Port Hedland Consolidated Foreshore Redevelopment Master Plan

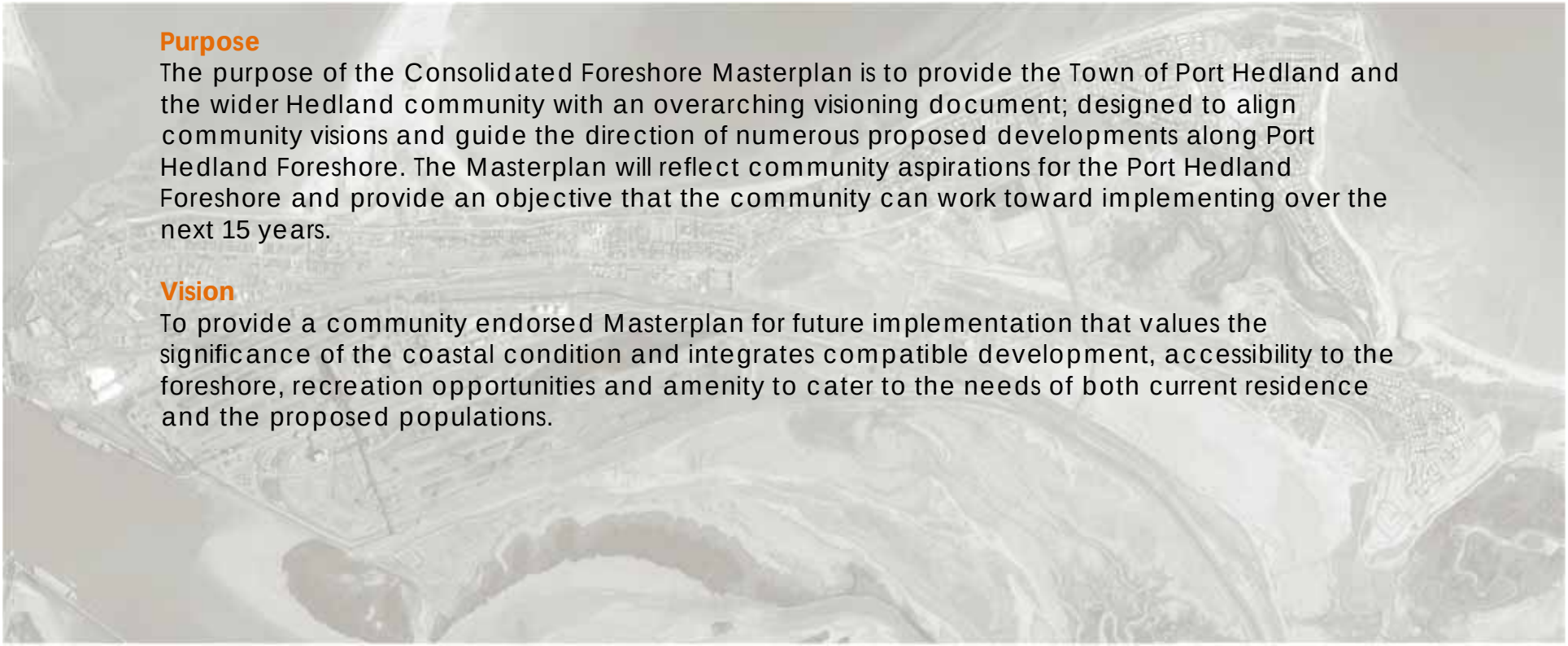
VISION DOCUMENT

ucla

Town of Port Hedland

CONTENTS

INTRODUCTION



Purpose

The purpose of the Consolidated Foreshore Masterplan is to provide the Town of Port Hedland and the wider Hedland community with an overarching visioning document; designed to align community visions and guide the direction of numerous proposed developments along Port Hedland Foreshore. The Masterplan will reflect community aspirations for the Port Hedland Foreshore and provide an objective that the community can work toward implementing over the next 15 years.

Vision

To provide a community endorsed Masterplan for future implementation that values the significance of the coastal condition and integrates compatible development, accessibility to the foreshore, recreation opportunities and amenity to cater to the needs of both current residence and the proposed populations.

WORKSHOP OVERVIEW

During the development of the master plan, a number of workshops were undertaken to gain design input and directions from stakeholders within the Port Hedland community.
The workshops included:

Workshop 1 – Opportunities and Directions (Working Group)
Workshop 2 - Sketch Options (Working Group)
Workshop 3 – Sketch Options (Aboriginal Group)
Workshop 4 - Draft Foreshore Masterplan (Development Assessment Group)
Workshop 5 - Draft Foreshore Masterplan (Working Group)

Information and opinion gained though the workshop process has informed all aspects of this report and master plan.

OPPORTUNITIES AND DIRECTIONS

Review of Precedent Projects

Darwin Waterfront , Darwin, NT

Riverside Park, Brisbane, QLD

Geelong Waterfront, VIC

Pirama Park, Sydney, NSW

The Edge Park, New York, USA

Eerie Street Plaza, Milwaukee, USA

OPPORTUNITIES AND DIRECTIONS

Environmental Considerations

Coastal hazard risk management and adaption planning

The Consolidated Foreshore Masterplan is expected to be developed over the next 15 to 20 years. The nature of the timeframe means that the majority of development associated with the Masterplan is likely to be affected by short, medium and/or long term coastal change. Due to this fact, the Masterplan considers and responds to the Cardno 2011 Port Hedland Coastal Vulnerability Study and the Draft State Planning Policy 2.6 State Coastal Planning (SPP) and the accompanying Policy Schedule One.

An investigation into the requirements of SPP 2.6 Schedule One is reflected in the Cardno 2011 Port Hedland Coastal Vulnerability Study that identifies a Coastal Processes Setback (CPS) for Port Hedland. The intention of the CPS is to provide a buffer between the shoreline and development in which coastal changes in the short, medium and long term can occur. The CPS distance is based on the combined results of Acute Erosion (Extreme Storm Sequence), Historic Trends (Chronic Erosion or Accretion) and Sea Level change. UDLA's Masterplan considers the long term 100 year CPS, as modelled by Cardno.

In accordance with the SPP 2.6, UDLA have undertaken a brief Coastal Hazard Risk Management and Adaption plan to ensure the Consolidated Foreshore Masterplan responds to the Policy requirements and the CPS. The management adaption methods employed are noted in tables following the design proposal for each study area and propose the following four measures:

1) **Avoid** the presence of new development within an area identified to be affected by coastal hazards.

2) Plan a managed **retreat**: relocate or remove assets within an area identified at risk.

3) If sufficient justification can be provided for not avoiding development of land that is at risk from coastal hazards then accommodate **adaptation** measures should be put in place.

4) **Protection** works may be proposed for areas where there is a need to preserve the foreshore reserve, public access and infrastructure that is not expendable.

OPPORTUNITIES AND DIRECTIONS

Environmental Considerations

Cardno coastal vulnerability study findings

The Coastal Processes Setback (CPS) provides a buffer zone between the shoreline and development in which coastline changes in the short can occur.

The calculation of the CPS distance is the combined result of the following factors :-

(S1) Distance For Absorbing Acute Erosion (Extreme Storm Sequence)
(S2) Distance to Allow for Historic Trend (Chronic Erosion or Accretion)
(S3) Distance to Allow for Sea Level Change

OPPORTUNITIES AND DIRECTIONS

Environmental Considerations

Cardno coastal vulnerability study findings

The overarching findings for the Port Hedland foreshore are:

1) With the present landform levels, the West End business area of Port Hedland and surrounding streets are completely inundated in the 100yr CPS.

2) The Spoil Bank is inundated in both the 100 year and 500 year ARI event, with only a small portion left unaffected.

3) A low lying section of shoreline at Cemetery Beach (approximately 6m AHD) serves as an opening to high tide storm surge that can enter the lower lying area in East Port Hedland as well as the main business area.

4) East Port Hedland is at risk of inundation in the short term as flows from Pretty Pool estuary and the Four Mile creek Estuary flow into this low lying area, and the breakout point east of the spoil bank.

5) The Pretty Pool development remains above the 500 year inundation level in the immediate term as well as the 50 year and 100 year planning periods.

OPPORTUNITIES AND DIRECTIONS

Environmental Considerations

Master plan and SPP 2.6 policy objectives alignment

The four objectives are SPP 2.6 are:

1) Ensure that the location of coastal facilities and development takes into account coastal processes, landform stability, coastal hazards, climate change and biophysical criteria;

2) Identify appropriate areas for the sustainable use of the coast for housing, tourism, recreation, ocean access, maritime industry, commercial and other activities;

3) Provide for public coastal foreshore reserves on the coast; and,

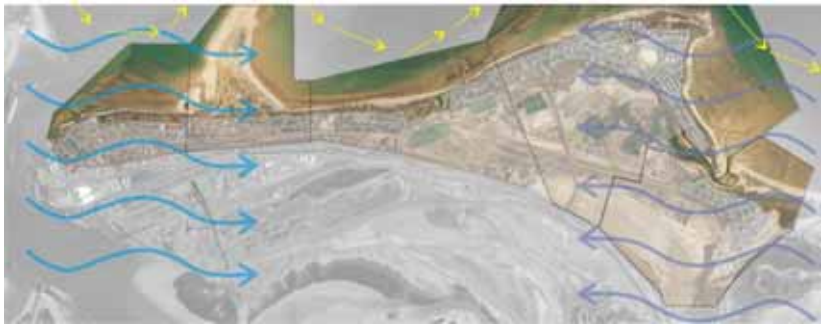
4) Protect, conserve and enhance coastal values, particularly in areas of landscape, nature conservation and habitat, indigenous and cultural significance.

Detail of the master plan's response to SPP2.6 and the findings of Cardno's Port Hedland Coastal Vulnerability Study are outlined for each study area.

OPPORTUNITIES AND DIRECTIONS

Environmental Considerations

Other environmental factors considered relevant to Port Hedland include:



Wind

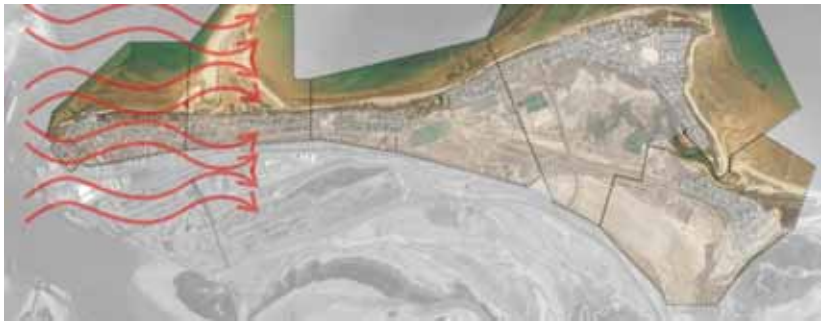
The wind direction changes from wet to dry season.

Wet Season: - prevailing westerly winds
- hot, and induce annual rainfall

Dry Season: - prevailing easterly winds
- generally dry

Sediment Movement

Near shore mobile sediment moves in a net eastwards direction



Dust

Dust transportation occurs from West to East of Port Hedland.

Dust taskforce findings recommend limiting residential development to the West End with new residential development focussed east towards Cooke Point and Pretty Pool.

OPPORTUNITIES AND DIRECTIONS

Environmental Considerations

Vegetation and access

Sensitive coastal ecosystems exist in and around Port Hedland. To provide the opportunity to experience these natural assets whilst accommodating their preservation is a challenge for the town.

Off-road vehicles have caused significant impact upon local ecosystems however are considered part of "*living the Pilbara dream*", a balance is therefore required to allow this popular activity whilst limiting its environmental damage.

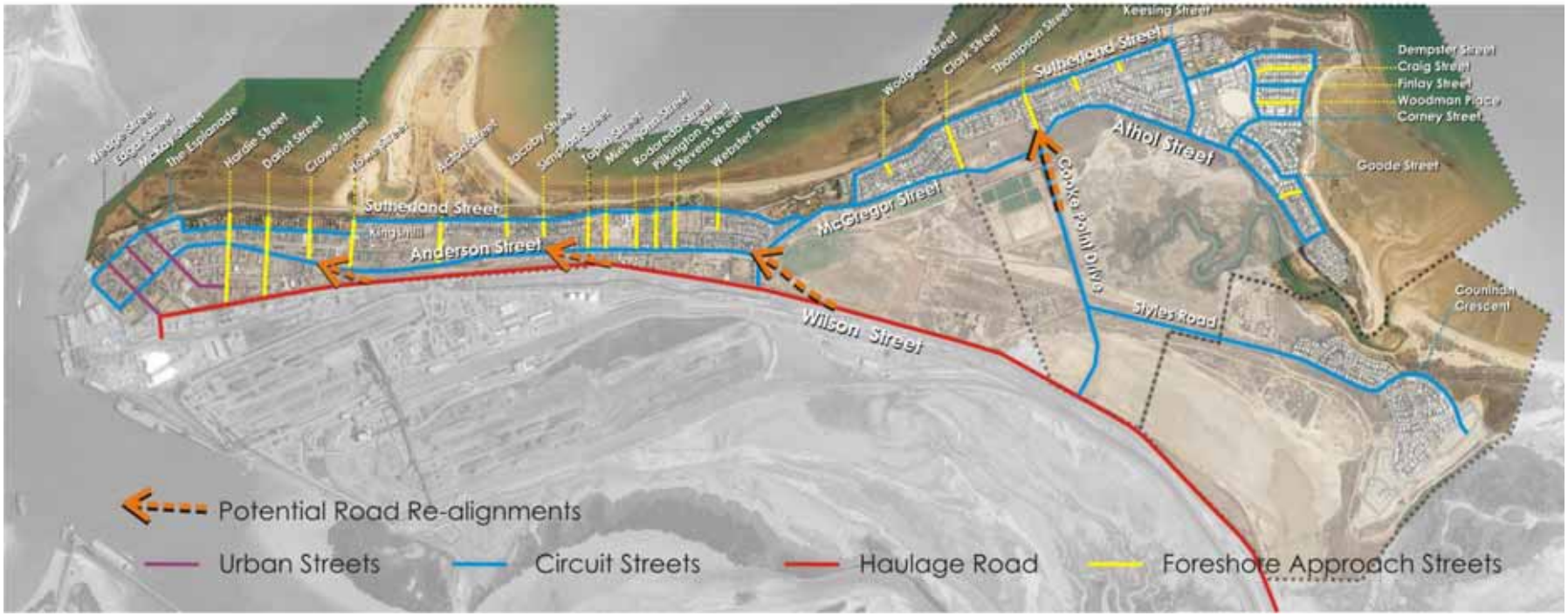
Land Use

Land use zoning in Port Hedland creates general activity nodes (community and commercial clusters) which can be used to define master plan study areas or concept nodes.

Influenced by dust migration there is an overall trend towards commercial, urban and short term residential dwellings in the western side of town and a more suburban, long term residential in the east.

OPPORTUNITIES AND DIRECTIONS

Connections - Street Legibility



The Foreshore is difficult to define due to network of streets that are hard to navigate.
There are opportunities for improvement in road alignments to improve navigation to the foreshore including:

- Define coastal access by realigning Cooke Point Drive into Thompson Street.
- Separation of light and heavy vehicles along Wilson and Anderson Street.
- Increased legibility of streets leading to the coast with street tree avenues.

