



Leighton Oceanside Parklands

Masterplan Report (July 2007)



Executive Summary

The Leighton Regional Planning Guidelines, released in 2000, established the broad planning objectives for the railway marshalling yards site and identified the four-hectare residential site and the remaining area to be set aside for public parkland purposes. The Western Australian Planning Commission (WAPC), through LandCorp as project manager, appointed Blackwell & Associates to document the draft landscape masterplan and Estill and Associates to facilitate the community consultation process. A key project objective was to prepare a draft landscape masterplan incorporating an appropriate level of community consultation.

The public consultation process began with a public forum held on 21 May 2005 at which a collective vision for the Leighton Oceanside Parklands was established. From the public forum a Community Stakeholder Reference Group (*Appendix 1*) comprising some 20 participants, was formed providing further detailed input.

A government appointed Steering Committee (*Appendix 1*) was also formed to oversee the whole process. This committee included members from the Department of Planning & Infrastructure (DPI), LandCorp, Town of Cottesloe, Town of Mosman Park, City of Fremantle and four local community representatives.

The community's vision is for: "a safe regional beachside park that incorporates principles of sustainability and caters for a diversity of users by providing appropriate facilities to meet their needs".

Through a series of public consultation meetings with the Community Stakeholder Reference Group a draft landscape masterplan was progressively developed and tested until a preferred option was agreed upon.

This option was endorsed by the Steering Committee and advertised with an explanatory report in October/November 2006 to seek full public comment.

The feedback from the advertised draft masterplan was overwhelmingly positive with approximately 200 responses being received (169 individual responses, 1 petition with 57 signatories and 88 pro-forma letters). Detailed comments focused predominantly

upon the need to construct the northern section of Curtin Avenue to expedite the development of the whole park and concerns about the impact upon the Motessori Beehive School's plans particularly in relation to the alternative option also advertised whereby Port Beach Road was to be re-routed at the northern end between the School and the McCall Centre. Concern was also raised by a number of respondents about water usage and the extent of turf grass.

Based on the results of the detailed feedback minor modifications were made to the draft masterplan and this amended masterplan was presented to the Steering Committee together with a summary of the public consultation feedback from the advertised draft masterplan. The modifications made to the draft masterplan focused on reducing the extent of turf grass areas, plus revising the wording in relation to how the northern node design is to be progressed. All of the other main issues raised through the advertising process are already addressed in the masterplan. This amended masterplan was endorsed by the Steering Committee in June 2007.

The landscape masterplan (*Figure 1*) concentrates public amenity and recreational facilities in three distinct areas referred to as the Southern Node, Central Node and Northern Node. It also proposes the rehabilitation of the balance of the marshalling yards, proposes a new beach access road and suggests the construction of the Curtin Avenue extension to the east of the marshalling yards to enhance the safety of pedestrians, motorists and cyclists accessing the beach and foreshore areas.

The development of the landscape masterplan will occur in stages over a period of time as funds become available (*Figure 8*). Funding is currently available to implement stage one. The implementation of stage one works is seen as a priority. The breakdown of stages and costs for the development of the draft landscape masterplan is outlined in *Table 1* and *Table 2*. The estimated total probable cost of the development is approximately \$30 million excluding GST.

The project area falls within the City of Fremantle, Town of Mosman Park and the Town of Cottesloe. The long-term management and maintenance of the parklands remains an ongoing issue that is yet to be resolved.

The consultant team believes that the landscape masterplan represents an achievable outcome for the site. However, it is recognised that additional investigations and design development is required to prepare final design outcomes and to resolve any issues which are beyond the scope of this brief. In particular it is recommended that the design development of the Northern Node should involve further public consultation.

The development of the Leighton Oceanside Parklands masterplan will provide the public of Western Australia with a significant new beachside parkland area and tourist attraction.

Description	Total (excl. GST)
Roadworks & car parks (excluding Curtin Avenue)	\$2,725,335
Curtin Avenue (2 lanes)	\$7,860,000
Buildings	\$240,000
Landscape Works (excluding maintenance)	\$19,243,444

This OPC does not include for any eradication of rabbits, services, artwork, upgrade to McCall Centre, upgrade to Vlamingh Memorial, upgrade to Fremantle SLSC (incl. cafe/restaurant), aboriginal monitoring, footbridge modifications/upgrade, or any site remediation.

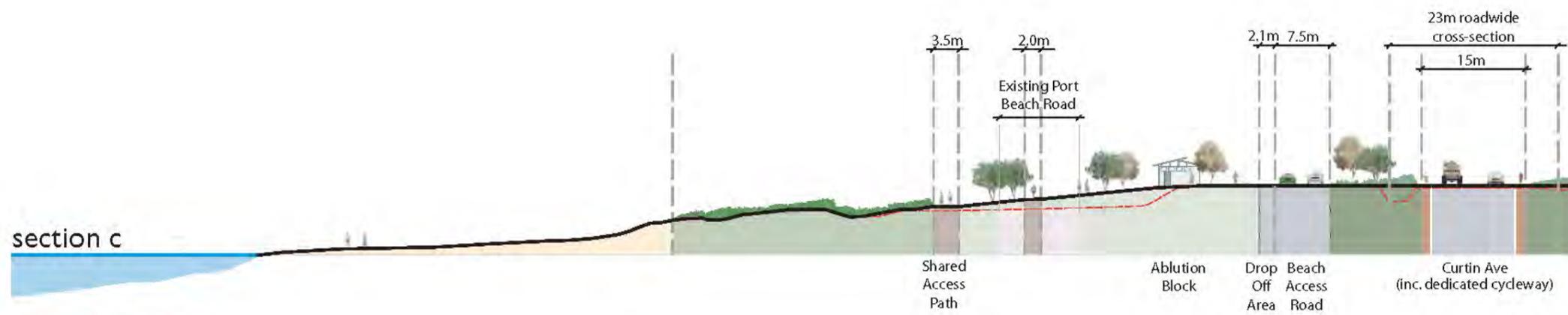
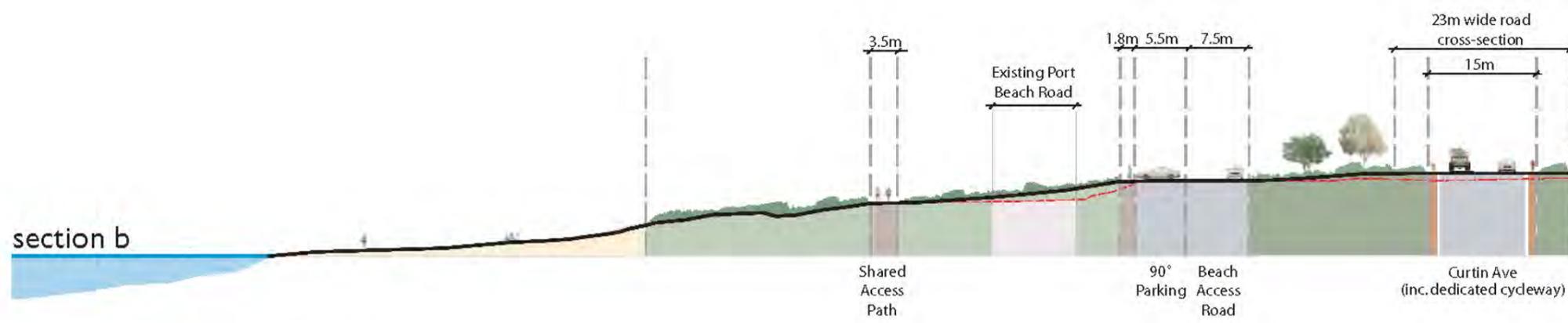
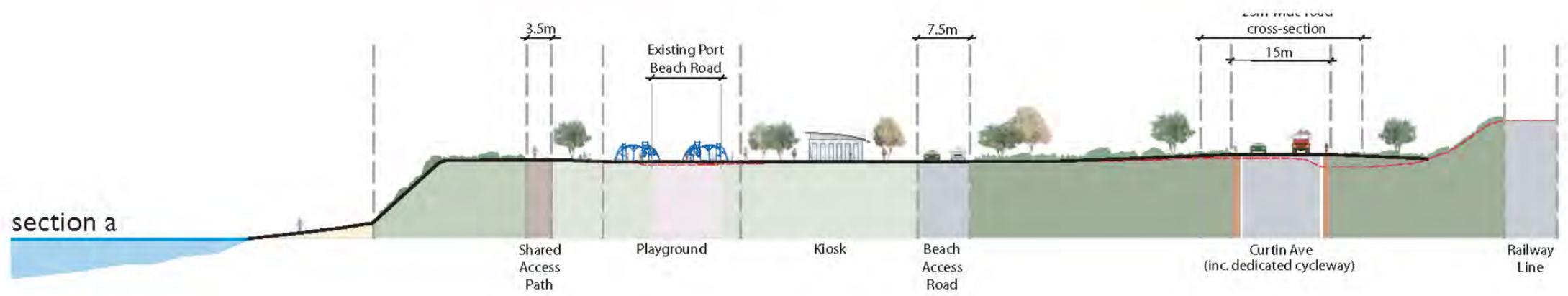
Note 1: Additional costs will be incurred through staging the works.

