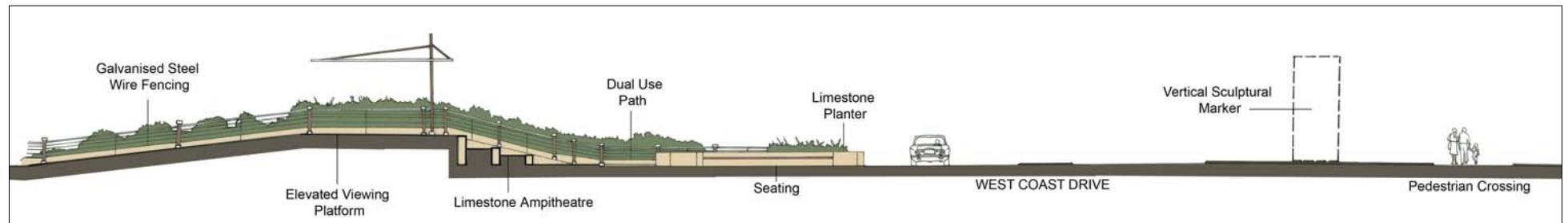
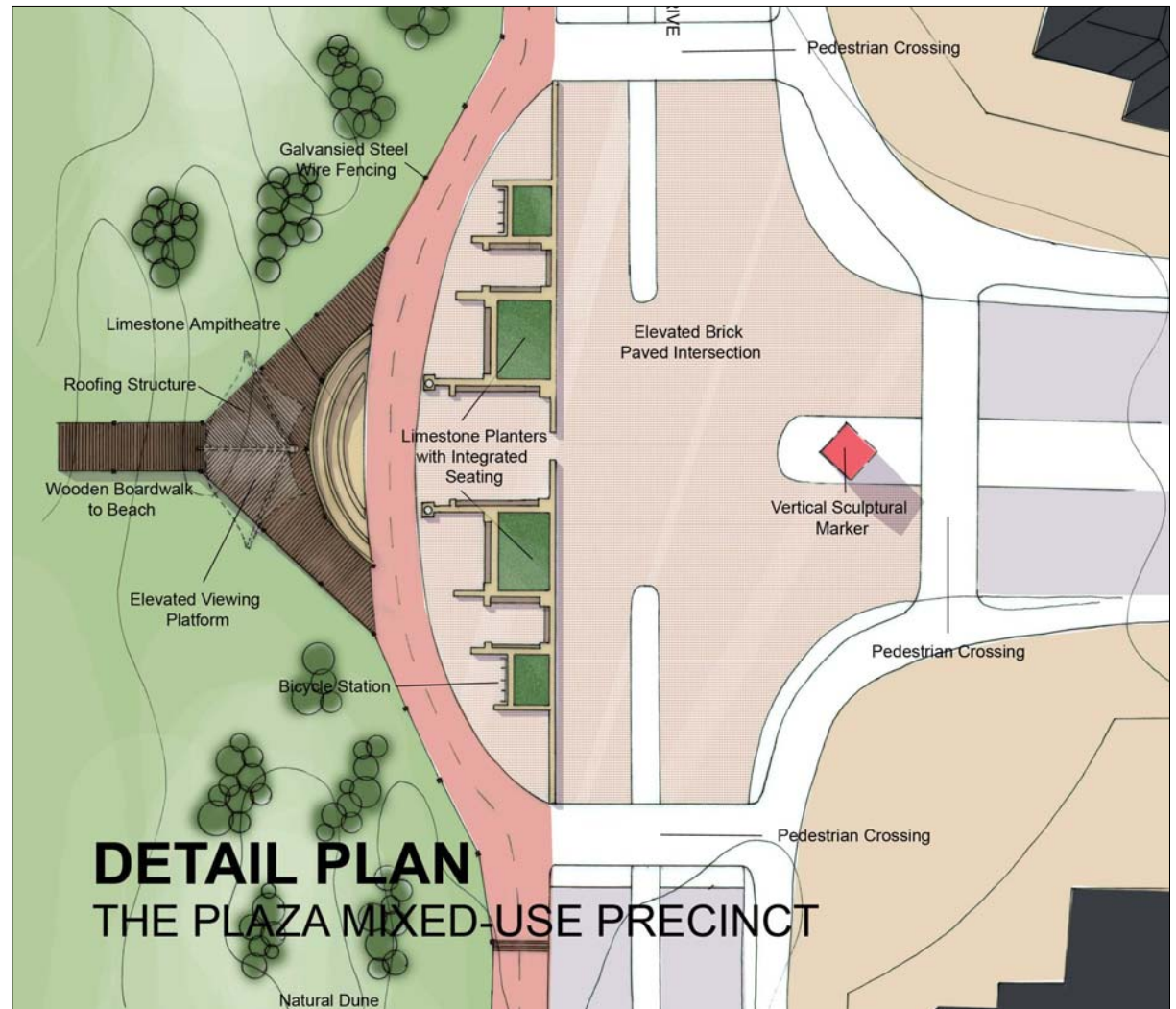
The final 'Opportunity Site' is located at the intersection of The Plaza and West Coast Drive. This site is unique in that the infrastructure that makes this place noteworthy is located on the eastern side of West Coast Drive.