OPPORTUNITIES AND DIRECTIONS

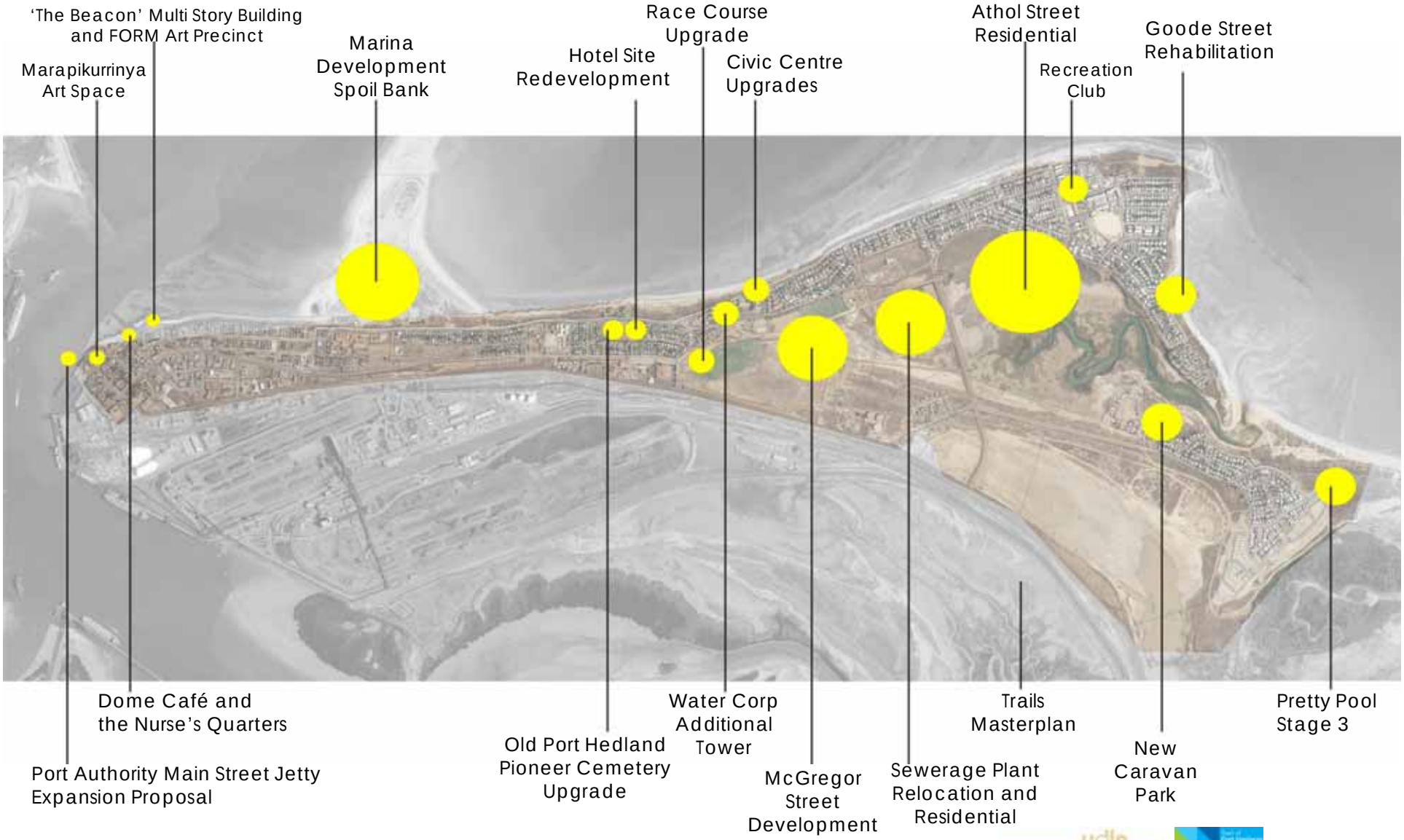
Connections - Pedestrian and Cycle Paths

Existing paths near the foreshore are very popular, however these paths depart from the foreshore in several locations and are disconnected in certain areas. An opportunity exists to develop the existing paths into a continuous, dual use route along the extent of Port Hedland's foreshore.

Areas of Port Hedland's coast are difficult to access or are accessed through informal tracks. An opportunity exists to define and improve coastal access to encourage interaction with the coastal environment whilst limiting associated ecological degradation.

OPPORTUNITIES AND DIRECTIONS

Proposed Developments



OPPORTUNITIES AND DIRECTIONS

Key Issues

Following a desktop review and feedback from engagement with the community, the following key issues were identified:

1) **Inundation during storm surge** presents a risk to the town. It is therefore necessary to ensure all infrastructure at risk of inundation is built to withstand temporary flooding.

2) **Shade** is important in creating amenity and comfort for the pedestrians in the town. Tree planting can assist in increasing the public's use of open spaces. Trees also add to the visual appeal and help define the foreshore areas and should be added where possible.

3) **Storm water management** is required and runoff from hard surfaces should be retained on site to reduce adverse impacts to coastal ecosystems. Run-off from all impervious areas (i.e. Roads, paving and roofs of buildings) should be directed to retention basins.

4) **Amenity and litter management** is important and there is a need to ensure that the quality and amenity of existing urban areas and local environmental attractions are maintained.

5) **Re-vegetation** is required in some areas as significant wind and water erosion can occur from denuded areas, all existing foreshore access tracks that are not required should be closed and remediated and revegetated with suitable endemic species.

6) **Pedestrian and cycle networks** are popular and the Trails Master Plan prepared by GHD identified some notable gaps in the existing network and there is an opportunity to provide continuity along the length of the foreshore.

7) **Weed control** should be considered in all proposals during construction and establishment.

OPPORTUNITIES AND DIRECTIONS

Key Issues

8) **Migratory shorebirds** use the area of Pretty Pool Beach and samphire habitat for foraging and roosting. Human activities can have an adverse impact on birds foraging and roosting. Measures should be taken to reduce access in sensitive areas.

9) **Mosquito borne diseases** have been found in the Pilbara region; tidal inundation and the ponding of water pose the greatest challenge to mosquito and midge management. New proposals should consider measures that minimize the possibility of water ponding, stagnation, and a careful selection of lighting.

10) **Mangrove communities** provide and play an important role in stabilising the intertidal areas. Changes in hydrology and increasing nutrient inputs from storm water causes adverse impacts on mangroves. Appropriate measures should be implemented to prevent impacts to these areas.

11) **Turtle hatchlings** have been recorded at the back of dunes at Cemetery Beach and Sutherland Street which suggests that existing lighting along Sutherland Street is causing disorientation to hatchlings attempting to reach the ocean. Lighting associated with new developments must be sensitively designed together with access management during the nesting season.

12) **The Landscape Design** philosophy aims at creating a cool oasis through climate responsive solutions that combine shade, reduced maintenance and water efficiency. Key tools for achieving this include appropriate local plant selection, efficient landscape set out and Xeriscaping; landscaping in ways that reduce or eliminate the need for supplemental water from irrigation.

13) **Given finite potable water** supplies, recycled water should be used where possible particularly for construction, dust suppression and landscape irrigation.

FORESHORE STUDY AREAS

The foreshore has been studied according to the following:

Study Area A - Old Town (West End)

Study Area B - Spoil Bank (West End)

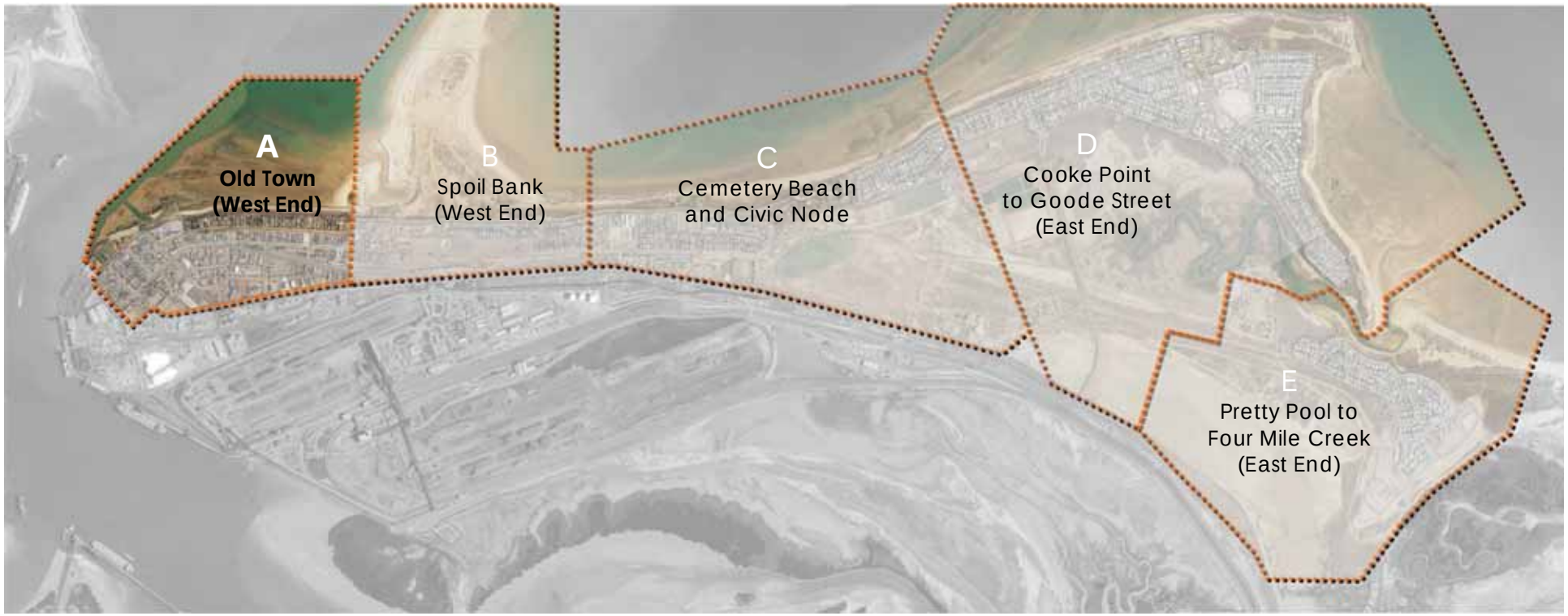
Study Area C - Cemetery Beach and Civic Node

Study Area D - Cooke Point to Goode Street (East End)

Study Area E - Pretty Pool to Four Mile Creek (East End)

Indicative staging for each project area is shown as follows:

- Short term implementation (< 3 years)
- Medium term implementation (3 - 10 years)
- Long term implementation (> 10 years)



STUDY AREA A Opportunities and Directions

The main opportunities for this area include:

- Strengthen the urban core (Wedge Street) and its link to Marapikurrinya Park;
- Dual use pedestrian connections from the Port Hedland Port Authority, along Richardson Street/The Esplanade to Captain Bert Madigan Park and the Spoil Bank;
- Link heritage sites into the pedestrian network; and,
- Improvements to existing parks and re-development of the old boat ramp area.

Art / Interpretation

Views / Foreshore Connections

Pedestrian Connections

Heritage Area

POS Area

Proposed Development

Urban core area

Marapikurrinya Art Space Proposal

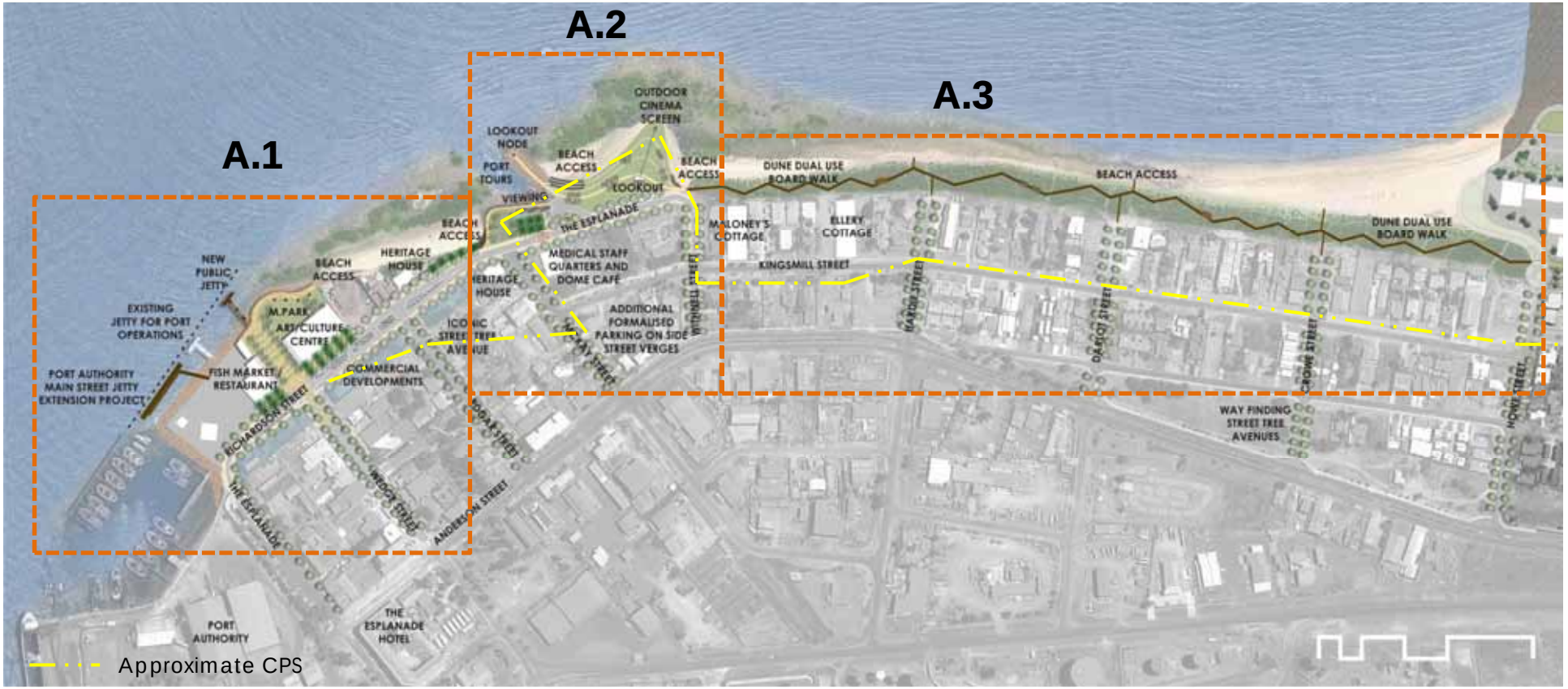
'The Beacon' Multi-Storey Building Proposal

DOME Café Development

FORM Art Precinct Proposal

STUDY AREA A

A.1 Marapikurrinya Park Town Centre Node
A.2 Captain Bert Madigan Park Node
A.3 The Esplanade to Spoil Bank Boardwalk




STUDY AREA A.1
A.1 Marapikurrinya Park Town Centre Node
A.2 Captain Bert Madigan Park Node
A.3 The Esplanade to Spoil Bank Boardwalk
TEMPORARY CINEMA SCREEN
LOOKOUT NODE
BEACH ACCESS
PORT TOURS
SHAPED PARK SPACE
LOOKOUT
BEACH ACCES
SHADED VIEWING
BERT MADIGAN PARK
THE ESPLANADE
BEACH ACCESS
ICONIC FORESHORE TREES
HERITAGE: HARBOUR MASTER'S HOUSE
HERITAGE: MEDICAL STAFF QUARTERS
DOME CAFÉ DEVELOPMENT
HERITAGE: CHARLIE BAYMAN'S HOUSE
PROPOSED ICONIC PUBLIC FISHING JETTY
BEACH ACCESS
PICNIC M.PARK
DESIGNATED CARAVAN PULL-UP BAYS
ADDITIONAL FORMALISED PARKING ON SIDE STREET VERGES
WITHNELL STREET
EXISTING JETTY FOR PORT OPERATIONS
COMMUNITY, ARTS & CULTURE CENTRE
MARKET WALK
MCKAY STREET
COMMERCIAL DEVELOPMENTS
PORT AUTHORITY MAIN STREET JETTY EXTENSION PROJECT
FISH MARKET / RESTAURANTS
STREET TREE AVENUE
RICHARDSON STREET
EDGAR STREET

Jurien Bay Public Jetty

Example of iconic public jetty

Marapikurrinya Park
New Public Fishing and Viewing Jetty

A new iconic public jetty is proposed in Marapikurrinya Park. The proposed jetty would terminate a strong axial link through the market walk to Wedge Street. The jetty could include fishing and fish cleaning facilities, artistic shade shelters, lighting and Integrated Public Art, including interpretation about the significant mangrove systems and/or industry. The jetty would allow the existing jetty and proposed Main Street Public Jetty Extension to be used exclusively by the Port Hedland Port Authority. This separation of public and Port Authority activities would avoid potential conflicts and allow for the jetties to be designed to suit their specific functions.

Geelong Foreshore, Victoria

"Mpark Artspace" proposal, Pracsys 2012

Cable Beach Club, Broome

Marapikurrinya Park
Community, Art and Culture Node

There is an opportunity to revitalise Marapikurrinya Park and activate it with the inclusion of a Community, Culture and Arts building, similar to the 'Marapikurrinya Art Space' proposal. The building could be raised to take advantage of the views with undercover car parking provided at the ground level. The building could open into the surrounding park and possess a strong urban street frontage onto Richardson Street.

Alfresco dining opportunity

Temporary market stalls

Fish Market Wynyard Quarter, Auckland

Seafood Restaurant Opportunity and Market Walk

The Sealanes Building is in a prime location for a restaurant and seafood market.

This seafood restaurant / market, proposed public jetty, community arts and cultural centre and wedge street could all be linked via an open, linear, public space or “Market Walk”. This space could contain temporary market stalls, and allow for the seafood restaurant to open into the space for alfresco dining opportunities.