Note 2: Construction costs for Curtin Avenue subject to detailed design and planning, geotechnical investigations and approvals.

Probable Costs - Preliminary Costing

Table 1

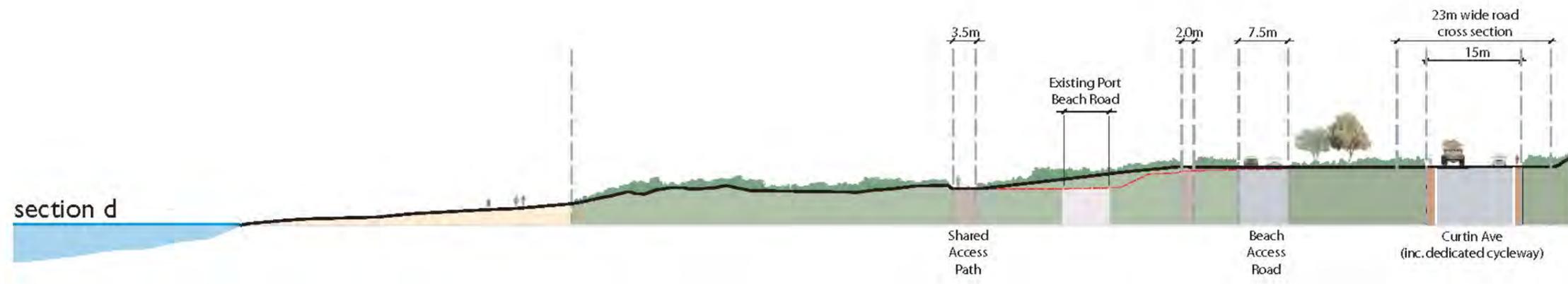




Landscape Sections - Sheet 1

Figure 2

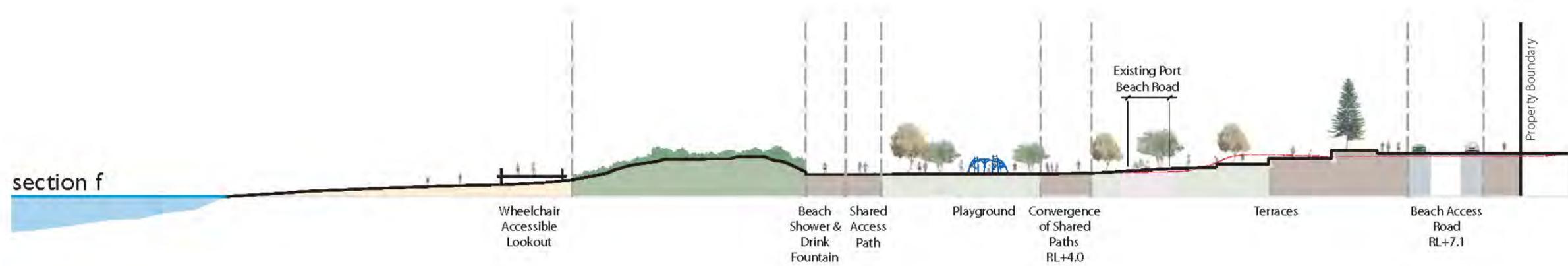
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Background

After extensive community consultation and the actions of the Leighton Action Coalition, the Government of Western Australia agreed to develop four hectares of the Leighton Marshalling Yards for housing and commercial uses and to set aside the remaining 13 hectares for a regional parks and recreation and public purposes (special purposes) reservation to become the Leighton Oceanside Parklands.

The Government prepared the Leighton Regional Planning Guidelines in December 2000 to provide planning objectives for the overall area. This includes coastal recreation, beach access and parking, regional transport and land use integration, heritage, landscape and visual amenity, environmental management and implementation and management.

The need to prepare a foreshore management and landscape masterplan for the remaining 13 hectares of public open space was identified as a recommendation of the guidelines.

The proposed Metropolitan Region Scheme Amendment 1074/33 has been advertised for public comment and outlines the actual area to be reserved for parks and recreation and public purposes - special uses (the Montessori School and the McCall Centre). It is currently in the process of being considered by the Minister for Planning and Infrastructure (Figure 4).

The Project Brief

In April 2005, Blackwell & Associates was commissioned by LandCorp on behalf of the Western Australian Planning Commission, as the lead design consultant to undertake the preparation of a draft landscape masterplan for the redevelopment of the Leighton Marshalling Yards.

The project brief was to develop a landscape masterplan for the Leighton Oceanside Parklands that addresses the rehabilitation and suitable landscape treatment of the site, the existing and future recreational needs of the regional community and the possible commercial and tourism opportunities.

The key project objectives, as outlined in the brief, are to:

- undertake a thorough site analysis;
- outline the project opportunities and constraints;
- prepare a draft landscape masterplan incorporating the appropriate level of public consultation;
- consider specific site clean-up and environmental management requirements;
- provide preliminary opinion of probable costs;

- consider the staged implementation of the masterplan;
- consider the existing Port Beach Road alignment and examine future vehicular access and car parking options;
- recommend the appropriate land vesting arrangements and park management structure; and
- ensure the park integrates with the adjacent proposed residential mixed use development area, existing residential areas and the other land uses and leaseholders within the project area.

The Project Area

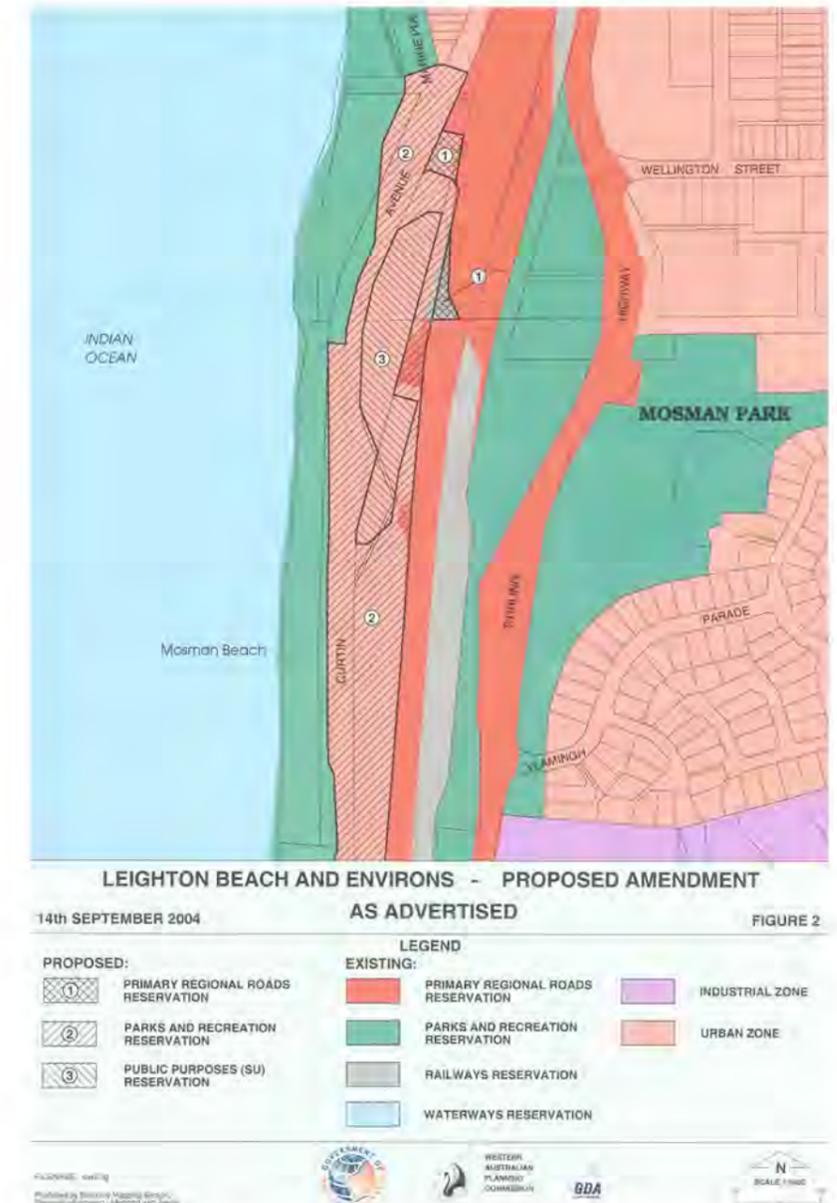
The project area is separated into primary and secondary study areas (Figure 5). The broad site extends from the Marine Parade and Curtin Avenue intersection in the north, to Tydemans Road in the south and is located within the municipalities of the City of Fremantle and the Towns of Cottesloe and Mosman Park. The primary area includes the balance of the marshalling yards (13 hectares) and an area around the Fremantle Surf Lifesaving Club. The secondary area (approximately 27 hectares) includes the foreshore reserve between the high water mark and the eastern boundary of the Port Beach Road reserve between Marine Parade in the north and Tydemans Road in the south.