The intention of the design at this 'Opportunity Site' has been to 'pull' the location together by including both sides of West Coast Drive in the concept. This has been achieved by:

- Situating the 'Vertical Sculptural Marker' on the eastern side of West Coast Drive
- Reconfiguring and rationalising the corners of the intersection
- Introducing formal pedestrian crossings in both an east-west and north-south direction
- The use of a raised brick paved platform within the traffic intersection and continuing the paving into the landscaped area

The Plaza also proposes a wooden deck viewing platform (with lightweight roofing structure) located at a slight break in the line of two larger sand dunes. By taking advantage of the natural topography of the site, views of the ocean are achieved without causing a detrimental impact to the natural environment. Furthermore, due to the vista created by The Plaza, the location of Public Open Space to the east and the natural topography of the dunal system, the viewing platform does not obstruct any sightlines to the ocean. Ramp access up to the viewing platform allows both able bodied and those in wheelchairs to take in the magnificent ocean views.

The eastern side of the sand dune has been used as a small limestone amphitheatre that has an interface with the architectural elements of limestone planters with integrated seating, bicycle stations and bins that are common to each 'Opportunity Site'. Like the Ross Avenue Car Park, the configuration of these architectural elements is symmetrical.



6.0 Cost Estimates

As part of the design and consultation process, Cardno BSD was asked to provide some preliminary cost estimates for the entire design proposal. The consultant team worked with a local landscape supplier to determine a cost of the typical fencing section. This was then simply multiplied by the approximate length of the study area. Similarly, advice was obtained from Cardno BSD civil engineers on typical costs for common materials and labor to cover construction of the 'Opportunity Sites'. In addition to the standard elements, this included allowances for shade structures, VSM's, a new ablutions block, and some soft landscaping. In total, the preliminary cost estimate for the project came to approximately \$3.8million. Allowing for a cost escalation rate of 12%, this brings the total estimated budget to approximately \$4.25million.

7.0 Next Steps

While a fair amount of work has so far gone into the project, there is still much to do. The next step is to begin the formal community consultation process. This process will include (but is not limited to) a community open night at a location near the site, meetings with specific interest groups, postings of drawings at the Council Administrative Building and in other prominent locations around Joondalup, and posting information about the project on the Council website. It is anticipated that the consultant team will receive a number of comments from interested parties that will inform the next steps of the project.

Once the community consultation process is complete, the input will be compiled and presented to Council for comment. Council will then direct the design team regarding any necessary changes to the design that came from the community input. If Council is still supportive at that stage of progressing the project, the consultant team will move forward with detailed design and eventually construction of this exciting project.

West Coast Drive DUP - Preliminary Cost Estimates	
Dual Use Path and Fencing	
	<i>Cost Per Linear Metre</i>
Typical Fence Section	Jarrah + Steel Post Option
200x200x1000mm recycled Jarrah posts (\$120 each)	\$ 20.00
60x100x1000mm steel posts (approx \$40 each)	\$ 6.66
Fixings	\$ 156.34
Construction (50% of materials cost)	\$ 91.50
Lighting	
Lighting hardware and bulb (allowance) (\$500 per fixture every 6 metres)	\$ 83.33
Trenching and cabling (\$800 per fixture every 6 meters)	\$ 133.00
Paving	
150mm x 300mm concrete kerbing	\$ 143.00
2.75m wide asphalt DUP	\$ 56.03
Construction (50% of materials cost)	\$ 100.00
Total Cost Per Linear Metre	\$ 789.86
Total DUP Cost	\$ 1,740,000.00
Opportunity Sites	
	<i>Cost Per Square Metre</i>
Hardscape Areas Include	
Decorative paving	\$ 70.00
Retaining Walls	\$ 112.00
Walls / Steps	\$ 15.00
Seating (\$1500 per seat, one seat per 100m2)	\$ 15.00
Special Lighting (\$1400 per lamp pole, one per 200m2)	\$ 7.00
Shading Structures (each)	\$ 50,000.00
Vertical Sculptural Markers (each)	\$ 25,000.00
	Total Cost
Area of Interest	
The Plaza	\$ 282,253.33
Ross Avenue Lookout	\$ 135,640.00
Marmion Angling Club	\$ 382,868.33
Beach Road Gateway	\$ 43,050.00
Soft Landscaping	
Plantings and shrubbery (allowance)	\$ 400,000.00
Installation (allowance)	\$ 200,000.00
Total Opportunity Sites Cost	\$ 1,450,000.00
Miscellaneous Items	
Public Ablution Block (north MAAC Carpark)	\$ 340,000.00
Public Consultation	\$ 50,000.00
Total Miscellaneous Items	\$ 390,000.00
Detail Design Costs	
Civil Engineering (7%)	\$ 180,000.00
Structural Engineering (7%)	\$ 13,000.00
Landscape Architecture (5%)	\$ 20,000.00
Total Detail Design Costs	\$ 213,000.00
Overall Cost Estimate	\$ 3,793,000.00
Cost Escalation Factor (12%)	\$ 455,160.00
Adjusted Overall Cost Estimate	\$ 4,248,160.00