South Hedland Town Centre

Pedestrian prioritisation, Rouse Hill, NSW

Pedestrian Prioritised Connection Wedge Street to Public Jetty

The West End is proposed as Port Hedland's urban commercial and entertainment hub, with a focus on the pedestrian experience and commercial opportunities.

There is an opportunity to create a strong pedestrian connection between Port Hedland's main commercial street, Wedge Street and the revitalised Marapikurrinya Park.

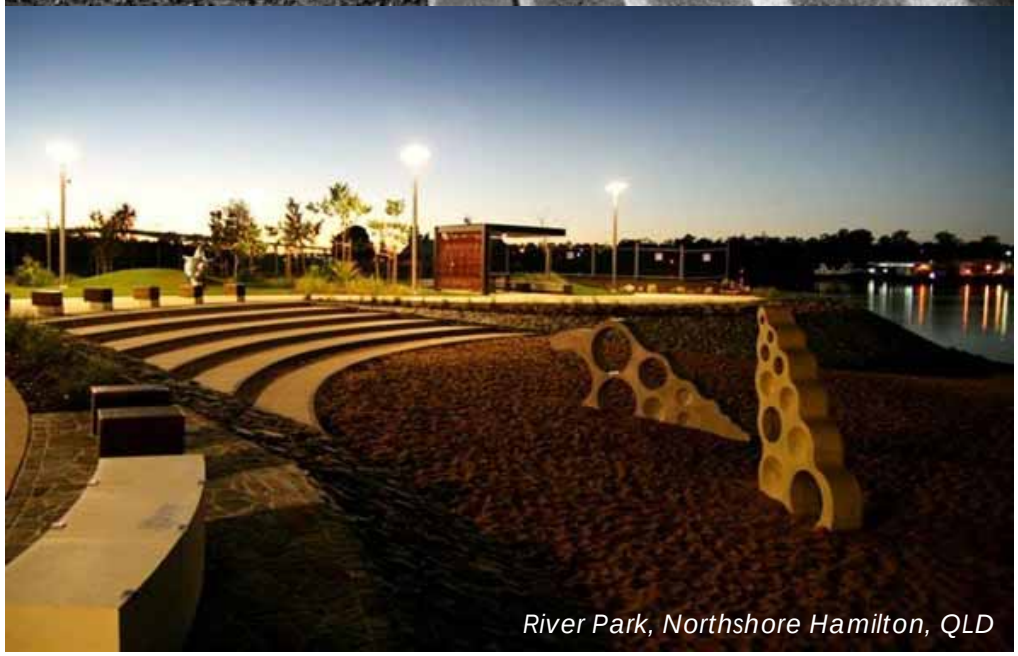
MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
Marapikurrinya Park Area; o Art, Culture and Community Node; o Tourism; o Restaurant; and o Jetty Amenities	Seaward of CPS	Protect	o Implement a protection scheme; o Potential for construction of coastal protective structures, or allowing space for their future construction; o Given the current infrastructure in the area, there is likely to be long-term commitment to a high level of development in the area to justify the long-term costs; o There are compelling reasons why this area rather than a less vulnerable, higher elevation area nearby should attract continued development and occupation e.g. it is more cost effective due to established Town Centre in this area; o The development (Art/Culture/Community Center) can be located back from the headland edge and designed so that it can be appropriately protected from inundation and coastal erosion risks; o Particular construction methods or materials can reduce the consequences of inundation and/or reduce the costs of relocation of some elements; and, o Other elements including picnic facilities, shelters, BBQ etc can be removed, relocated or modified should it be threatened by erosion in the future.


STUDY AREA A.2
A.1 Marapikurrinya Park Town Centre Node
A.2 Captain Bert Madigan Park Node
A.3 The Esplanade to Spoil Bank Boardwalk
TEMPORARY CINEMA SCREEN
LOOKOUT NODE
PORT TOURS
BEACH ACCESS
SHAPED PARK SPACE
LOOKOUT
BEACH ACCESS
DUAL USE BOARD WALK ON DUNES
LOOKOUT REST STOPS
SHADED VIEWING
BERT MADIGAN PARK
THE ESPLANADE
BEACH ACCESS
HERITAGE; MALONEY'S COTTAGE
HERITAGE; ELLERY COTTAGE
HERITAGE; MEDICAL STAFF QUARTERS
DOME CAFÉ DEVELOPMENT
KINGSMILL STREET
HERITAGE; CHARLIE BAYMAN'S HOUSE
ADDITIONAL FORMALISED PARKING ON SIDE STREET VERGES
WITHNELL STREET
ADDITIONAL FORMALISED PARKING ON SIDE STREET VERGES
Approximate CPS

Delonix regia, Pretty Pool Park

Iconic Tree Planting and Shaded Pedestrian Paths

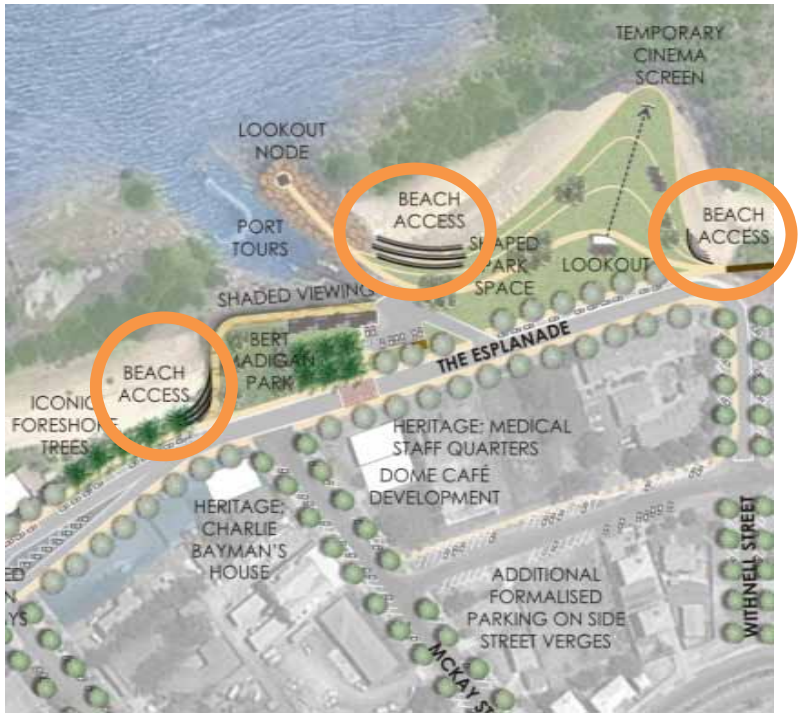
Tree lined recreation routes create shade and visual amenity. Dense groups of tall iconic trees along the foreshore path route and at points of interest also create visual cues, highlighting the foreshore and promoting its associated amenity.



River Park, Northshore Hamilton, QLD

Beach Access

Defined access to the beach allows for a close connection with the ocean and the coastal environment. Proposed access in the form of robust concrete steps or similar, to withstand local coastal processes and provide seating opportunities.



Ship viewing

Shade structure, Scarborough Beach

Shaded Viewing and Seating

The provision of shade is an important consideration for urban design in the Pilbara. A number of opportunities exist for shaded rest and seating locations with views out to the ocean.

Captain Bert Madigan Park could be upgraded to include a pedestrian boardwalk edge and a stepped seating wall that allows ocean views E.g. watching Port vessel activities.

Riverside Park, Port of Brisbane

Coastal Creeper – Canavalia rosea

Bradley's Head, Mosman, NSW

Public Open Space with Direct Beach Access

There is an opportunity to create a public open space in the existing boat ramp car park. A shaded space would provide a green public open space amenity in the West End that is connected to the revitalised Bert Madigan Park. It is proposed that the former car park area be shaped to allow for beach access. The space could be further activated by the Port Tours from the Boat Ramp adjacent and the Dome Café opposite. In addition, the multi-use space may include shaded picnic areas, temporary outdoor cinema screen, groyne lookout and tower lookout, car park and on street parking.

Viewing Tower, Eindhoven

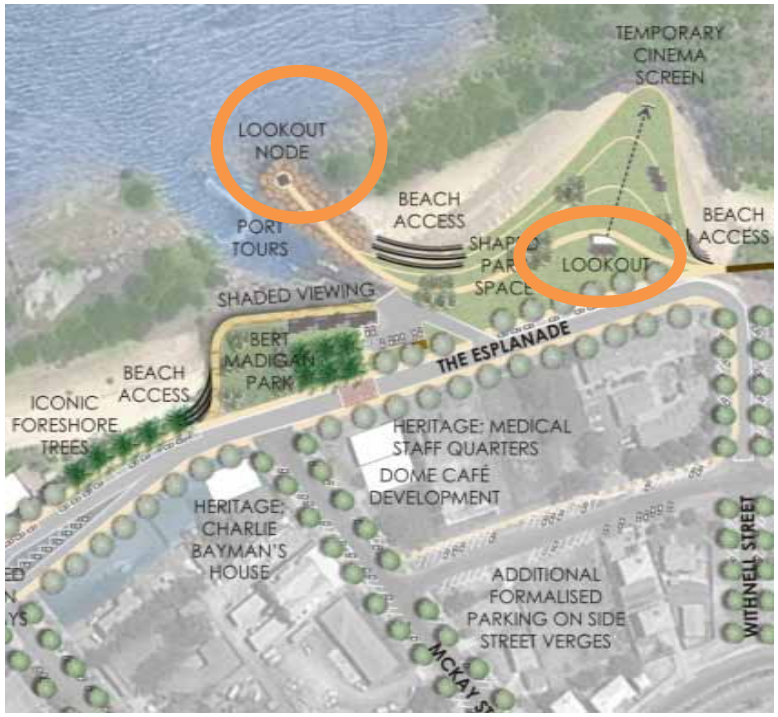
Third Wave Kiosk, Torquay

Mill Street Lookout, Sydney

Lookouts Nodes (Multiuse; Kiosk, Port Tour Tickets, Interpretation)

A proposed recreational lookout in the public open space would provide expansive views of the coastline and port activities. The lookout building could be artistically designed and also include multiuse opportunities such as a small kiosk and Port Tour/Outdoor cinema ticket shop.

The proposed groyne lookout would be a key rest stop node along the foreshore recreation route and provide another connection to the water, further promoting Port Hedland's unique coastal environment and port activity.



Temporary / Seasonal Screen

Outdoor cinema

Seasonal Outdoor Cinema Space

An opportunity exists for a temporary outdoor cinema screen to be located seasonally in the Bert Madigan Boat Ramp Car Park POS area. The location allows scenic views beyond to port activities.

Port Hedland's climate during the dry season would suit night time outdoor activity, and locating this activity on the foreshore adds the interest of the port, industrial lights and natural beauty of the ocean and coast.

"The Beacon" proposal, Willcox

'The Beacon' Proposal or Similar Building Concept

A proposal exists for a large multi-purpose development "The Beacon", on the boat ramp car park site. The feasibility of this project may be unlikely if the Spoil Bank Marina and Development Project proceeds.

The building design allows for open areas around the building which can act as boardwalks and viewing platforms connecting into the strengthened dual use foreshore path route. This would allow "The Beacon" to become a key amenity within the connected foreshore.

MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
Captain Bert Madigan Park Node; o The existing Boat Ramp o Proposed Boat Ramp Car Park Public Open Space	On the CPS	Accommodate	o Raise the lookout and other infrastructure to avoid inundation and flooding and have lower portions of structures constructed of flood resistant materials and are designed to withstand water forces; o Any buildings/lookouts are proposed to be developed on the least hazardous portion of the site; o Reducing the footprint of the proposed building, and shifting the footprint away from the hazard; o Opportunity to modify the lookout building design and site development to facilitate future relocation of the building; o Altering the site to reduce its risk to coastal hazards; o Permit development of temporary or low value assets e.g. picnic facilities, temporary/removable cinema screen, shade structures. (Not permitting development of high value assets (community centers, schools, hospitals) etc in the West End and therefore only suggest 'The Beacon' or similar building as Option B for this site); and, o The POS area and elements can be designed to be durable and effective for the estimated time period and/or have reasonably maintenance and operating costs for the design period.

STUDY AREA A.3

A.1 Marapikurrinya Park Town Centre Node
A.2 Captain Bert Madigan Park Node
A.3 The Esplanade to Spoil Bank Boardwalk

Boardwalk with rest area

GASP Boardwalk, Hobart

Dual use boardwalk with beach access and rest / lookout areas

Public exposure to the foreshore is currently restricted from the end of The Esplanade to Sutherland Street by private properties.

An opportunity exists to connect The Esplanade and Sutherland Street via a dual use boardwalk through the dunes.

This boardwalk could incorporate beach access, shaded rest areas and mid-way access points at the ends of Darlot Street, Hardie Street and Crowe Street.

This would be an important aspect in creating a continuous, connected, high amenity foreshore.

MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
The Esplanade to the Spoil Bank; o Dual Use Board Walk Link o Sun Shade Shelters o Lookout Points	Seaward of CPS	Accommodate	o Design the boardwalks to withstand inundation; o Permit development of temporary or low value assets (boardwalk); and, o Design temporary or re-locatable structures

FORESHORE STUDY AREAS

Study Area A - Old Town (West End)

Study Area B - Spoil Bank (West End)

Study Area C - Cemetery Beach and Civic Node

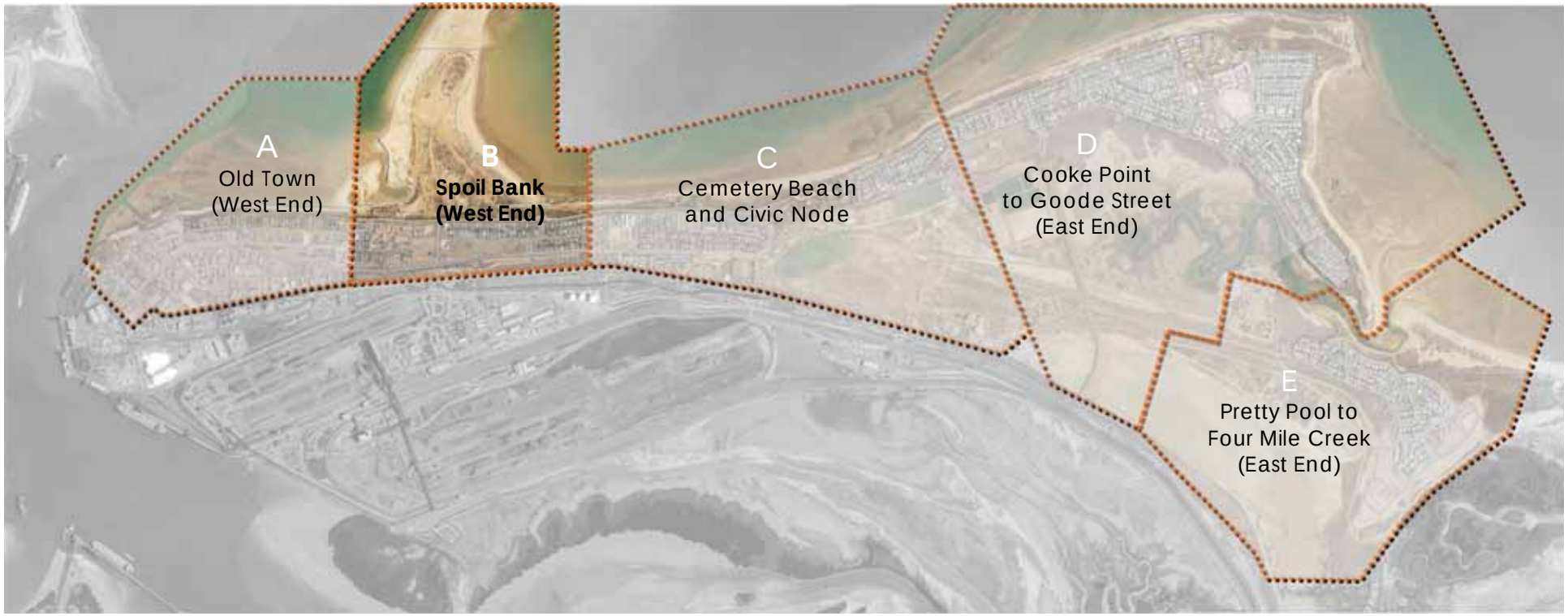
Study Area D - Cooke Point to Goode Street (East End)

Study Area E - Pretty Pool to Four Mile Creek (East End)

Short term implementation (< 3 years)

Medium term implementation (3 - 10 years)

Long term implementation (> 10 years)