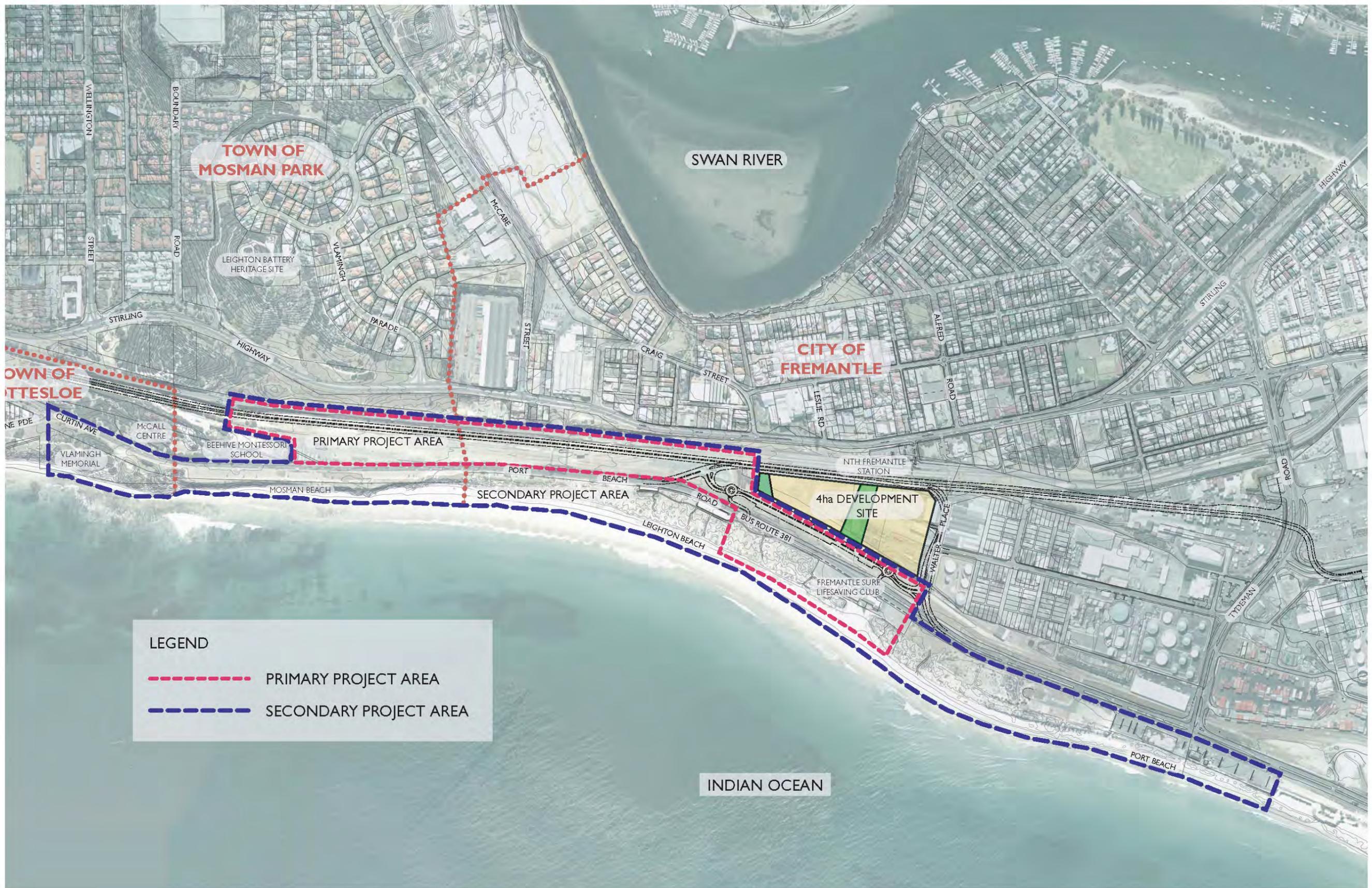
Project Management

The project has been managed by LandCorp on behalf of the Western Australian Planning Commission (WAPC). LandCorp appointed Clifton Coney Group to project manage the whole redevelopment of the Leighton residential and commercial site and the parklands area.

The design for a project of the size and complexity of the Leighton Oceanside Parklands requires an experienced project team. The team, headed by Blackwell & Associates, is made up of the following sub-consultants:

- Landscape Architects - Blackwell & Associates
- Surveyors - Whelans
- Planning Consultants - The Planning Group
- Traffic, Civil And Structural Engineers - Sinclair Knight Merz (SKM)
- Heritage Architects - Considine and Griffiths
- Irrigation Consultants - CADsult
- Aboriginal Heritage Consultants - Australian Interaction Consultants (AIC)
- Access Auditor - Brian J Kidd Pty Ltd Architect





Overall Project Area

Figure 5

The project has been overseen by a Steering Committee appointed by the Minister for Planning and Infrastructure that reported to the WAPC. A Community Stakeholder Reference Group (CSRG) provided more detailed community input through the public consultation process and reported to the Steering Committee.

Refer to Appendix I for members of the Steering Committee and the Community Stakeholder Reference Group.

Design Process

Basic Outline Of The Process

The design process for the development of the Leighton Oceanside Parklands landscape masterplan is outlined below:

- familiarisation and background research
- assessment of site conditions
- analysis of opportunities and constraints
- community consultation - public community forum
- participation in a comprehensive consultation program with the CSRG (three meetings)
- developing and testing a broad range of design solutions with the reference group
- fine tuning the draft landscape masterplan through further targeted consultation with key stakeholders
- presentation of the draft landscape masterplan report for endorsement by the Steering Committee
- presentation of the draft landscape masterplan report for WAPC and Minister for Planning and Infrastructure approval to release
- public advertising of the draft landscape masterplan for comment
- analysis of the feedback from the advertised draft landscape masterplan
- modification of the draft masterplan to address major issues raised through the advertised masterplan
- presentation of the modified landscape masterplan for endorsement by the Steering Committee
- presentation of the modified landscape masterplan report for WAPC and Minister for Planning and Infrastructure approval/ adoption

Consultation & Communication

Preliminary public input into the preparation of the draft landscape masterplan was an important component of the planning and design process. To facilitate the consultation and community input, Estill

and Associates were commissioned to undertake a community consultation program. The first stage in the consultation process was to hold a public forum, attended by approximately 120 people, to discuss planning and design issues and determine how the community was to provide further input into the design process. As a result, the Community Stakeholder Reference Group (CSRG), comprising some 20 members of the public, was formed to provide further stakeholder and community input into the formulation of the draft landscape masterplan (Appendix I).

Three community stakeholder reference group workshops were held to discuss in more detail the design opportunities, constraints and ideas for the parkland area and to provide input into the formulation of the draft landscape masterplan. The Leighton Oceanside Parklands Steering Committee members were also invited to attend each workshop.

In addition to the community consultation, several meetings with the three local governments (City of Fremantle, Town of Mosman Park and Town of Cottesloe) were held to keep them informed about the projects progress and design outcomes and to receive informal feedback from them.

Consultation with the local indigenous communities has begun. They have been issued with copies of the draft landscape masterplan and formal feedback will be received in due course.

The key design outcomes from the community consultation that have been incorporated into the landscape masterplan and the associated recommendations for its implementation, are as follows:

- construct the section of Curtin Avenue along the eastern boundary of the marshalling yards to connect between the proposed Marine Parade roundabout in the north, to Walter Place in the south, as soon as possible, separating the heavy regional traffic from the local and beach user traffic and allowing the full scope of the masterplan to be developed without incurring abortive works;
- realign and downgrade Port Beach Road to a low speed beach access road;
- improve pedestrian links to Stirling Highway, Vlamingh Parklands and the train stations (existing and proposed);
- improve car parking and vehicular access;
- improve pedestrian and cyclist access north to south through the site;
- integrate the parklands with the four-hectare development;
- manage beach access through well defined paths to minimise dune erosion;
- rehabilitate and revegetate the site using coastal species (with a preference for local species)



- minimise the use of turf to conserve water resources;
- focus recreational facilities and commercial activities to the northern and southern development nodes;
- direct immediately available funding towards developing the southern node; and
- develop a funding program to implement the draft landscape masterplan and ongoing its management.

A full report on the community stakeholder reference group proceedings has previously been issued and has been available on the WAPC website since the project was advertised.

Existing Conditions

The primary physical influence on the Leighton Oceanside Parklands site relates to its exposed coastal location (Figure 6).

Climate

The prevailing winds during the summer months are from the east and south-east in the mornings and from the south and south-west in the afternoon, ie the 'sea breeze'. These sea breezes often arrive before noon and significantly restrict the level of enjoyment of the beach.

In the winter months the prevailing winds are much stronger, being mostly associated with cold fronts and low-pressure systems. These are generally from the south-west and north-west. Major storms typically come from the north-west.

Not only do the exposed coastal conditions affect human behaviour through the desire to seek comfort and respite from the winds, but it also has a major impact on the types and species of plants that can survive in these conditions and the design of recreational facilities.

Increasing awareness about the potential health risk of sun exposure has contributed to the statistical evidence that the average beach user only spends 45 minutes on the beach.

Geology & Landform

The Leighton Oceanside Parklands site is part of the Quindalup dune system and is characterised by low windswept sand dunes underlain by a natural limestone foundation (ie Tamala limestone). The sands are typically devoid of any nutrients and are alkaline in their nature (ie high pH).

The current marshalling yards represent a significantly modified landscape. Extensive quarrying and levelling of the site has resulted

in a platform that is level with the adjoining Port Beach Road to the north and approximately 4.0 metres higher in the south. There is an extensive amount of ballast and hardstand existing throughout the marshalling yards most or all of which may require removal prior to the successful rehabilitation of the site. Historically there is known to be some soil contamination on the site. However, more recent experience on the four-hectare development site indicates that the extent of contamination, including asbestos and petro-chemical, is likely to be far more extensive than previously thought.

The northern end of the parklands site is marked by a limestone headland which offers greater protection from coastal processes than the low sand dunes to the south. During the winter months the sandy beach to the west of Vlamingh Memorial erodes, exposing the limestone shelf and the beach becomes impassable.

Coastal Processes

The State Planning Policy 2.6 State Coastal Planning Policy (SPP 2.6) provides guidelines to manage development on the coast. The policy provides a methodology to determine development set-backs to reduce the risk of erosion by coastal processes. It is primarily focused towards private residential development but should be considered when planning for any development in a coastal location. The policy considers three main factors when determining set-backs, distance for absorbing acute erosion (S1 extreme storm sequence) distance to allow for historic trend (S2 chronic erosion or accretion) and (S3 distance to allow for sea level change). The policy provides for set-backs to vary depending on the physical nature of the coast, such as sandy or rocky shorelines, and allows for exemptions from the policy for developments that are dependent on a foreshore location, such as surf lifesaving clubs. The development set-back for the Leighton foreshore area was determined as part of the preparation of the Leighton Regional Planning Guidelines. Where possible, all major infrastructure in the parklands is set back some 95 to 100 metres from the vegetation line. Recreational facilities are located within the set-back in accordance with the principles of SPP 2.6.

Whilst anecdotal evidence indicates that Leighton beach is accreting the northern section in particular is subject to quite marked seasonal changes.

Wind (as described above under "Climate") also plays an important role in coastal processes.



Vegetation

Prior to the extensive modification of the site, coastal heath would have been the dominant vegetation community. Now most of the 13Ha balance of the marshalling yards site is completely denuded of all vegetation.

Over the years community groups and the local councils have carried out revegetation works in the foredunes using local plant species suited to the dunal environment. Today, the condition of the vegetation within the coastal reserve varies considerably.

As a medium for growing plants, the local sands in the Leighton Oceanside Parklands area are fairly poor. This, in combination with the exposed climatic conditions, means that the species selected for use in the parklands will have to be coastally adapted species and suited to the alkaline sand types. There would be limited opportunities and/or requirements for the soils to be improved in certain areas using various additives to help broaden the species range. As a general rule, the severity of the coastal conditions reduces in proportion to the distance from the coast. Other modifying factors such as depressions in the landforms or the presence of substantial built forms or shelter from other vegetation also affect the viability of plants through the reduction in exposure to wind and salt spray that they provide.

Infrastructure

The Leighton Marshalling Yards site is currently bounded to the east by the Perth to Fremantle rail line and to the west by Curtin Avenue and Port Beach Road. Stirling Highway is located east of the railway. Both the rail line and Stirling Highway are elevated above the site at the northern end of the marshalling yards. The closest train station to the site is North Fremantle. Bus routes are available along Stirling Highway, Curtin Avenue and Port Beach Road. An existing footbridge connects North Fremantle to Leighton Beach. The Fremantle to Cottesloe Transport Plan prepared in 2001 by Transport WA, outlines several proposals that could affect the Leighton Oceanside Parklands. These include:

- extending Curtin Avenue alongside the railway;
- relocating North Fremantle Station towards Tydeman Road (former station site) or slightly south of the present location;
- reopening Leighton Station; and
- relocating Victoria Station to Wellington Street.

The Perth Bicycle Network Maps (DPI) show a proposed principal shared path (PSP) running down Curtin Avenue from the north of the site and then running parallel to and on the east side of the rail line throughout the balance of the length of the site. These maps also show an existing regional recreation path (RRP) that runs parallel to and on the west side of the old Port Beach Road alignment. This path is already inadequate (too narrow and poorly constructed/maintained) to cater for the broad range of users that it currently attracts.

Views & Vistas

As the landform rises to the north of the site the extent of views increase. The existing car park to the west of the Beehive Montessori School offers excellent views of the artificial surf break and Rottnest to the west, plus North Quay and Fremantle to the south.

West of the McCall Centre and south of the footbridge the views become more restricted due to the natural topography and low elevation of Port Beach Road and the pathway.

The elevation of the Perth to Fremantle train line provides rail passengers with extensive coastal views between the Beehive Montessori School and the North Fremantle Train Station.

Water Source & Supply For Irrigation

Demand

It is recognised that Perth's fresh water resources are limited and that it is critical to try to conserve this important resource as much as possible. At the same time it is necessary to recognise that lawn represents the best option currently available in terms of passive recreational surface treatments.

Based on the draft landscape masterplan's primary area plus the four-hectare site, ie a total of around 17Ha, CADsult determined that the landscape would require 58,000 cubic metres per annum to irrigate, once the plants are established. Volumes during establishment would be significantly higher. However, as the project is likely to be staged over quite a number of years, the establishment requirements would be staggered with a peak demand, ie greater than the above figure, only likely to occur during the final stage of development.

Nevertheless this volume of water represents a significant demand and problem with regard to sourcing (ruling out the use of potable mains water – which is unsustainable).



As a consequence the broad approach recommended to deal with this issue is as follows:

- Reduce the extent of irrigated turf to minimise water usage for irrigation purposes;
- Use only plant species (predominantly coastal native species) that do not require ongoing irrigation once established;
- Monitoring measures should be incorporated into the detailed design to avoid over-watering;
- A nutrient and irrigation management plan be prepared to achieve the most sustainable outcome;
- Explore alternative water supply options to avoid using potable water for irrigation purposes.

The first two of the above recommendations have already been incorporated into this current landscape masterplan and have already been partially implemented by way of the approved plans for the four-hectare development. The amount of turf grass has been reduced from 3.74Ha to 2.35Ha – a reduction of 37%.

Supply

Historically in Perth groundwater has been seen as the 'best' alternative to using potable mains water supply for landscape irrigation purposes.

At Leighton there are two alternative options with regard to sourcing groundwater:

- The superficial aquifer; and
- The confined Yaragadee aquifer.

Several groundwater investigations were undertaken as part of the draft landscape masterplan report. The irrigation sub-consultants, CADsult, undertook a review of the Colman Groundwater Report commissioned by ENV Australia in 2000.