STUDY AREA B

Opportunities and Directions

- Formalised vehicle access
- Connectivity and formalised pedestrian access
- Connectivity to local Heritage sites
- Increased Amenity (Shade, Picnic Facilities etc.)
- Revegetation
- Opportunity for site sensitive iconic artwork on the tip of the Spoil Bank

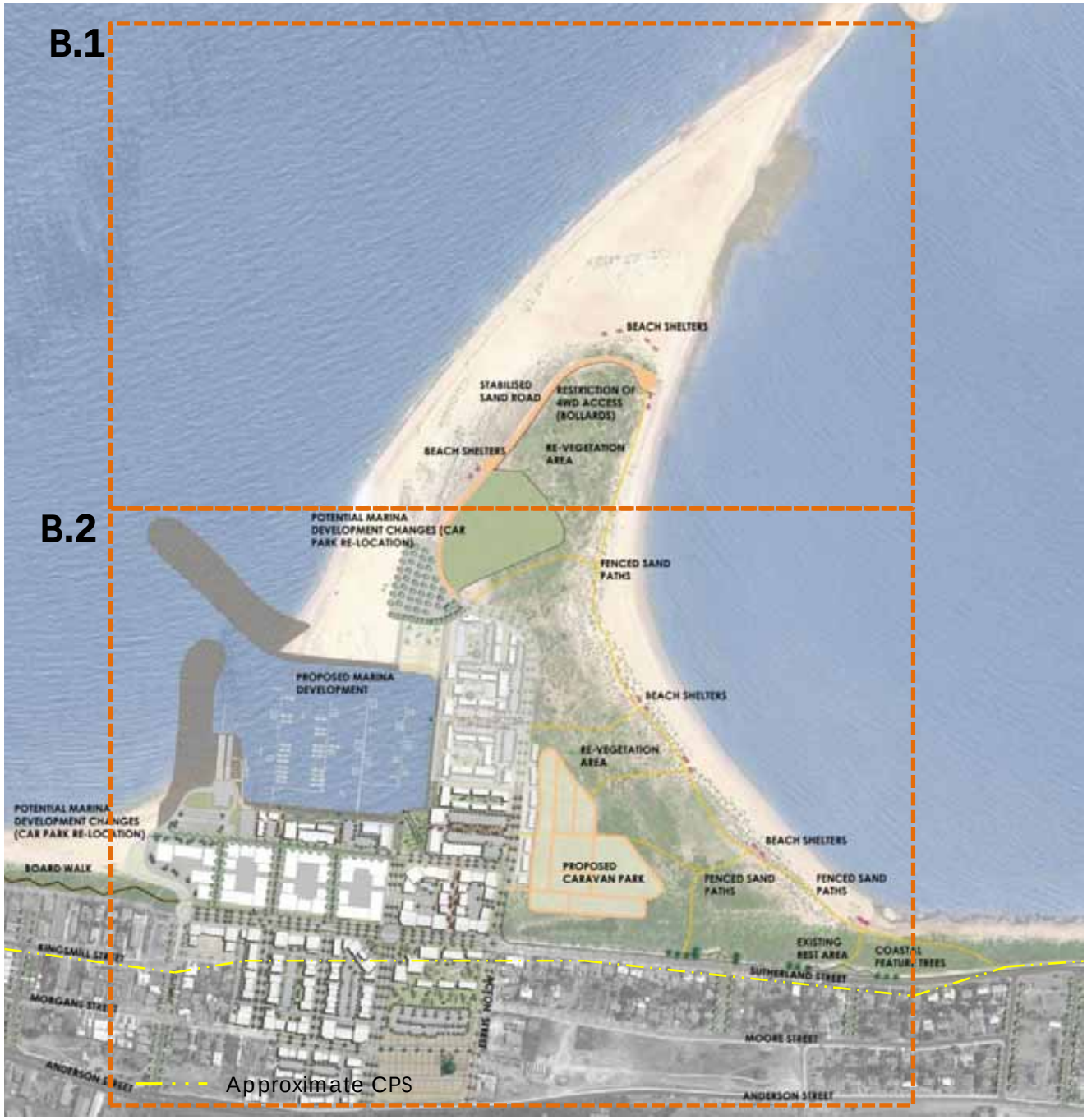
Art / Interpretation

Views / Foreshore Connections

Pedestrian Connections

Heritage Area

POS Area



STUDY AREA B

B.1 The Spoil Bank
B.2 The Spoil Bank Marina and Development

STUDY AREA B.1

B.1 The Spoil Bank
B.2 The Spoil Bank Marina and Development

Art Opportunity

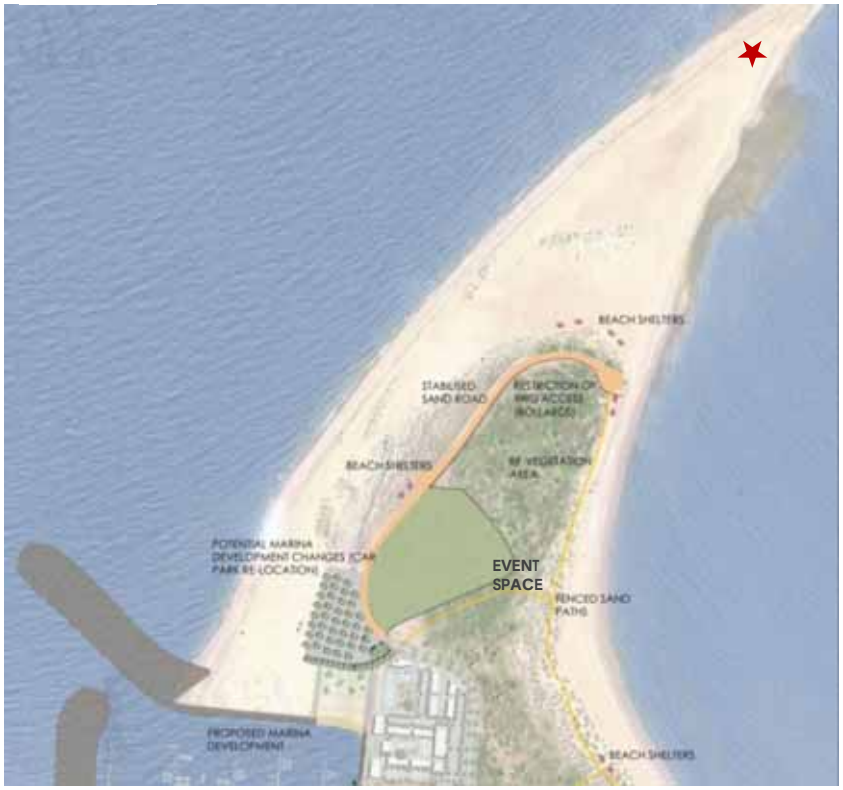
Defined access through vegetation areas

Beach Shelters

The Spoil Bank

An alteration of the existing stabilised vehicle track is proposed into a cul de sac form, rather than the existing loop. To the south and east of this track off-road vehicle restriction is proposed to allow the area to become a vegetated, safe zone for pedestrians with defined pedestrian paths and beach-side picnic shelters.

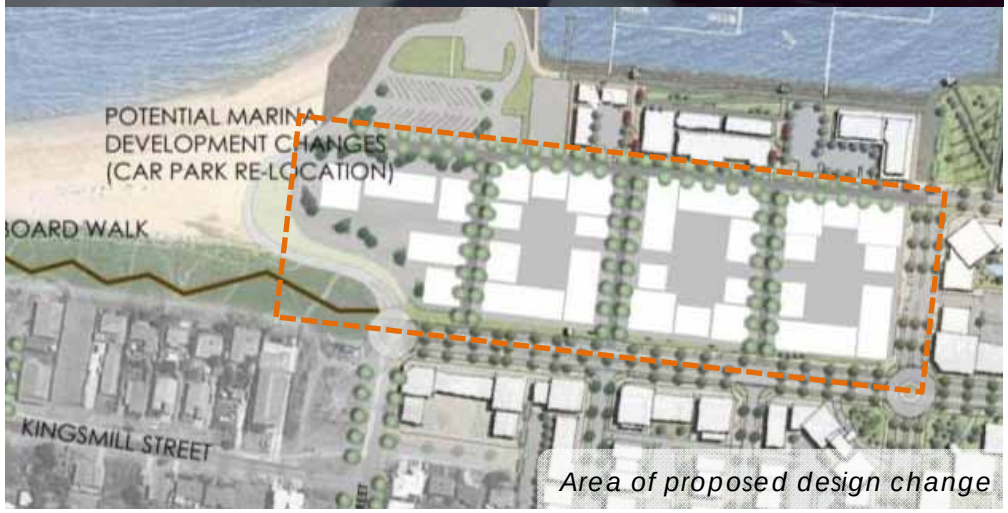
To the north and west of this track only low key beach shelters and a potential art piece are proposed to allow this area (the end of the bank) to retain its current, distinct character.



STUDY AREA B.2

B.1 The Spoil Bank
B.2 The Spoil Bank Marina and Development

Mixed use streetscape, Rouse Hill, NSW

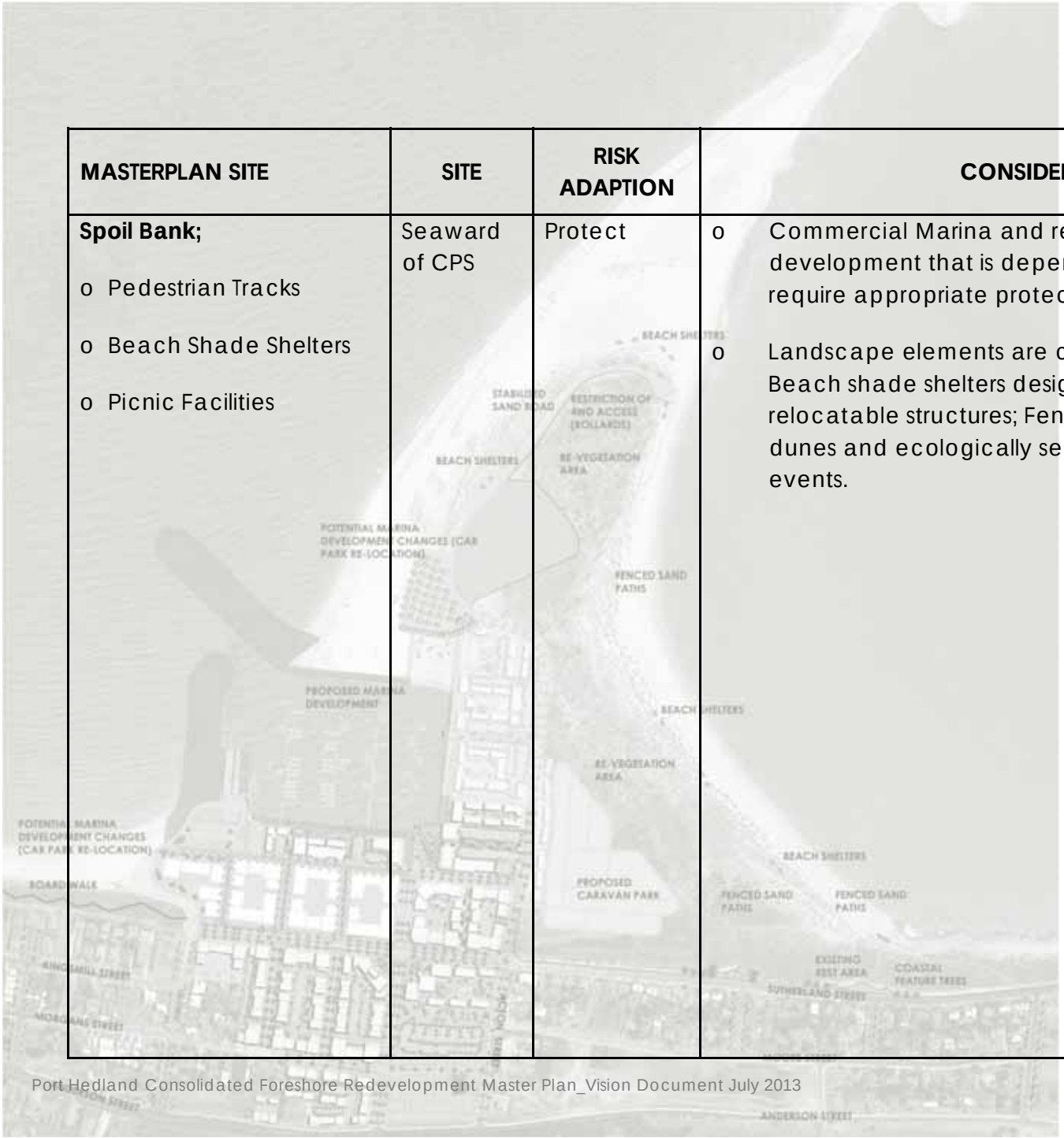


Area of proposed design change

The Marina Development

To continue the connection of amenity along the foreshore, an alteration to the proposed marina development design is proposed. Relocation of the extensive car park from the foreshore, and replacement with a commercial development to address Sutherland Street would continue foreshore amenity through this area. An opportunity exists for a dual use pedestrian / cycle connection from The West End, through the marina development and on to cemetery beach park and beyond through dual use boardwalks and paths, with continuous amenity along the route.

MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
Spoil Bank; o Pedestrian Tracks o Beach Shade Shelters o Picnic Facilities	Seaward of CPS	Protect	o Commercial Marina and recreational boating facilities development that is dependent on the foreshore location will require appropriate protection structures; and, o Landscape elements are coastally dependent and include Beach shade shelters designed to be temporary, easily relocatable structures; Fencing, for the purposes of protecting dunes and ecologically sensitive areas and facilities for public events.



FORESHORE STUDY AREAS

Study Area A - Old Town (West End)

Study Area B - Spoil Bank (West End)

Study Area C - Cemetery Beach and Civic Node

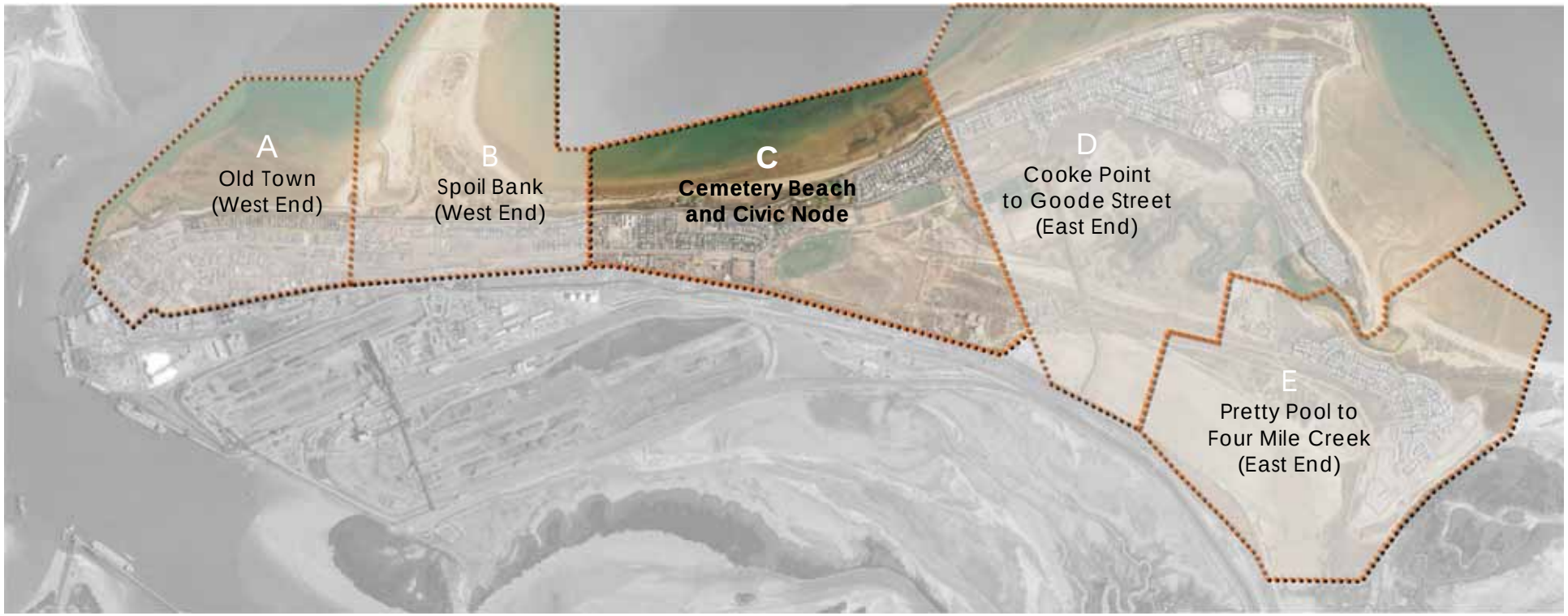
Study Area D - Cooke Point to Goode Street (East End)