At the time of preparing the draft landscape masterplan anecdotal advice from Ron Colman indicated that the best option would probably be to tap into the Yaragadee aquifer and that a reasonable case could be made to the Water & Rivers Commission in favour of this option which was likely to be received favourably. However, the extreme depth (nominally 500-1,000m) of the water and hence the high cost of this option warranted further exploration into the superficial aquifer as an alternative solution. Hence both of these options were explored.

Superficial Aquifer

The superficial aquifer was not an immediate first choice as a source - due to known problems with regard to the limited quantity and quality (high levels of salt intrusion) of the water in this aquifer particularly in the vicinity of the Mosman Peninsula.

Based on the draft landscape masterplan CADsult determined that a water supply would be required to provide a daily groundwater abstraction volume in a period of no more than 18 hours per day which would equate to 950L per hour per bore. Based on a water requirement equivalent to the replacement of 100 per cent of peak daily evaporation, the resultant irrigation area which can be accomplished from a single 'average' bore is in the order of 1600 sq m (0.16 ha). Therefore, from a bore field of 32 bores, the total effective irrigation area achievable is in the order of 5.12 ha. It was proposed in the draft masterplan that the total area of turf and planting that required irrigation in the parklands would not exceed five hectares.

Subsequent to undertaking these calculations the area of turf in the masterplan has been significantly reduced, which would have reduced the number of bores. However, more recent information has come to light through the development of the four-hectare site which indicates that there is a high probability of contamination, due to previous marshalling yard activities, in the superficial aquifer and as such this would be a very high risk option. The superficial aquifer is therefore not considered a viable solution.

Yaragadee Aquifer

At the time of preparing the draft masterplan the Yaragadee aquifer was seen as providing a more reliable long-term supply of water that would not risk salt intrusion and that could possibly also supply water to other surrounding open space areas, eg the Vlamingh Parklands. Advice at the time indicated that there could possibly be restrictions on access to the Yaragadee aquifer and it was recommended that a hydro-geological investigation be undertaken to further map the groundwater availability.

Subsequent to the preparation of the draft masterplan the Water Corporation has tightened up significantly on the issuing of any licenses for the confined Yaragadee aquifer and it is considered that, despite the benefits that the Leighton Oceanside Parklands will bring to the community that the likelihood of meeting their "Use Of Non-Drinking Water In Urban Developments" requirements, ie getting such a license is now very low.

Alternative Sources

As a consequence of the above LandCorp commissioned SKM to undertake a 'fatal flaw' analysis to address this problem titled "Irrigation Water Supply Balance and Quantative Assessment". This study, completed in June 2007, looked at the two above options as well as investigating the following alternative sources:

- Grey-water recycling;
- Rain-water runoff;
- Black-water (sewage) treatment (from the Matilda Bay Brewery);
- Reverse Osmosis Waste Stream (also from the Matilda Bay Brewery);
- Matilda Bay Brewery Wastewater.

The recommendations from the draft report indicated that the "three most effective ways of meeting the irrigation demand are:"

- Grey-water recycling from the four-hectare development (28,000 cubic metres);
- Reverse Osmosis Waste Stream from the Matilda Bay Brewery (40,000 cubic metres);
- Storm-water harvesting from the four-hectare development and Curtin Avenue and the new beach access road (18,000 cubic metres if no storage or up to 40,000 cubic metres if storage).

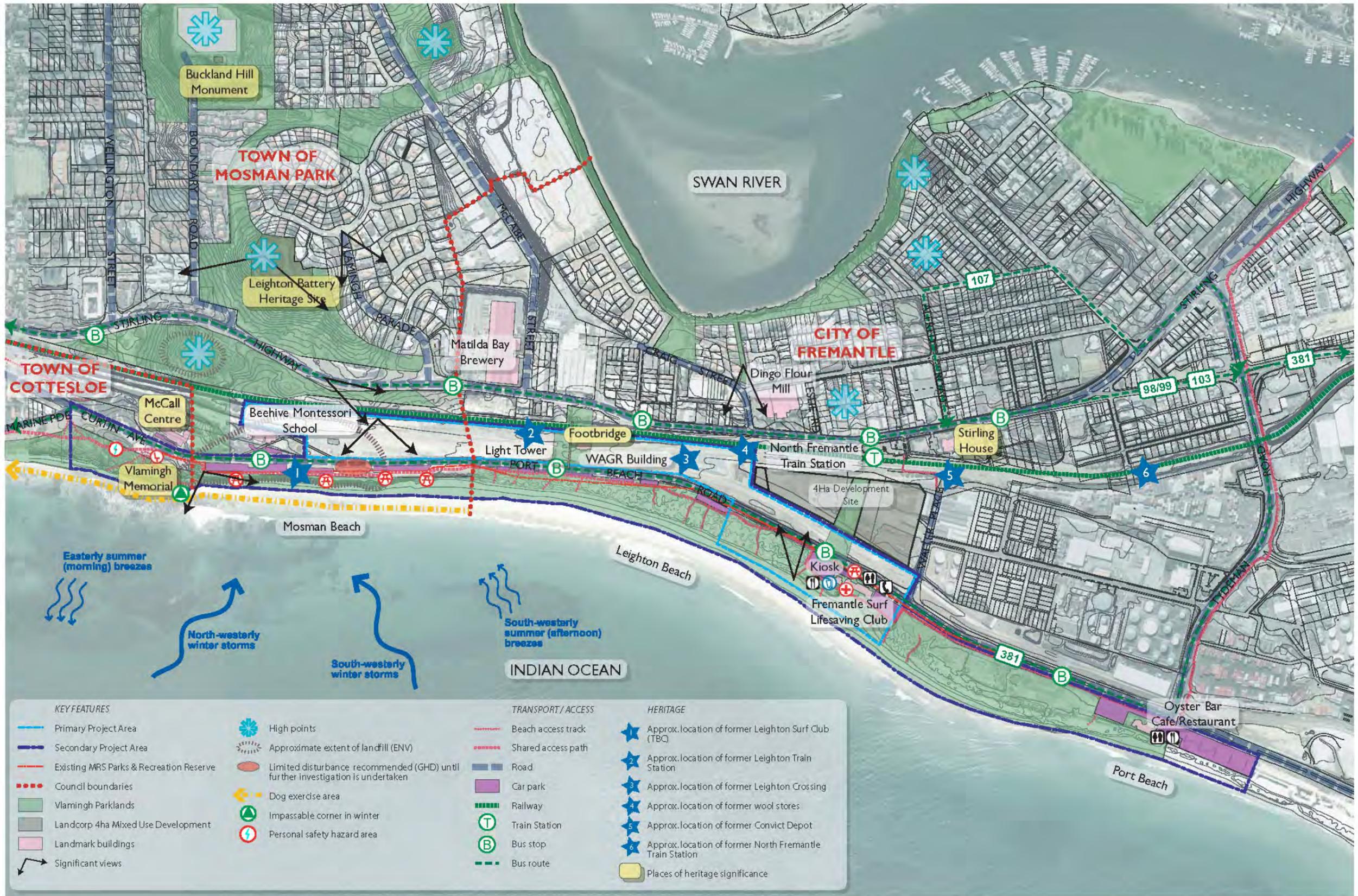
Unfortunately in the short time since the completion of the draft copy of this report it has been announced that the Matilda Bay Brewery will very likely be closing down in the near future.

Also, with regard to storm-water harvesting, whilst this is a good idea in principle it requires massive amounts of storage, ie it is considered to be impractical. Blackwell & Associates recently calculated that 600 litres of storage is required for every square metre of turf - just to provide for a six (6) week water supply.

As such at this point in time it would appear that the most effective way of meeting the irrigation demand will be to reduce the demand side as recommended above and to use:

- Grey-water recycling from the four-hectare development (28,000 cubic metres).

Note: it is considered that this is an achievable solution, however, it will require cooperation between the private and public sectors to achieve this outcome.



Site Analysis

Figure 6

Heritage

The Leighton Oceanside Parklands site has a rich history which has been well documented in the report *Leighton Marshalling Yards: Heritage Assessment and Advice*, prepared for the Ministry for Planning in September 2000 by heritage and conservation professionals.

The primary heritage themes and associated landmarks are:

- Aboriginal heritage - two aboriginal occupation sites listed under the Town of Cottesloe's Municipal Inventory;
- European exploration and settlement history - Vlamingh Memorial, former Convict Depot;
- Communications history - Cable Station (McCall Centre);
- Military history - former Leighton Battery (Buckland Hill);
- Industrial history - former and adjoining land uses, eg Dingo Flour Mill, Matilda Bay Brewery;
- Development and expansion of Perth along the rail corridor - former site of Leighton's Crossing, Leighton Station and North Fremantle Station; and
- Beach and surf culture - recreational use of the beach, establishment of the surf lifesaving clubs.

The Cable Station built around 1926 is registered by the Heritage Council of Western Australia and classified by the National Trust. Today, it is known as the McCall Centre and has been given a status order and interest as a reserve under management order with the Minister for Community Welfare as the primary interest holder.

The footbridge which connects North Fremantle to the beach was constructed in 1965. It is a Vierendeel truss bridge designed by engineer Donald Williams. While it is not currently registered with the Heritage Council it is regarded as having heritage significance as it is the only Vierendeel truss bridge in Western Australia.

Leighton Beach was named after John Leighton Sr. He and his family came to Western Australia in the 1800's, where he joined the police force. He was transferred to the North Fremantle Station, looking after the beach, station and farm areas.

Land Tenure

The Leighton Oceanside Parklands project area is made up of several land titles (*Figure 7*). The Marshalling Yards is under the jurisdiction of the Minister for Railways (Reserve No. 3730) while the land to the west of Port Beach Road/Curtin Avenue is under the jurisdiction of the City of Fremantle (Reserve No. 43311), Town of Mosman Park (Reserve No. 18016) and Town of Cottesloe (Reserve No. 30807).

Implications of Past Land Uses

Previous land uses have resulted in some site contamination. Between the years 1906 and 1936 an area to the north of the site was leased as a sanitary depot and as a result sanitary waste was deposited on site. For a number of years prior to 1986, construction and demolition wastes were dumped on a tip site near the Beehive Montessori School. Some of these materials remain visible along the Mosman Beach cliff face. During the 1960s wool sheds were demolished to accommodate the marshalling yards. During the life span of the yards various materials were stored on site including grain, oil, cars and chemicals.

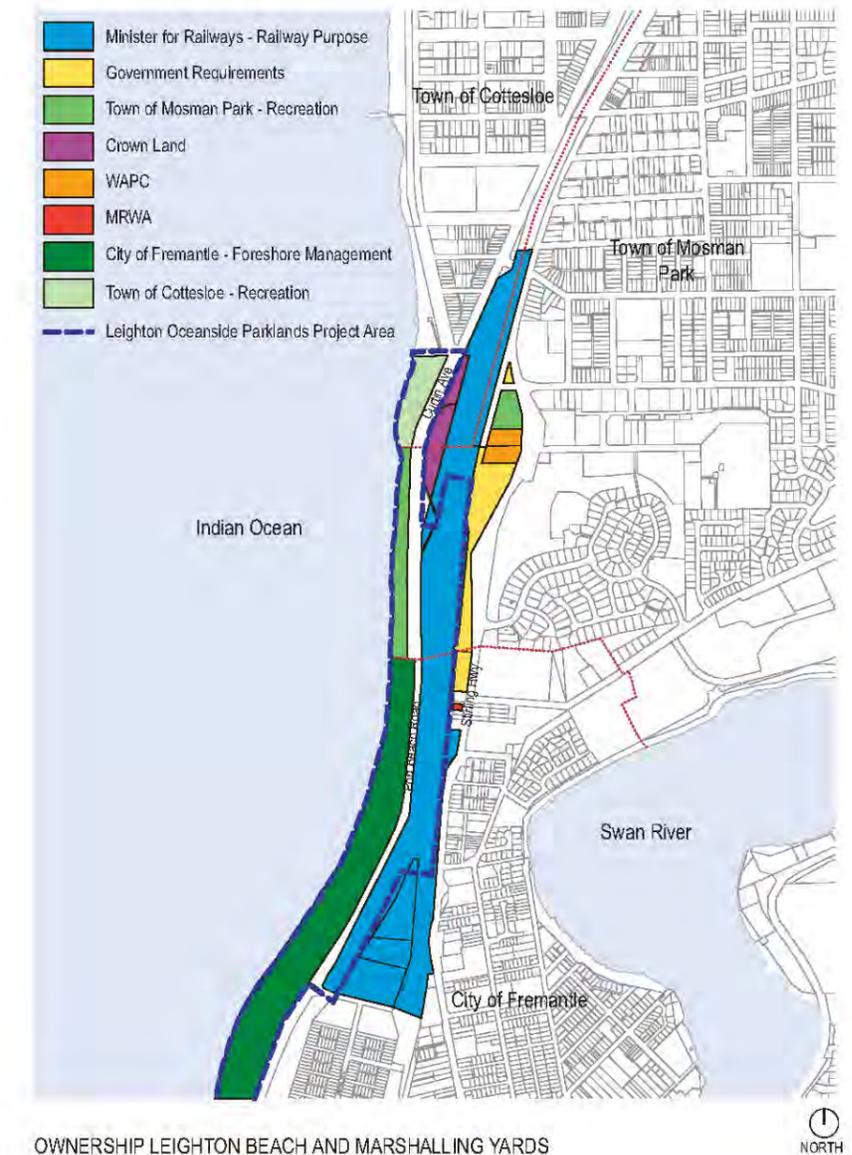
Four-Hectare Residential Development Site

LandCorp's overall vision for the four-hectare development site is to create a high quality, transit-oriented and mixed use urban village that incorporates contemporary design and high quality landscape, streets and parks. The design has been informed by the context of the beach, existing development in North Fremantle, the port and local industry.

The village will be mixed use - consisting predominantly of residential use, to accommodate at least 1,000 people with complementary retail, leisure and commercial uses. Building heights are limited to three and five storeys to preserve key westward vistas from North Fremantle.

The development area will include the following features:

- Construction of stage one of Curtin Avenue, on the eastern edge of the development adjacent to the Perth to Fremantle rail line, will remove regional through traffic from the beach access road.
- Construction of a new local access road, on the western edge of the development to replace the existing Port Beach Road, will facilitate access to the new recreation-oriented businesses that will be located within the development area and improve access to the beach.
- Two open space areas: the northernmost area will provide a passive recreational space and maintain the view corridor between North Fremantle and the beach; and the central open space area links the rail station and the beach and will be a landscaped plaza, activated by adjoining businesses, with seating, lighting, meeting spots and artwork.



OWNERSHIP LEIGHTON BEACH AND MARSHALLING YARDS

Land Tenure

Figure 7

Design Outcomes

Vehicular Circulation

The landscape masterplan (Figure 1) supports the construction of the Curtin Avenue extension on the east edge of the project area between Warton Street in the north and Walter Place in the south. This will provide a simple and direct route for regional traffic through the project area. It also enables a separate low speed beach access road to be aligned in such a way as to increase the park and recreational potential of the Leighton Marshalling Yards. Separating the heavy traffic from local traffic is seen as being crucial in order to create a road network that is more functional and safe for pedestrians, cyclists, beach users and motorists. Traffic noise and its effect on the proposed development nodes can also be managed more effectively and the existing traffic and parking issues associated with the Beehive Montessori School and beach access can be better addressed.

LandCorp has constructed a section of the realigned Curtin Avenue (due to open August 2007) along the eastern side of the four-hectare development. This section will return into Walter Place and then south onto the existing Port Beach Road alignment (until a final connection can be achieved in accordance with the Fremantle to Cottesloe Transport Plan).

The proposed realignment of the beach access road addresses the recommended coastal set-back and existing safety concerns associated with the pedestrian access to and from the footbridge. It allows park users to move from the proposed car parking areas and footbridge to the recreational nodes and beach without crossing the road.

A vegetated buffer of varying width is proposed between the beach access road and the future Curtin Avenue extension. The buffer will be required to some extent for storm water drainage basins and swales and may also be able to accommodate overflow car parking areas. It is proposed to incorporate some dunal forms and mounds to help establish an effective visual buffer between both travel routes.

Given the likely contamination issues on site it is proposed that all ground modelling should be achieved through fill only rather than by cut and fill as might otherwise be done.

A four-metre minimum width vehicular beach access route is proposed near the footbridge (ie Central Node) specifically to provide access for emergency and maintenance vehicles. It also provides a suitably wide beach access route for wind surfers.

The primary intent of the proposed beach access road and parking layout is to provide flexibility and convenience for everyday users while minimising any opportunities for anti-social behaviour. Some earth contouring will allow for the creation of a gently undulating scenic drive with westward views to the ocean.

Parking

The draft landscape masterplan provides a variety of parking options: 90 degree on-street parking, off-street parking and parallel drop-off parking at the windsurfing rigging area. For Crime Prevention Through Environmental Design (CPTED) reasons it is recommended that car parks remain closely aligned to the beach access road wherever possible. In terms of overall parking numbers the plan provides approximately 1,142 dedicated car parking bays, as opposed to the existing number of 838 (as calculated from aerial photography by Blackwell & Associates), which is an increase of 304 bays.