Study Area E - Pretty Pool to Four Mile Creek (East End)

Short term implementation (< 3 years)

Medium term implementation (3 - 10 years)

Long term implementation (> 10 years)



STUDY AREA C Opportunities and Directions

- Retain views to the ocean
- Strong Streetscape Character and Way Finding Cues e.g. Trees, Interpretation/Art
- Connectivity of adjacent nodes and functions E.g. Hotel, Water Towers and Civic
- Renourishment of turtle beach sand
- Revegetation of dunes

Art / Interpretation

Views / Foreshore Connections

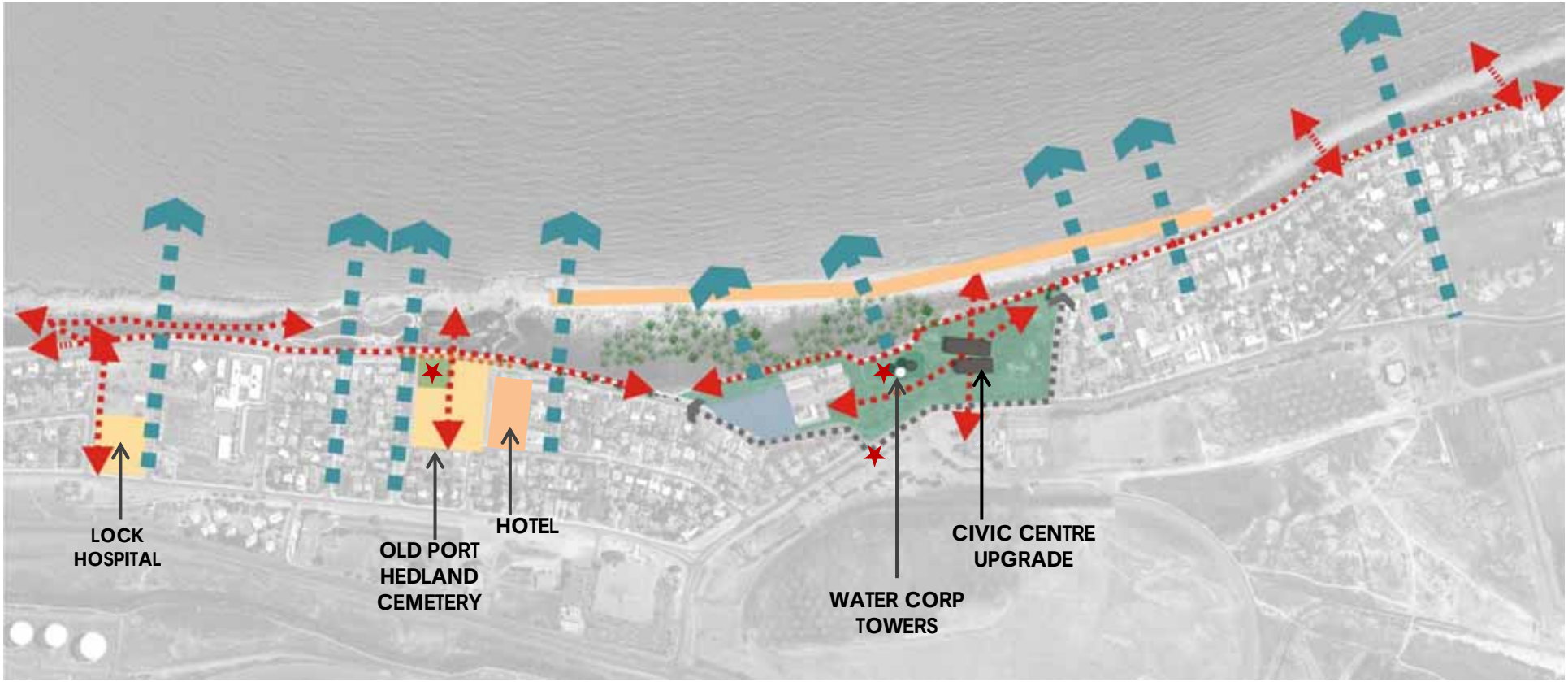
Pedestrian Connections

Heritage Area

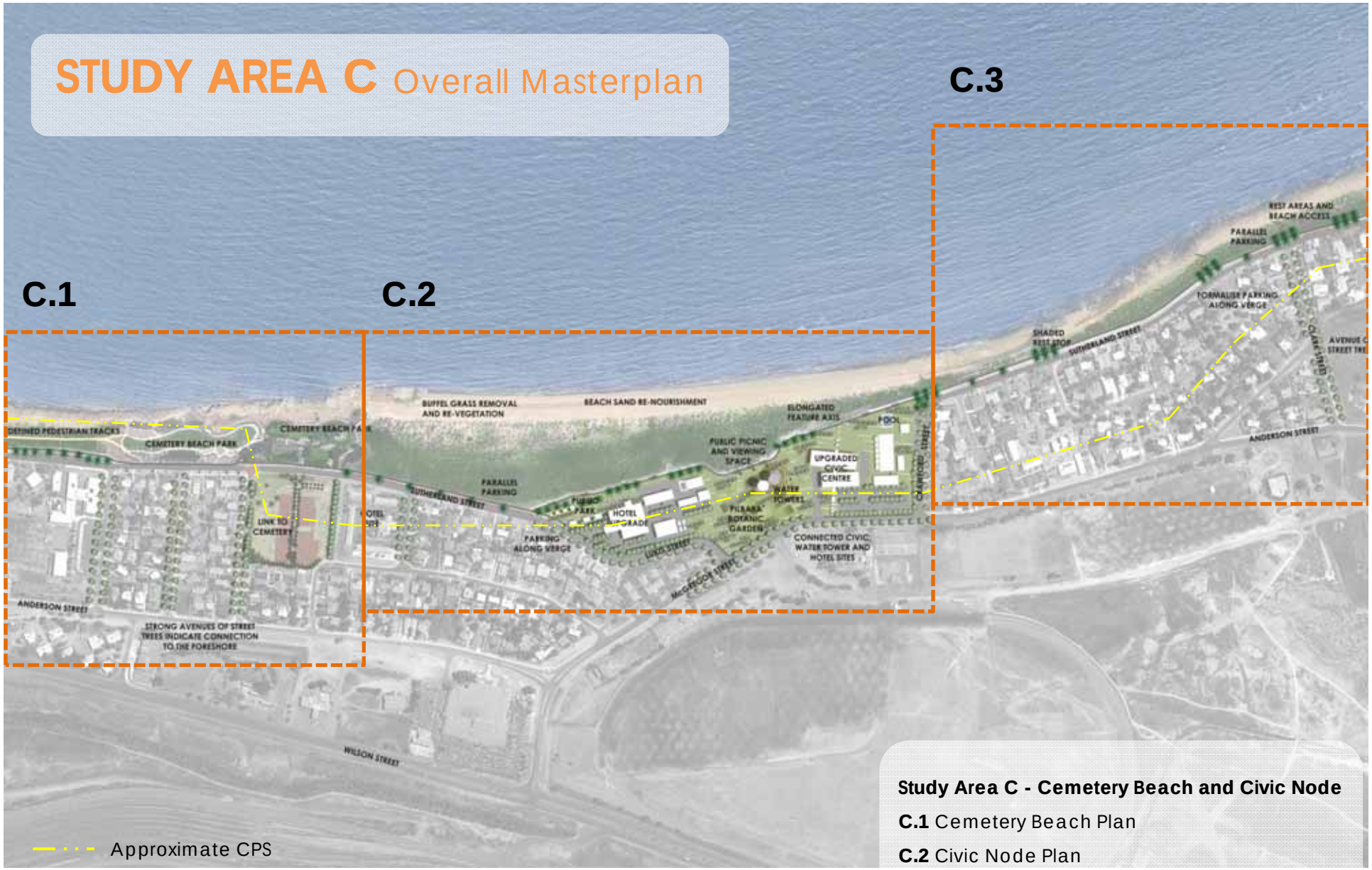
POS Area

Turtle nesting beach

Proposed development



STUDY AREA C Overall Masterplan



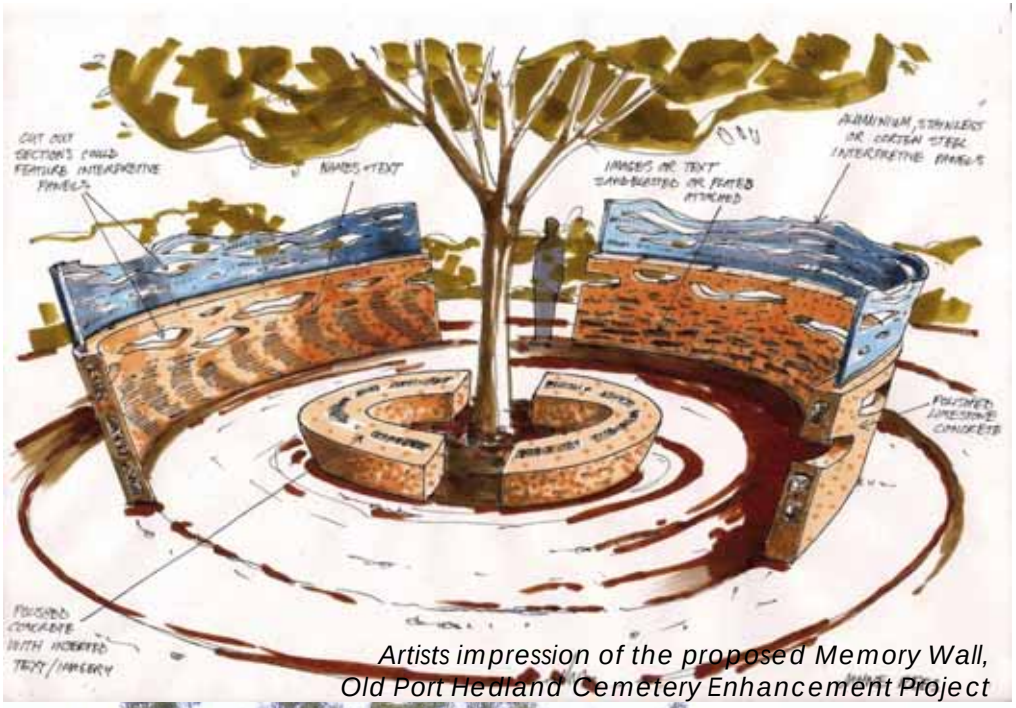
Study Area C - Cemetery Beach and Civic Node

C.1 Cemetery Beach Plan

C.2 Civic Node Plan

C.3 Sutherland Street


DEFINED PEDESTRIAN TRACKS
REST NODE
CEMETERY BEACH PARK
CEMETERY BEACH PARK
SUTHERLAND STREET
LINK TO CEMETERY
HOTEL SITE
ANDERSON STREET
STRONG AVENUES OF STREET TREES INDICATE CONNECTION TO THE FORESHORE
STUDY AREA C.1
C.1 Cemetery Beach
C.2 Civic Node Plan
C.3 Sutherland Street
Approximate CPS



Artists impression of the proposed Memory Wall, Old Port Hedland Cemetery Enhancement Project

Old Port Hedland Cemetery

The Old Port Hedland Cemetery

The Old Port Hedland Cemetery Enhancement Project proposes to enhance the importance and attraction of the cemetery as a key site in celebrating the rich history of the town and its people.

An opportunity exists to connect this important site with the proposed foreshore amenity particularly with the popular Cemetery Beach Park.

A pedestrian prioritised crossing of Sutherland Street would draw visitors into the cemetery and promote it as a key destination along the foreshore, in turn promoting the towns rich cultural history to visitors.

MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
Cemetery Beach	On the CPS	Protect	o This is a public recreation development with a finite lifespan. Elements can be removed or modified should it be threatened by erosion or creates an erosion threat to other land; o Requirement for disclosure of hazards/vulnerability, eg. notification on title regarding vulnerable break through area during major storm surge area; o Implementation of a protection scheme e.g. Groyne, flood/sea walls or armor wall at break through point ; o Beach nourishment or replenishment along Cemetery Beach; o Dune management and revegetation; o There is likely to be long-term commitment to a high level of development in the area due to new residential developments proposed in flood zone (e.g. McGreggor Street) thus justify the long-term costs; o There are compelling reasons why this area rather than a less vulnerable, higher elevation areas nearby should attract continued development and occupation; and, o Emergency management.


BEACH SAND RE-NOURISHMENT
ELONGATED FEATURE AXIS
POOL
SHADED REST STO
PUBLIC PICNIC AND VIEWING SPACE
BUFFEL GRASS REMOVAL AND RE-VEGETATION
UPGRADED CIVIC CENTRE
CRAWFORD STREET
WATER TOWERS
PARALLEL PARKING
PUBLIC PARK
HOTEL UPGRADE
PILBARA BOTANIC GARDEN
PARKING ALONG VERGE
CONNECTED PRECINCT- CIVIC, WATER TOWER AND HOTEL SITES INTERACT
LUKIS STREET
McGREGOR STREET
Approximate CPS
STUDY AREA C.2
C.1 Cemetery Beach
C.2 Civic Node
C.3 Sutherland Street

Cable Beach Club, Broome

Cable Beach Club, Broome

Hotel Redevelopment

An opportunity exists to upgrade the existing hotel site to include a foreshore park. The popularity of the Cemetery Beach Park suggests the viability of a foreshore park in this area.

The design of the hotel could open onto this park creating an alfresco or beer garden area with views to the coast. An example of this style of development is Cable Beach Club in Broome.

Koombana Lookout Botanic Gardens

The proposed public park that starts near the Hotel can extend through the Koombana Lookout site to the civic centre and swimming pool. Potentially this park, surrounding the existing and proposed new water towers, could be a “Plants of the Pilbara Botanic Garden” promoting the natural beauty of the region.

The landmark water towers could potentially be transformed into unique and iconic Port Hedland works of art.

Civic centre upgrade, scenario 2B and 3, Cox Howlett and Bailey Woodland

Civic Centre Upgrade

The Port Hedland Civic Centre upgrade proposal would enhance the foreshore adding to its aesthetics and amenity.

An opportunity exists to better relate the building to the landscape by continuing the central feature axis out into the landscape to McGregor Street (as shown in the plan below). This would create a strong, grand entry to the building and improve the sense of arrival to this important civic centre, particularly on the McGregor Street entrance where a large car park is currently proposed.

MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
Civic Node	Seaward of CPS	Protect	o Requirement for disclosure of hazards/vulnerability; o Implement a protection scheme; o Investigate beach nourishment or replenishment; o Undertake dune management; o Potential for construction of coastal protective structures, or allowing space for their future construction e.g. flood, sea walls, groynes, breakwaters or reefs; o There is likely to be long-term commitment to a high level of development in the area to justify the long-term costs; o Due to its high site location and proximity to the CPS, the area will remain ultimately defendable; o Design and site development to afford appropriate protection from risks and impacts such as inundation and coastal erosion; and, o Construction methods or materials that reduce the consequences of inundation and/or reduce the costs of relocation.


STUDY AREA C.3
C.1 Cemetery Beach Plan
C.2 Civic Node Plan
C.3 Sutherland Street
REST AREAS AND BEACH ACCESS
PARALLEL PARKING
FORMALISE PARKING ALONG VERGE
SHADED REST STOP
SUTHERLAND STREET
CLARK STREET
AVENUE OF STREET TREES
ANDERSON STREET
Approximate CPS

Sutherland Street

Shaded, Formal On-Street Parking

Cottesloe Formalised Car Bays

Sutherland Street

Car parking along Sutherland Street can be formalised with bays identified by a change of asphalt colour. An example of this is Marine Terrace in Cottesloe (image bottom left).

Another opportunity includes defining angle parking along the south verge of Sutherland Street and providing occasional defined parallel bays along the north verge of Sutherland Street so as not to interrupt views.