The proposal provides:

- a better aesthetic solution to the car parking issue;
- convenience for motorists;
- a safe beach access road / streetscape environment;
- management of anti-social behaviour; and
- minimal impact in terms of pavement devoted to dedicated car parking bays.

Pedestrian & Bicycle Circulation

A continuous 3.5 metre wide shared path is proposed running north to south through the project area connecting to the greater path network. At the development nodes, additional paths are provided to minimise potential conflict between cyclists and pedestrians. East to west pedestrian paths provide regular links between the car parks, shared path and beach. Recreational cyclists will be catered for in these new path arrangements.

Commuter cyclists travel at high speeds often in the vicinity of the 50 kilometre per hour speed limit. They require minimum obstructions and high quality pavement surfaces. A dedicated 1.5m wide cycle lane in each direction will be included on Curtin Avenue for commuting cyclists allowing the coastal pathway to support recreational cyclists and pedestrians.

A proposed pedestrian crossing at the Beehive School provides a safer route for parents and children accessing the school grounds from the car parking areas.



Recreational Facilities & Amenities

Southern Node

Due to its proximity to the four-hectare development site, the Fremantle Surf Lifesaving Club and the North Fremantle Train Station, the Southern Node will become a vibrant and popular beachside recreational area. It is regarded as the primary public recreational development node and will provide a connection from the beach through the central plaza of the four-hectare development to the North Fremantle Train Station. For this reason, a variety of passive and active recreational facilities are proposed to complement existing opportunities. A future upgrade to the surf lifesaving club could include its relocation and the addition of a café and restaurant to the northern end of the building allowing for shared facilities such as a kitchen and toilets. Discussions between the surf lifesaving club and Mirvac are currently underway further exploring such opportunities.

A number of options relating to the relocation of the surf lifesaving club were investigated during the preparation of the draft masterplan. However, as a result of discussions with the club at the time, and in the light of no specific funding having been put aside for this purpose, it was determined that in the immediate future a minor upgrade to the club in its current location would be the most achievable solution.

The draft landscape masterplan allows for some flexibility when it comes to the possible relocation of the club further down the track. An area immediately to the east is shown as providing a suitable alternative location. This is in keeping with the directions that the current discussions between the surf lifesaving club and Mirvac are currently taking. Some additional changes to car parking to the south may also be required to accommodate the final configuration of the surf lifesaving club.

In this context it was the intent of the Structure Plan that no new building development should restrict views through the central POS in the four-hectare development. Minor changes have been made to the location of the kiosk as shown on the draft masterplan to accommodate this intent. Any future redevelopment of the surf lifesaving club should also comply with this intent.

The Southern Node offers a considerable amount of wind protection but limited coastal views due primarily to the landform and associated levels. Views will be available from the paved and grassed terraces immediately west of the four-hectare site. These terraces have been configured so that each major step is 450 millimetres in height, which represents the optimum seating height. Steps and universally accessible ramps meeting AS1428 are

provided to connect the four-hectare development site to the southern node. These terraces have already been constructed as part of LandCorp's four-hectare development.

It is proposed that a grassed drainage swale be incorporated into the recreational area to the northern end of the node to accommodate the stormwater runoff from the adjoining road. It will be designed as a broad swale with the capacity to retain the stormwater run-off of a 1 in 100 year storm event with suitable gradients, such as 1:6, to allow for public use and access. The area will offer shelter from the prevailing winds and informal picnic and kick-about areas. As part of LandCorp's four-hectare development a 'temporary' stormwater sump was constructed immediately to the east of their site with walls on both the east and west sides of the sump. Once the above proposal is approved this will allow the demolition of the 'temporary' wall on the west side to allow the opening up of this area as per the landscape masterplan.

Central Node

The Central Node is located in the vicinity of the footbridge midway between the Northern and Southern Nodes. The footbridge provides a connection to the parklands and beach for Mosman Park and North Fremantle residents. The proposed function of the Central Node is primarily to provide a windsurfing rigging area (ie a grassed area), beach access for maintenance and emergency vehicles and a low-key public-use/picnic area with ablution facilities. In the longer term, additional recreation-related facilities and beach-related commercial facilities could be located in the area.

Northern Node

The Northern Node is proposed in the area to the south of the Beehive Montessori School. The area offers expansive ocean views due to its elevation, access to a sandy beach and protection from erosion due to the presence of limestone cliffs. Due to its proximity to a popular surfing area and distance from residential areas, it is proposed to locate a skate park within the northern area with associated facilities such as barbecue and picnic tables and shelters and a kiosk or café. The co-location of these facilities will assist with the provision of passive surveillance in the area. The skate facility should be located in reasonably close proximity to the final Port Beach Road alignment to further enhance security.

The area around the Vlamingh Memorial offers a unique coastal environment and is the area referred to as requiring further involvement of the public in the design development process. The existing landform provides areas with a considerable amount of



Artist's Impression: Four Hectare Site and Stage 1 Interface



Artist's Impression: Southern Node - Stage 1

protection from prevailing winds as well as areas that offer expansive ocean views. Due to existing safety concerns, it is proposed to improve opportunities for passive surveillance from the road by removing some of the existing vegetation understorey. In addition, the draft landscape masterplan proposes seating, boardwalks and improved pathway systems.

Other Issues

Site Remediation & Rehabilitation

Existing investigations to determine soil and groundwater quality in the project area have, to date, been limited. GHD prepared the "Leighton Marshalling Yards Project: Soil and Groundwater Investigation" report in 2002 and concluded that both the groundwater and soil quality was suitable for parks and recreational purposes. ENV prepared the "Leighton Marshalling Yards: Environmental Site Assessment" report in 2000 and concluded that soil contamination was of a limited extent and the extent of remediation was dependent on the future land use. Both reports recommend that further investigative work be undertaken of the marshalling yards site.

More recent experience on the four-hectare development site indicates that the extent of contamination, including asbestos and petro-chemical contamination, is likely to be far more extensive than previously thought. The costs of site remediation on the four-hectare site have been well over \$2M.

The draft landscape masterplan proposed to retain the old landfill to the west and south-west of the Beehive Montessori School. The existing paved car parks within the Town of Mosman Park have shown no signs of subsidence since their installation approximately twenty years ago.

Given the likely contamination issues on site it is proposed that all ground modelling should be achieved through fill only rather than by cut and fill as might otherwise be done. Further work is required to ensure compliance with the recently legislated Contaminated Sites Act 2003 (effective as of 1 December 2006).

Environmental Sustainability

To promote the environmental sustainability of the park, all plants are to be carefully selected for their suitability to the exposed coastal conditions and their low water requirement, with a preference for indigenous species. The provision of grassed areas in the development nodes is supported by the Community Stakeholder Reference Group. However, the total area of irrigated grass has been reduced since the draft landscape masterplan in recognition

of the difficulties in sourcing suitable water for irrigation purposes. As a consequence the amount of turf grass has been reduced from 3.74Ha to 2.35Ha – a reduction of 37%.

The proposal to use recycled grey-water from the four-hectare LandCorp development is strongly encouraged.

Innovative materials such as recycled plastic compounds should be considered as an alternative to wood or extruded metal for use in furniture and as a timber decking replacement.

The use of more energy efficient lighting in the landscape should be investigated.

Underlying all built form design is the aspiration to achieve the highest possible standards of energy efficiency and environmental sustainability. All buildings should aim to maximise passive solar heating, cooling and natural ventilation, and reduce energy consumption wherever possible. Means of achieving this include: orientation; access to sunlight; and the thermal performance of buildings and their construction materials.

Staging Of Works

Implementation of the landscape masterplan is proposed to be undertaken as a staged process (Figure 8). The availability of funds and the budgeting process will, by necessity, mean that construction is likely to occur over a period of years. Currently there is about \$4.0 million of funding available and it is proposed to use this funding for the development of Stage One, based around the Southern Node.

The rate of development of the subsequent stages will depend, to a large extent, on the timeframe for the construction of Curtin Avenue, the ability to gain funding, community priorities, local government support and the attraction of private funding for respective commercial activities in selected locations.

LandCorp has now nearly completed the construction of the civil and landscape works associated with the four-hectare site. A fundamental aspect of the design of the four-hectare site has been to create a strong pedestrian connection and link from the North Fremantle Train Station through a central plaza into the foreshore area and to the beach. It is important for the Stage One works (Figure 9) to be undertaken as soon as possible to complement the development of this site and to provide the pedestrian connection from the station to the beach and the recreational facilities in the foreshore area. The construction of Curtin Avenue north of the four-hectare site is not necessary to achieve the implementation of Stages One or Two.