FORESHORE STUDY AREAS

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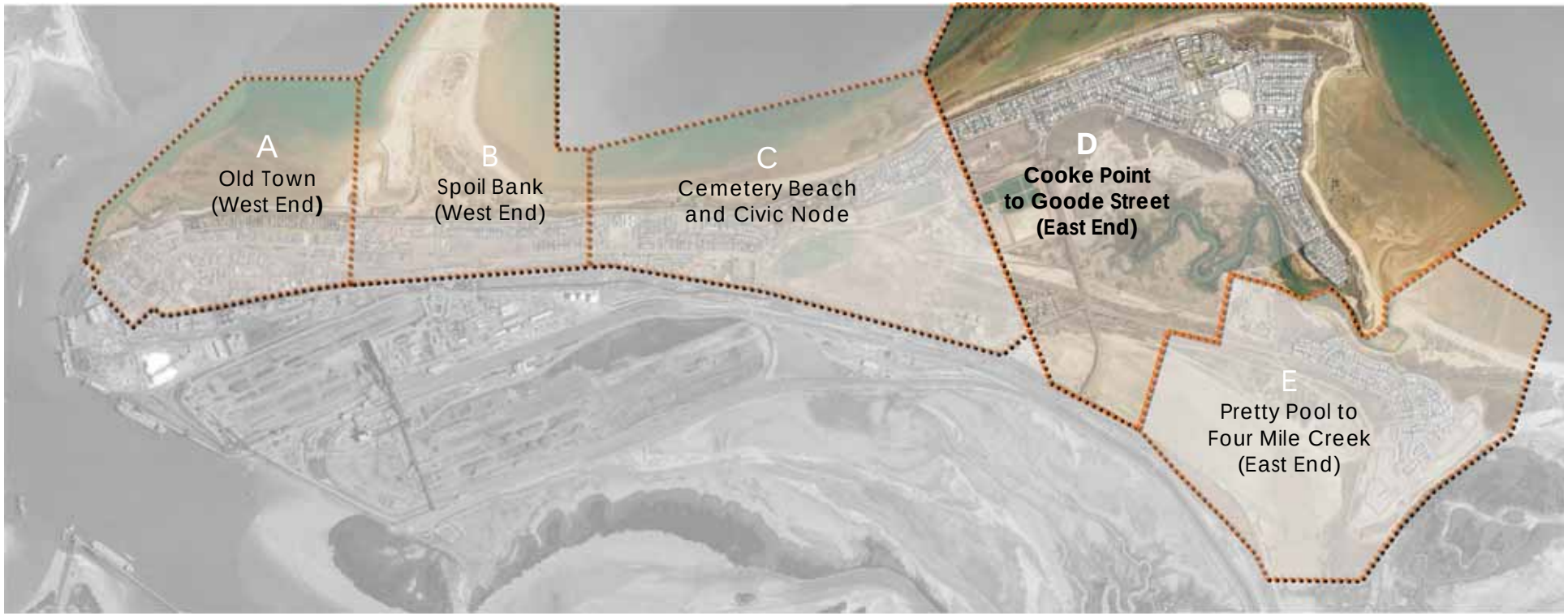
Study Area E - Pretty Pool to Four Mile Creek (East End)

Short term implementation (< 3 years)

Medium term implementation (3 - 10 years)

Long term implementation (> 10 years)



STUDY AREA D Opportunities and Directions

- Retain views to the ocean
- Strong streetscape character and way finding cues E.g. Trees & art
- Continuous pedestrian connectivity
- Residential focus and opportunities for new development
- Formalise street parking

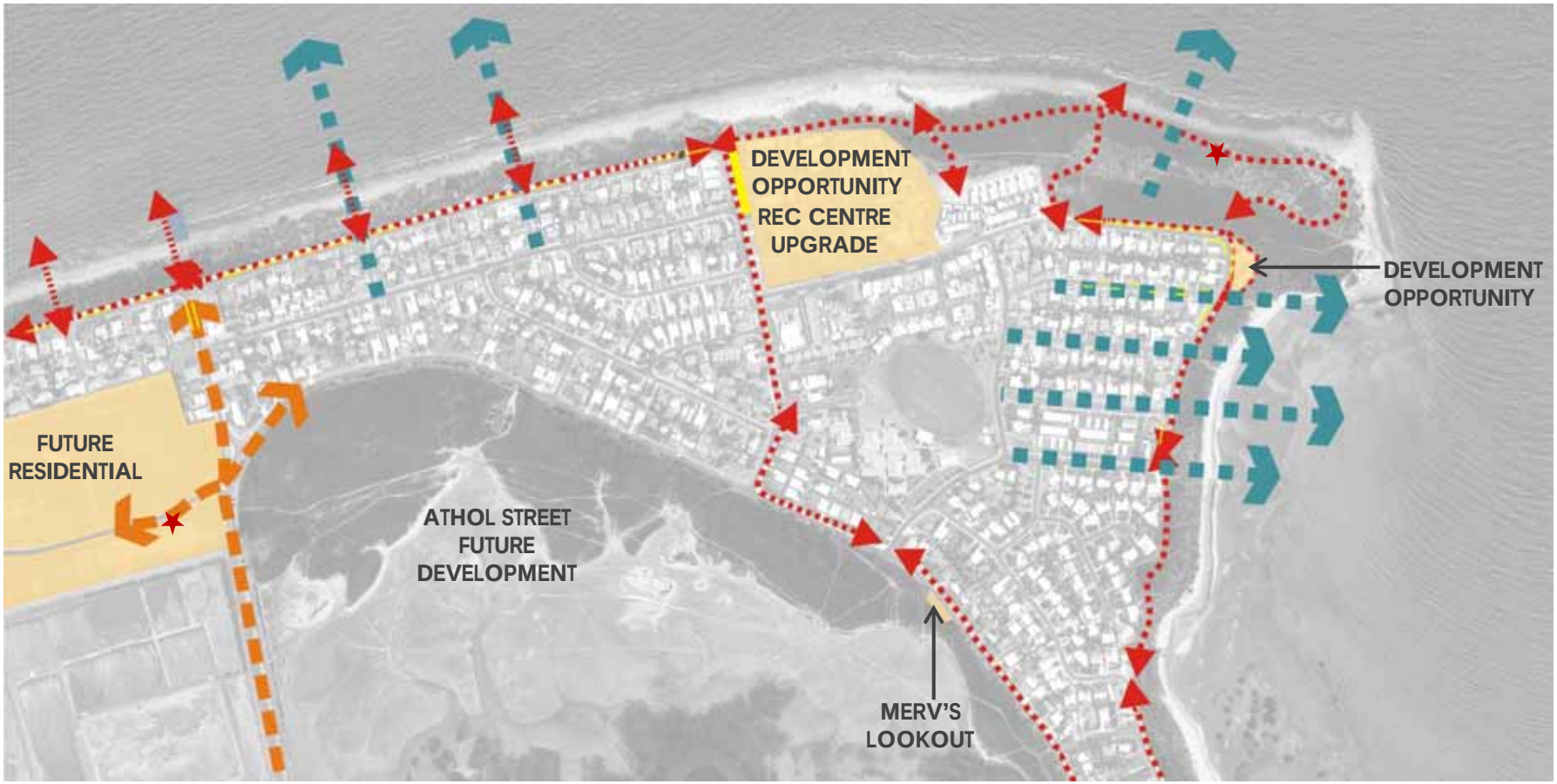
Art / Interpretation

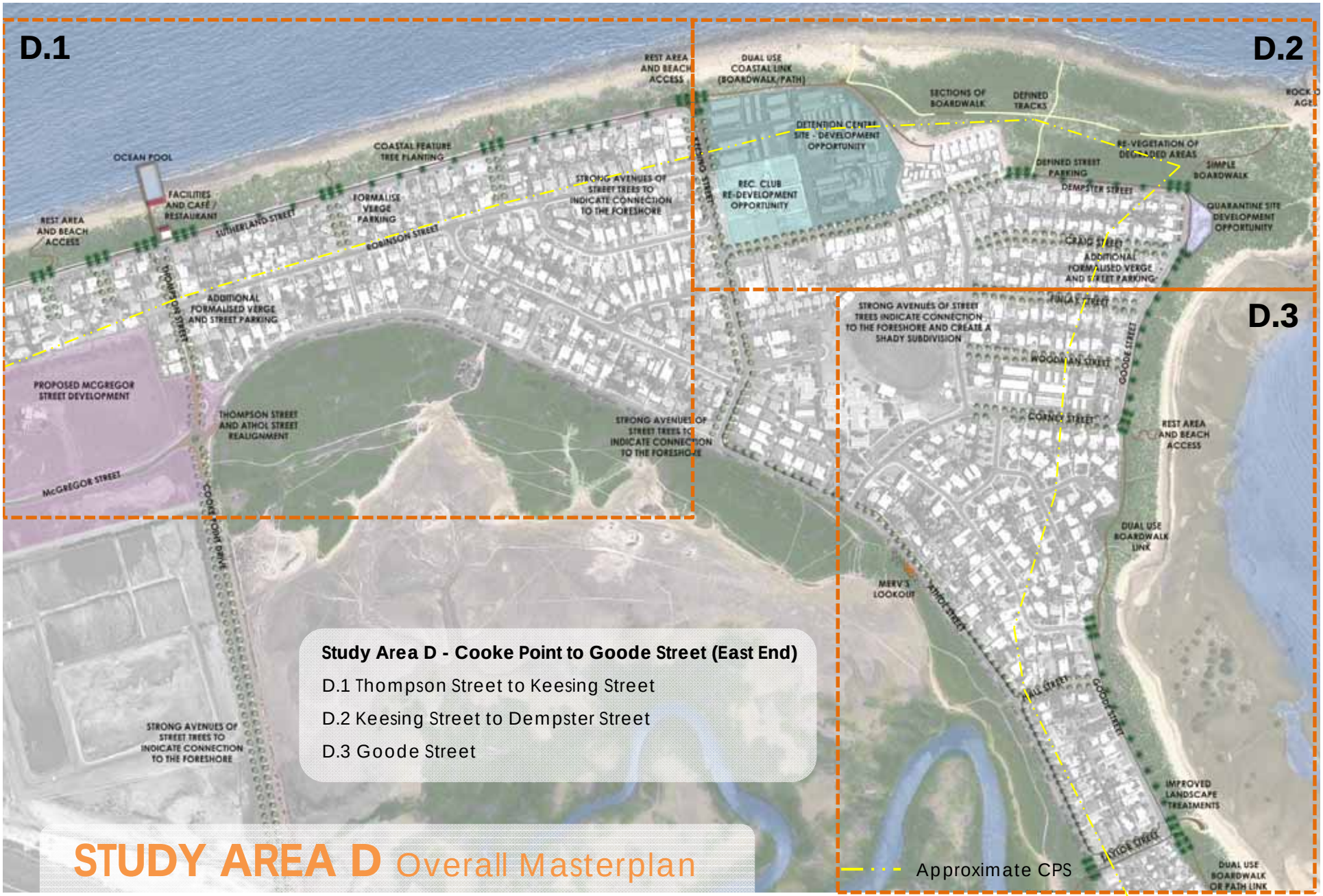
Views / Foreshore Connections

Pedestrian Connections

Potential Development Area

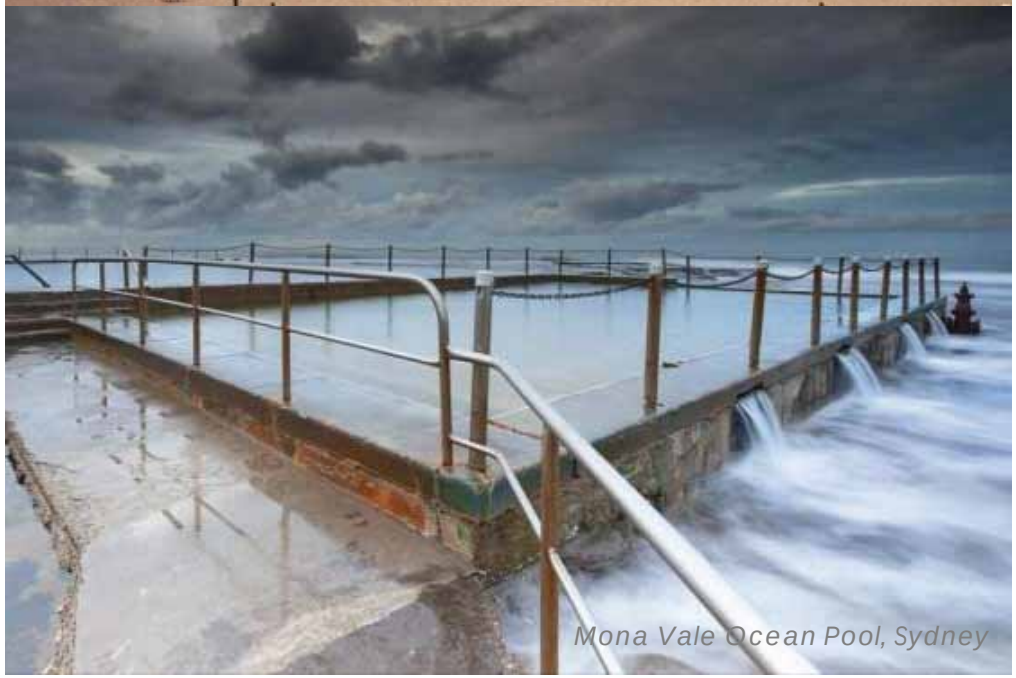
Road Re-alignment Opportunity




D.1
D.2
D.3
REST AREA AND BEACH ACCESS
OCEAN POOL
FACILITIES AND CAFE / RESTAURANT
COASTAL FEATURE TREE PLANTING
FORMALISE VERGE PARKING
SUTHERLAND STREET
ROBINSON STREET
STRONG AVENUES OF STREET TREES TO INDICATE CONNECTION TO THE FORESHORE
ADDITIONAL FORMALISED VERGE AND STREET PARKING
THOMPSON STREET
PROPOSED MCGREGOR STREET DEVELOPMENT
McGREGOR STREET
THOMPSON STREET AND ATHOL STREET REALIGNMENT
COOKE POINT DRIVE
DUAL USE COASTAL LINK (BOARDWALK/PATH)
SECTIONS OF BOARDWALK
DEFINED TRACKS
DETENTION CENTRE SITE - DEVELOPMENT OPPORTUNITY
REC. CLUB RE-DEVELOPMENT OPPORTUNITY
KEESING STREET
RE-VEGETATION OF DEGRADED AREAS
DEFINED STREET PARKING
DEMPSTER STREET
SIMPLE BOARDWALK
QUARANTINE SITE DEVELOPMENT OPPORTUNITY
CRAIG STREET
ADDITIONAL FORMALISED VERGE AND STREET PARKING
STRONG AVENUES OF STREET TREES INDICATE CONNECTION TO THE FORESHORE AND CREATE A SHADY SUBDIVISION
WOODMAN STREET
GOODE STREET
CORNEY STREET
REST AREA AND BEACH ACCESS
DUAL USE BOARDWALK LINK
MERV'S LOOKOUT
ATHOL STREET
IMPROVED LANDSCAPE TREATMENTS
DUAL USE BOARDWALK OR PATH LINK
Approximate CPS
Study Area D - Cooke Point to Goode Street (East End)
D.1 Thompson Street to Keesing Street
D.2 Keesing Street to Dempster Street
D.3 Goode Street
STUDY AREA D Overall Masterplan


REST AREA AND BEACH ACCESS
OCEAN POOL
COASTAL FEATURE TREE PLANTING
KEESING STREET
FACILITIES AND CAFÉ / RESTAURANT
FORMALISE VERGE PARKING
STRONG AVENUES OF STREET TREES TO INDICATE CONNECTION TO THE FORESHORE
REST AREA AND BEACH ACCESS
SUTHERLAND STREET
ROBINSON STREET
THOMPSON STREET
ADDITIONAL FORMALISED VERGE AND STREET PARKING
PROPOSED MCGREGOR STREET DEVELOPMENT
THOMPSON STREET AND ATHOL STREET REALIGNMENT
STRONG AVENUES OF STREET TREES TO INDICATE CONNECTION TO THE FORESHORE
McGREGOR STREET
COOKE PO
Approximate CPS
STUDY AREA D.1
D.1 Thompson Street to Keesing Street
D.2 Keesing Street to Dempster Street
D.3 Goode Street


Saint Malo, France


Mona Vale Ocean Pool, Sydney

Ocean Pool

Ocean swimming is currently limited in Port Hedland, and given the climate, providing safe, pleasant swimming opportunities could be very popular amongst local residents.

An ocean pool could be an iconic feature of Port Hedland and could take advantage of its popularity by including commercial opportunities such a café or restaurant.

The proposed location of the ocean pool would be determined by the sites shoreline character, close vicinity to large future and existing residential areas, and its position at the terminus of Cooke Point Drive / Thompson Street. This type of proposal would require detailed feasibility studies by coastal engineers.

Defined beach access

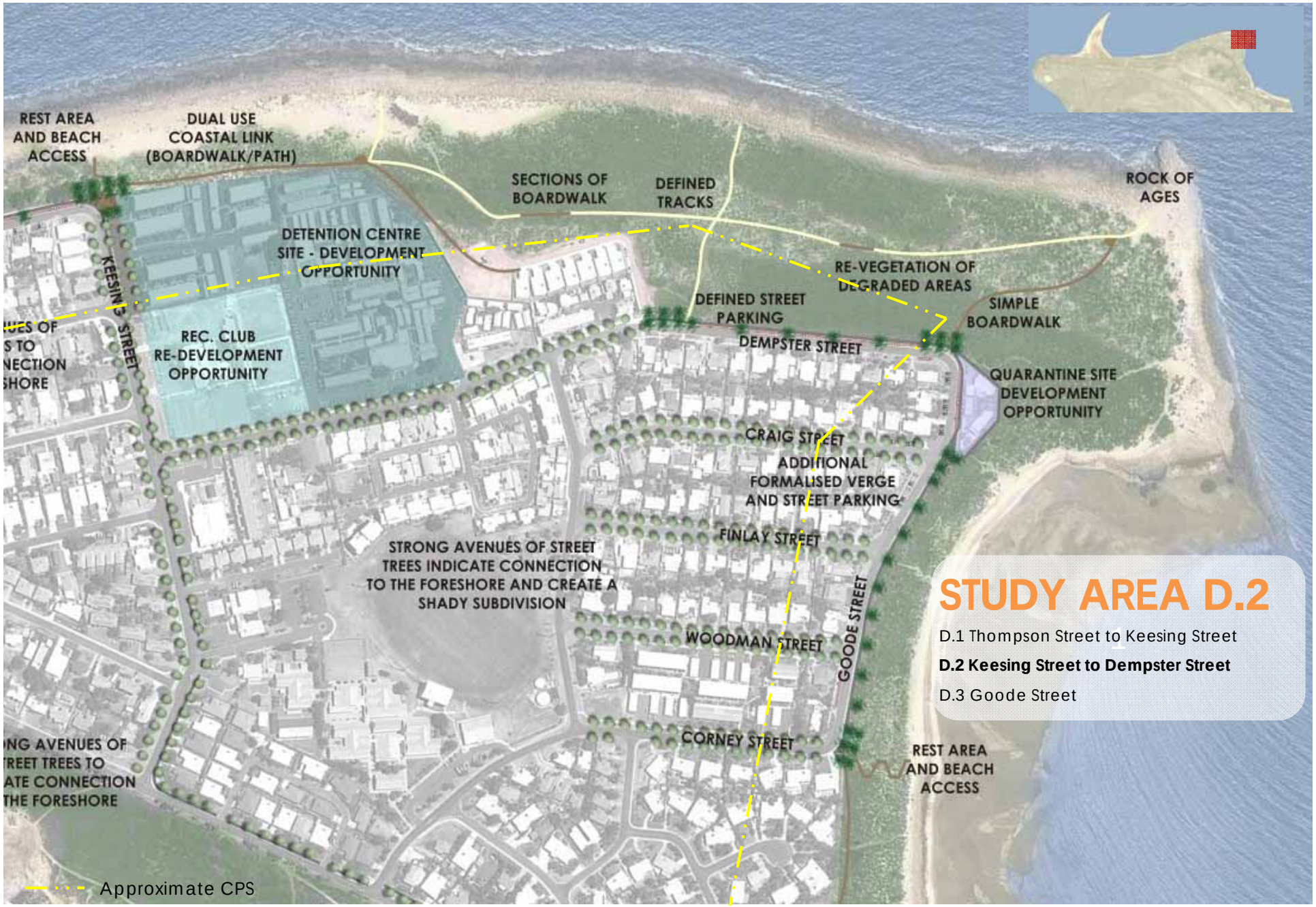
Beach Access

Defined beach access will assist with dune revegetation efforts and improve connection to coastal environments.

These beach access points are proposed for the end of adjoining streets and their presence highlighted with groups of tall feature trees. The entrances to these access points could be seated rest areas/lookouts shaded by the feature trees, to allow those travelling the foreshore route pleasant respite.

Beach access materials must be termite resistant and robust to withstand coastal processes.

Example of non-timber beach access


REST AREA AND BEACH ACCESS
DUAL USE COASTAL LINK (BOARDWALK/PATH)
SECTIONS OF BOARDWALK
DEFINED TRACKS
ROCK OF AGES
DETENTION CENTRE SITE - DEVELOPMENT OPPORTUNITY
KEESING STREET
RE-VEGETATION OF DEGRADED AREAS
DEFINED STREET PARKING
SIMPLE BOARDWALK
DEMPSTER STREET
REC. CLUB RE-DEVELOPMENT OPPORTUNITY
QUARANTINE SITE DEVELOPMENT OPPORTUNITY
CRAIG STREET
ADDITIONAL FORMALISED VERGE AND STREET PARKING
FINLAY STREET
STRONG AVENUES OF STREET TREES INDICATE CONNECTION TO THE FORESHORE AND CREATE A SHADY SUBDIVISION
GOODE STREET
WOODMAN STREET
CORNEY STREET
REST AREA AND BEACH ACCESS
Approximate CPS
STUDY AREA D.2
D.1 Thompson Street to Keesing Street
D.2 Keesing Street to Dempster Street
D.3 Goode Street

Example of non-timber boardwalk, Lake Thetis

Defined Pedestrian Access

Subtle, low key, but well defined dune tracks with portions of boardwalk will assist with dune revegetation by controlling pedestrian movements.

These proposed tracks and boardwalks will improve access to Port Hedland's unique coastal environment. The "Rock of Ages" area at the end of Cooke Point is a place of high interest and a popular fishing spot. Utilisation of this area would be improved with improved access and potential shaded rest area.

Beach access materials must be termite resistant and robust to withstand coastal processes.

Example of low profile dune boardwalk

Clancy's Fish Pub, City Beach

Streetscape Upgrade (Quarantine Site Development)

The Quarantine Building is a prime site with views overlooking the Rock of Ages and across Goode Street Beach to Pretty Pool. An opportunity exists to convert the site into a hospitality venue.

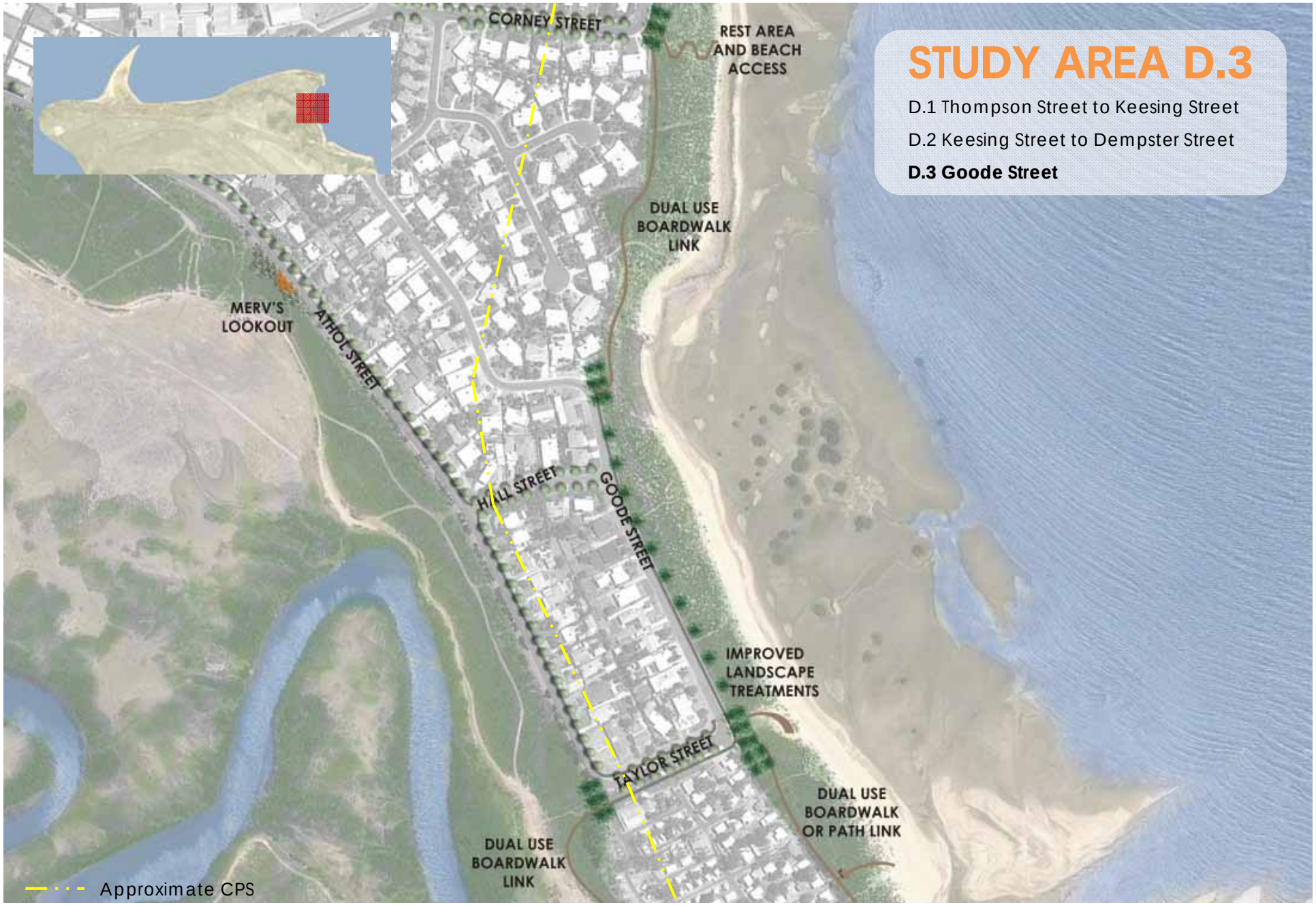
Clancy's Fish Pub in City Beach provides a similar example of what potentially could exist on the site.

The surrounding wide verges have ample room for defined angle parking and street tree treatments to accommodate this amenity.

Beach front streetscape, Cottesloe

Defining street tree avenue

MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
Cooke Point and Rock of Ages Area	Seaward of CPS	Planned or Managed Retreat	o Requirement for disclosure of hazards/vulnerability, eg. notification on title; o Prevention of further development within the coastal dune areas E.g. only proposing low value paths and recreation amenity with the demolition and removal of infrastructure as they become at risk by coastal hazards; o Prohibiting high value developments and infrastructure in at risk areas in favour of low cost activities (such as recreation, etc); o Leaving land and resources unprotected; o Locating major roads and key community infrastructure away from the immediate coast; and, o Retaining public coastal land in public ownership.


CORNEY STREET
REST AREA AND BEACH ACCESS
STUDY AREA D.3
D.1 Thompson Street to Keesing Street
D.2 Keesing Street to Dempster Street
D.3 Goode Street
DUAL USE BOARDWALK LINK
MERV'S LOOKOUT
ATHOL STREET
HALL STREET
GOODE STREET
IMPROVED LANDSCAPE TREATMENTS
TAYLOR STREET
DUAL USE BOARDWALK OR PATH LINK
DUAL USE BOARDWALK LINK
Approximate CPS

An example of a dual use Boardwalk with coastal views

An example of a dual use Boardwalk

Foreshore connection boardwalk

Another current area of disconnect along the foreshore exists along Goode Street between its intersections with Corney Street and McPherson Street.

A dual use boardwalk through the dunes would help create a continuous foreshore route for pedestrians and cyclists.

This boardwalk would also assist in connecting the Pretty Pool area and the rest of the town.

MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
Goode Street to the caravan Park	Seaward of CPS	Accommodate	o Preparation of emergency evacuation plans to reduce the human consequences of coastal hazards; o Raised boardwalk infrastructure in areas prone to inundation and flooding and construct lower portions of structures of flood resistant materials and are designed to withstand water forces; e.g. Pretty Pool Bridge connection and board walks; o Locating development on the least hazardous portion of the site E.g. Goode Street Boardwalks to the back of the dune adjacent streets; o Recommend reducing the footprint of the proposed Caravan Park and shifting the footprint away from the hazard and allow for future relocation; o Altering the site to reduce its risk to coastal hazards E.g. Continue Goode Street stabilization works; o Permit development of temporary or low value assets such as paths, board walks and recreational amenity; o Do not permit development of high value assets (community centers, schools, hospitals); and, o The Landscape amenity will be designed to be durable and effective for the estimated time period and/or have reasonably well known maintenance and operating costs for the design period;

FORESHORE STUDY AREAS

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Medium term implementation (3 - 10 years)

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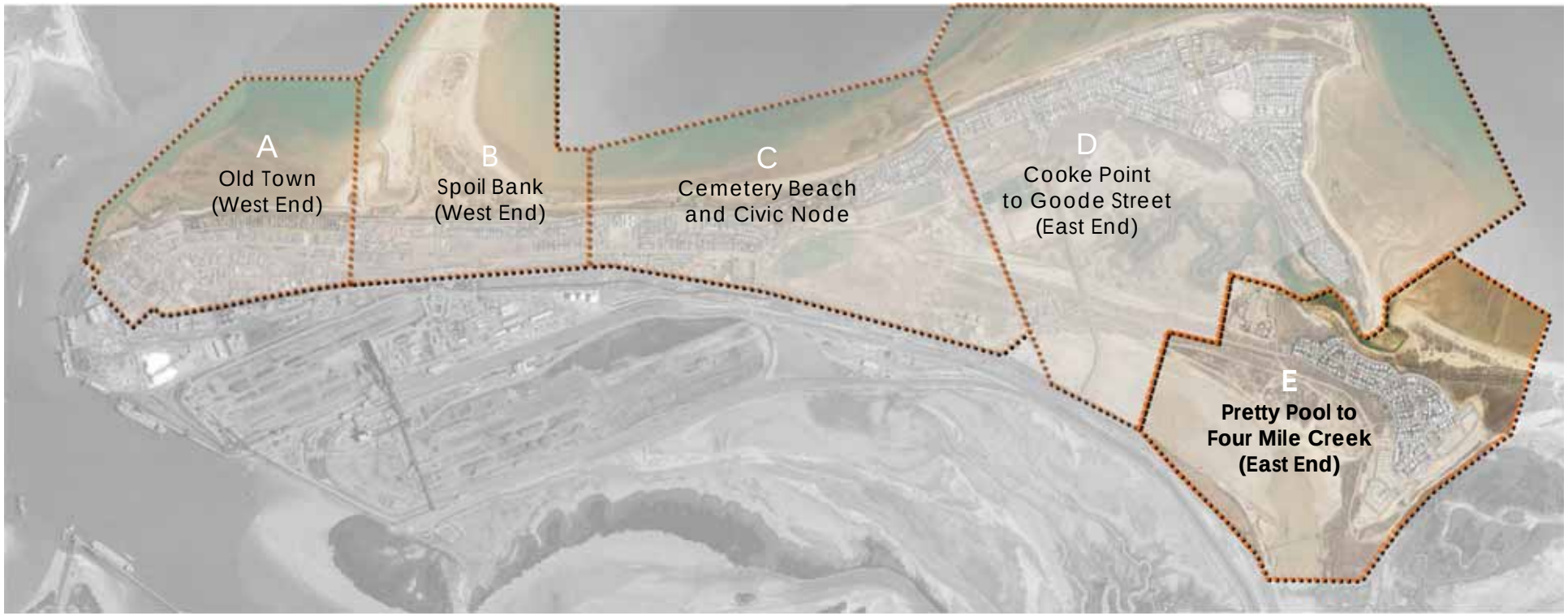
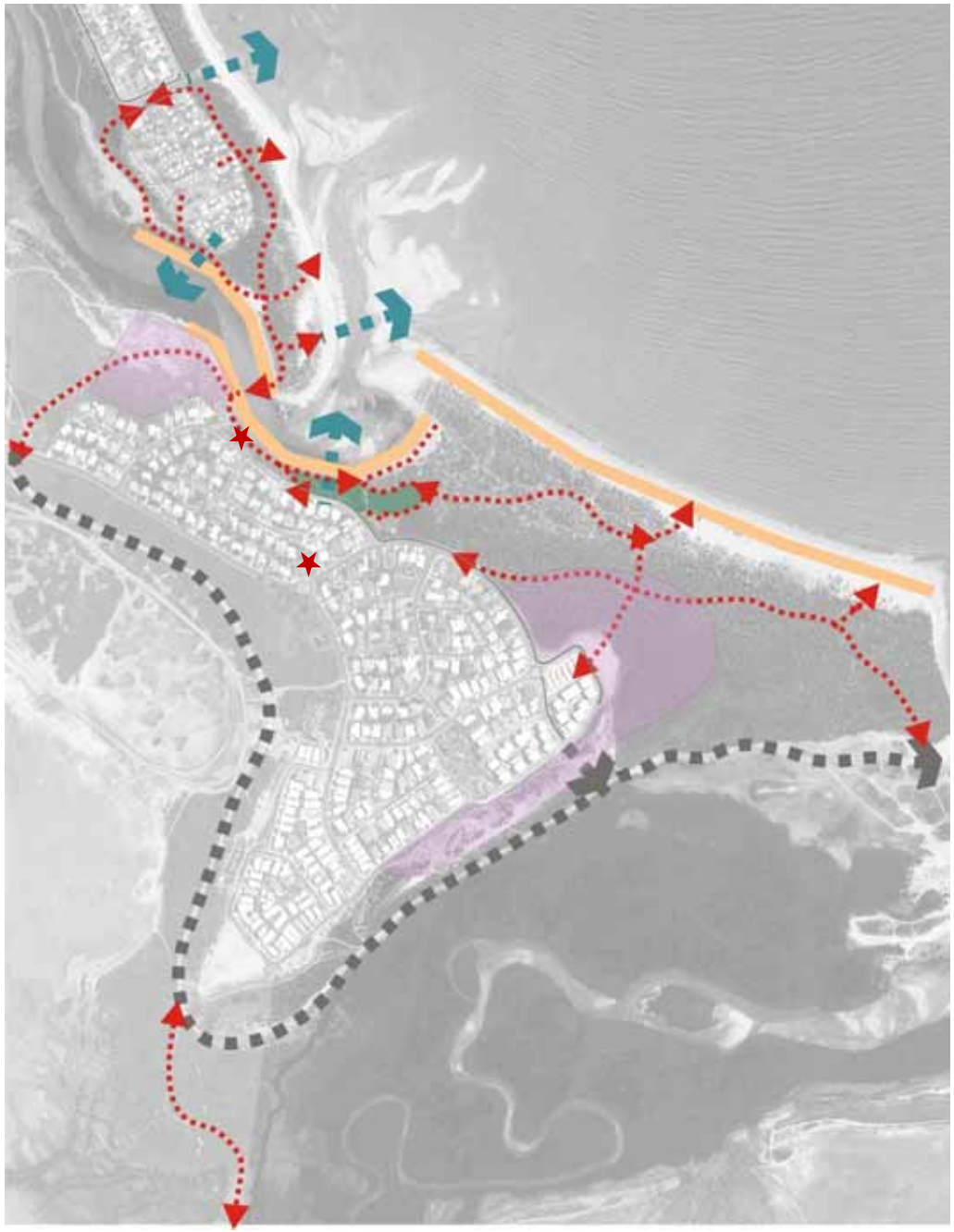