Maintenance & Management

Maintenance

The landscape masterplan has been developed in consultation with the City of Fremantle, Town of Cottesloe and Town of Mosman Park. Specific concerns have been raised by each of these Councils as to who is going to pay for the ongoing maintenance with each of them stating that they are not prepared to cover any additional costs as a result of the development of the parklands.

Specific maintenance issues raised in relation to the landscape masterplan proposals included, but are not limited to, durability, vandal resistance, weather resistance, robustness, repairs and preventative upkeep, irrigation water supply, landscape and irrigation maintenance.

All materials, planting, facilities, street furniture, lighting, and infrastructure chosen for the Leighton Oceanside Parklands are to be selected with longevity in mind. By choosing elements with a long life expectancy, maintenance and replacement costs will be minimised.

Appropriate maintenance regimes will be required to be established in order to keep the asset base in a high quality condition. These should cover all aspects of the hard and soft landscape elements and will range from daily schedules, such as litter collection, to monthly maintenance on items such as street furniture or tree pruning and ultimately to long-term issues such as the replacement of broken and worn down items.

There are a number of maintenance tasks that the local governments already undertake including the sweeping and clearing of sand from pedestrian routes, particularly around beach access points; the clearing of litter and emptying of bins within the foreshore area and on the beach itself and ensuring that public toilets and change rooms remain clean.

Each local government has existing budgets for the maintenance of their respective foreshore areas. However, these costs will not cover the cost of maintaining the new facilities and additional funding and resources will be required.

Management

It is recommended that a management plan be developed to ensure that no areas of the Leighton Oceanside Parklands become degraded through over-use or poor maintenance. From the City of Fremantle, Town of Mosman Park and Town of Cottesloe's perspective, the more income-generating facilities provided, the more acceptable the landscape masterplan and associated management becomes. In other words, such income would offset maintenance costs, ideally

to allow the project (management) to be cost neutral. As such, the opportunities for incorporating income-producing operations such as leasehold developments, requires further exploration.

The long-term management of the parklands is an ongoing issue that is yet to be resolved.

Probable Costs

Preliminary Costing

The estimated total probable cost of the construction of the draft landscape masterplan is approximately \$30 million excluding GST (Table 2).

It is important to note that there are a number of items that have been excluded from the probable costs as they either involve further investigation or are considered outside the scope of the Leighton Oceanside Parklands project. These are:

- Construction costs for the Curtin Avenue extension;
- Demolition of the old rail control building, lighting tower and removal of other railway infrastructure;
- Import of clean fill;
- Site remediation (investigation and remediation if required);
- Bore installation;
- Upgrading and modifications to the footbridge;
- Upgrading of the Fremantle surf lifesaving club;
- Costs associated with the maintenance of the dunes and beach;
- Aboriginal monitoring; and
- Eradication of rabbits.

Curtin Avenue

Construction costs for the Curtin Avenue extension have been estimated at \$7.86 million for a two-lane road between the proposed Marine Parade roundabout and the four-hectare development site. The cost is subject to detailed design and planning, geotechnical investigation and approvals. A timeframe is yet to be determined.

Ongoing Maintenance

The schedule below outlines the estimated ongoing maintenance costs for each stage of the development of the draft landscape masterplan over a period of four years after the completion of a 52-week defect period.



Description	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Total
Preliminaries, Demolition & Earthworks						
Sub-Total	\$ 576,918	\$ 324,711	\$836,273	\$771,720	\$475,740	\$2,985,361
Furniture						
Sub-Total	\$ 318,180	\$ 40,283	\$ -	\$234,163	\$54,693	\$647,318
Structures						
Sub-Total	\$ 1,479,136	\$ -	\$ -	\$ 2,200,800	\$ -	\$3,679,936
Roadworks & Car Park (exc. Curtin Ave)						
Sub-Total	\$ 484,049	\$ 365,508	\$ -	\$ 1,663,156	\$ 216,621	\$2,729,335
Roadworks associated with Curtin Ave (2 lanes)						
Sub-Total	\$ -	\$ -	\$ 7,860,000	\$ -	\$ -	\$7,860,000
Paving & Edges						
Sub-Total	\$ 423,725	\$ 82,530	\$ -	\$ 248,481	\$ 324,618	\$1,079,354
Lighting						
Sub-Total	\$ 140,000	\$ 165,060	\$ -	\$ 91,700	\$ 91,700	\$488,460
Soil Preparation						
Sub-Total	\$ 17,200	\$ 6,196	\$ -	\$ 24,890	\$ 31,627	\$79,913
Planting & Turf						
Sub-Total	\$ 901,892	\$ 312,388	\$ 917,000	\$ 738,840	\$ 472,098	\$3,342,218
Irrigation						
Sub-Total	\$ 186,250	\$ 42,182	\$ -	\$ 336,670	\$ 235,014	\$800,116
Additional Items (provisional sums associated with civil works)						
Sub-Total	\$ 114,121	\$ 103,777	\$ 123,427	\$ 143,077	\$ 179,102	\$663,504
Headworks & Fees						
Sub-Total	\$ 413,774	\$ 174,225	\$ 200,290	\$ 823,558	\$ 418,039	\$2,029,886
Allowance for Abortive Work						
Sub-Total	\$ -	\$ -	\$ 39,300	\$ 139,515	\$ 286,235	\$465,050
Contingency						
Sub-Total	\$ 727,091	\$ 163,910	\$ 1,005,653	\$ 792,812	\$ 288,865	\$2,978,330
TOTAL (Excluding GST)	\$ 5,782,336	\$ 1,780,769	\$ 10,981,942	\$ 8,209,381	\$ 3,074,351	\$30,068,779
GST (10%)	\$578,234	\$178,077	\$1,098,194	\$820,938	\$307,435	\$3,006,878
TOTAL (Including GST)	\$6,360,569	\$1,958,846	\$12,080,136	\$9,030,319	\$3,381,786	\$33,075,657

This OPC does not include for any eradication of rabbits, services, artwork, buildings, aboriginal monitoring, footbridge modifications/upgrade, water source / supply / headworks costs or any site remediation. All figures are excluding GST.

Note 1: Additional costs will be incurred through any further staging of the works.

Note 2: Roadworks cost associated with Curtin Ave excludes drainage, fencing, retaining structures, plus the Wellington and Victoria St intersections. Construction costs for Curtin Ave subject to detailed design & planning, geotechnical investigations and approvals. Time frame yet to be determined. Engineering works allowed for as a separate contract.

Note 3: This OPC does not include the proposed upgrade to the Fremantle SLSC including a cafe/restaurant extension or upgrade to Vlamingh Memorial.

Note 4: This OPC does not allow for maintenance.

Probable Costs - Preliminary Costing Breakdown

Table 2

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Mapping supplied by Blackwell & Associates.

Appendix I

Committee Membership Details

Steering Committee

Members of the Steering Committee are:

- Dr Mike Mouritz - DPI (Chair)
- Warren Giddens - LandCorp
- Ian Robson - Public Transport Authority
- Cr Doug Thompson - City of Fremantle
- John Humphreys - Town of Mosman Park
- Sue Harrington - Community Representative
- Bruce Moriarty - Community Representative
- Robert Rowell - Community Representative
- Peter Deague - Community Representative
- Gregory Clements - Community Representative
- Andrew Moore - DPI (technical advice & support)
- Jill Gaynor - Landcorp (technical advice & support)

Community Stakeholder Reference Group (CSRG)

Members of the CSRG are:

- John Summers - Fremantle SLSC
- Mike Ewing - Cottesloe Coastcare
- John McAulay - Business
- Jill Dare - Beehive Montessori School
- Dianne Davidson - Buckland Hill Ratepayer's Assoc.
- Andrew Sullivan - Leighton Action Coalition
- Gerard MacGill - Nth Fremantle Community Assoc.
- Trish Bevan - Northbank Residents Association
- Cathy Hall - Fremantle Society
- Paul Wilkes - Cottesloe Resident
- Anne-Marie Darcy - Cottesloe Resident
- Colin Duffield - Resident
- Susan Robertson - Resident
- Sandi Nielson - Mosman Park Resident
- Judith Browning - Mosman Park Resident
- Max Hewitt - North Fremantle Resident
- David Kaesehagen - North Fremantle Resident
- Brad Pettit - Resident
- Daniel Engdahl - Windsurfing WA
- Craig Bibra - Recfishwest
- Alex Bell - WA Kite Surfing Association
- Dale Stanton - WA Kite Surfing Association