STUDY AREA E

Opportunities and Directions

- Retain views to the ocean
- Strong streetscape character and way finding cues E.g. Trees & art
- Continuous pedestrian connectivity
- Residential Focus
- Formalise street parking

Art / Interpretation

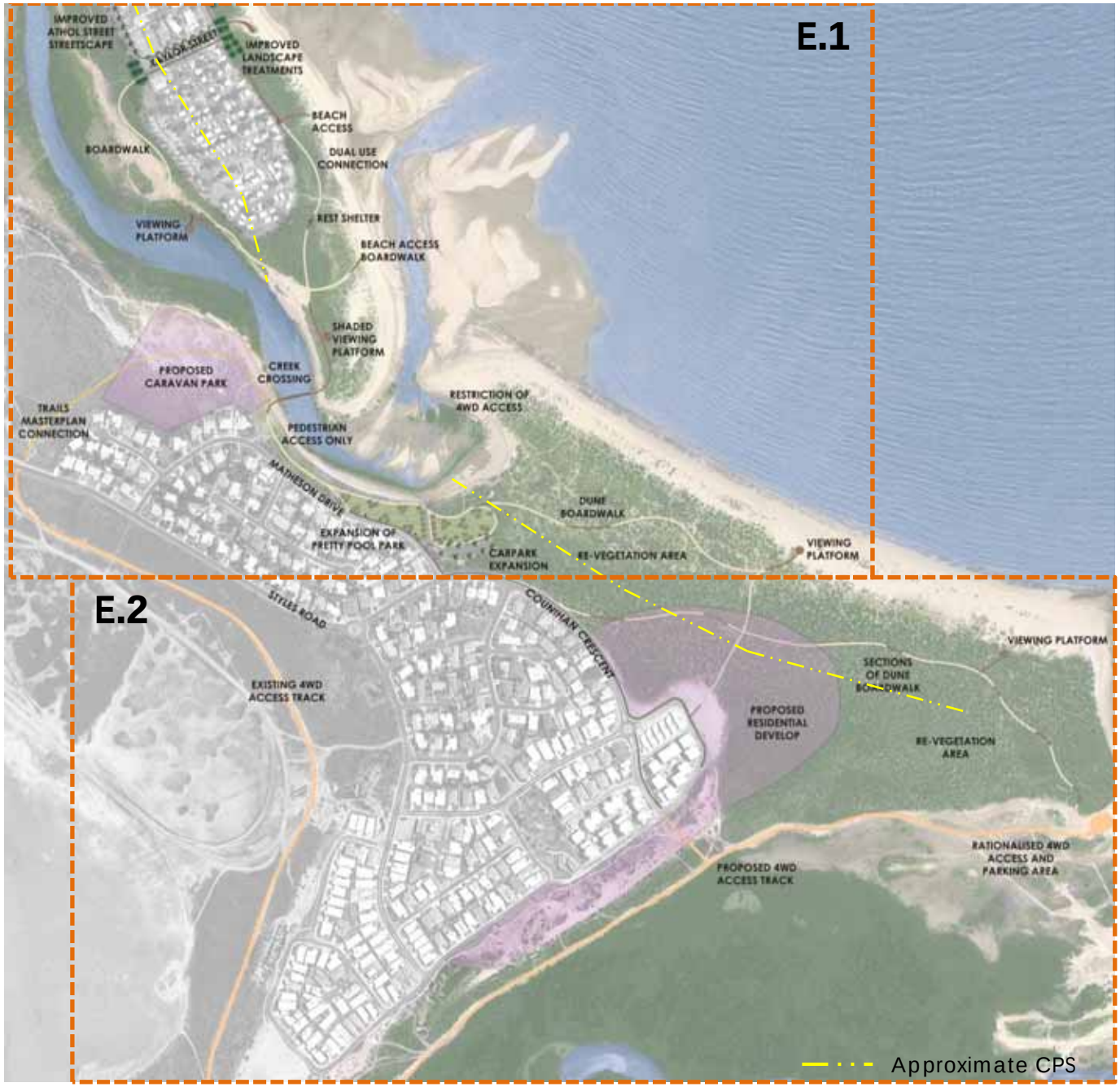
Views / Foreshore Connections

Pedestrian Connections

POS Area

Conservation Area

Formalised Off-Road Vehicle route



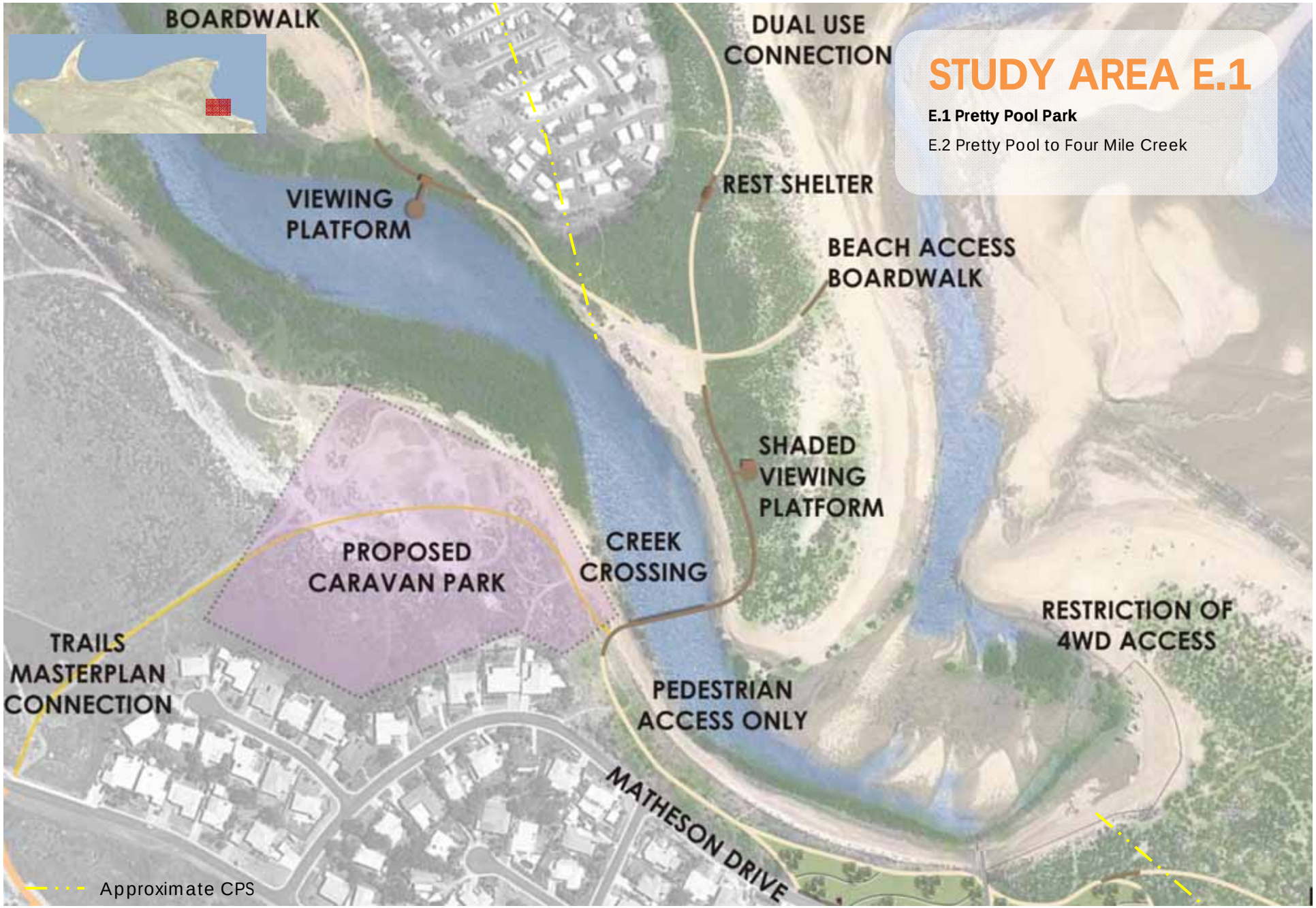
STUDY AREA E

Overall Masterplan

Study Area E Pretty Pool to Four Mile Creek (East End)

E.1 Pretty Pool Park

E.1 Pretty Pool to Four Mile Creek


BOARDWALK
DUAL USE CONNECTION
STUDY AREA E.1
E.1 Pretty Pool Park
E.2 Pretty Pool to Four Mile Creek
VIEWING PLATFORM
REST SHELTER
BEACH ACCESS BOARDWALK
SHADED VIEWING PLATFORM
PROPOSED CARAVAN PARK
CREEK CROSSING
RESTRICTION OF 4WD ACCESS
TRAILS MASTERPLAN CONNECTION
PEDESTRIAN ACCESS ONLY
MATHESON DRIVE
Approximate CPS

Pretty Pool

Example of a waterway viewing platform

Water Viewing Platform

Pretty Pool Creek is an area of high cultural value and community significance and requires protection from vehicle degradation. A series of boardwalks and defined paths are proposed to create defined access that allows interaction with this unique environment.

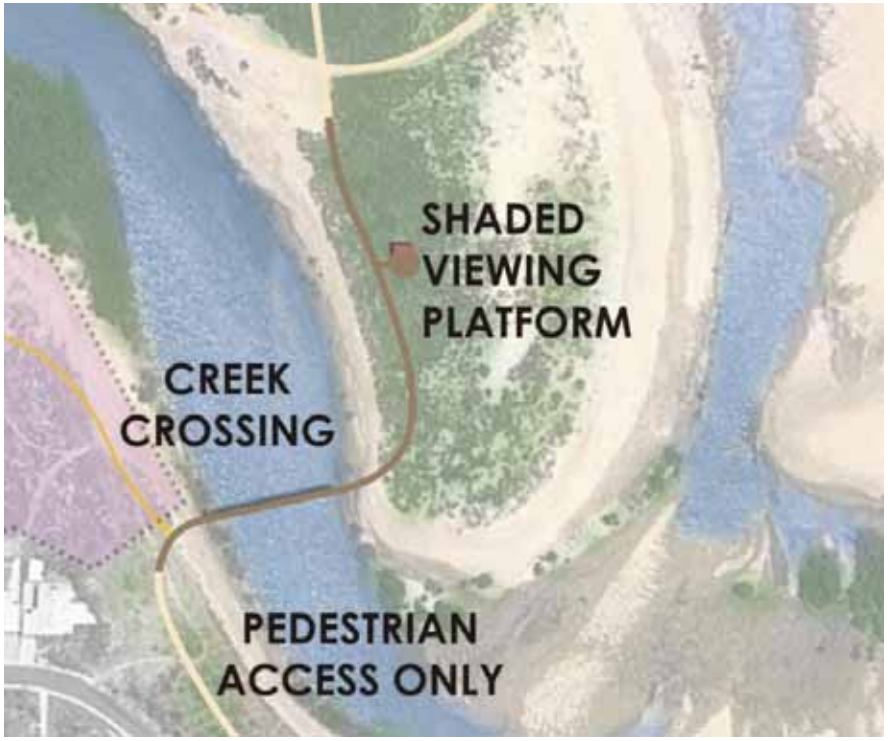
To promote the unique Pretty Pool Creek environment and provide opportunity for pedestrians to connect with the water, a water level viewing platform is proposed amongst the mangroves near the Pretty Pool Caravan Park.

Mangrove boardwalk, Currumbin Queensland

Example of a waterway crossing, Wilsons Promontory, Victoria

Creek Crossing

A dual use link from Goode Street to Pretty Pool and beyond via a subtle bridge connection is proposed over Pretty Pool Creek. It is important that the bridge is elevated to enable passing of canoes and small recreational water craft.



View from pretty Pool Park western edge

Riverside Park, Port of Brisbane

Pretty Pool Park Expansion and Upgrade

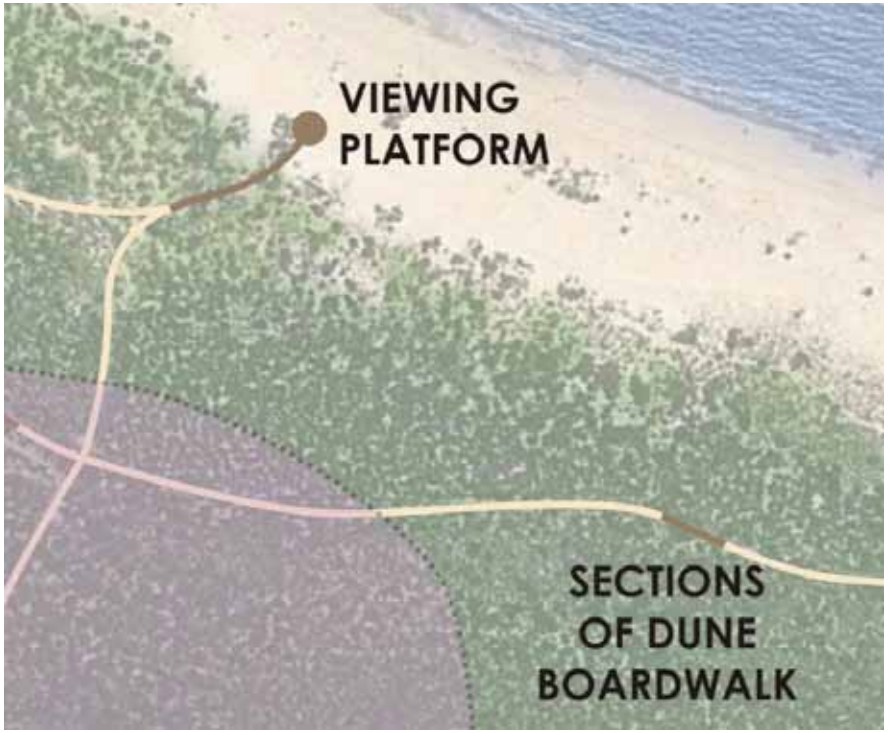
Due to the popularity of the Pretty Pool Park it is proposed that the park be extended to the west to provide more shaded, picnic and lawn space. This western extension would take advantage of the sites elevated position and great views to great an easily accessible area of high amenity.

The car park would also be extended to the east to accommodate the increased use of this already popular area.

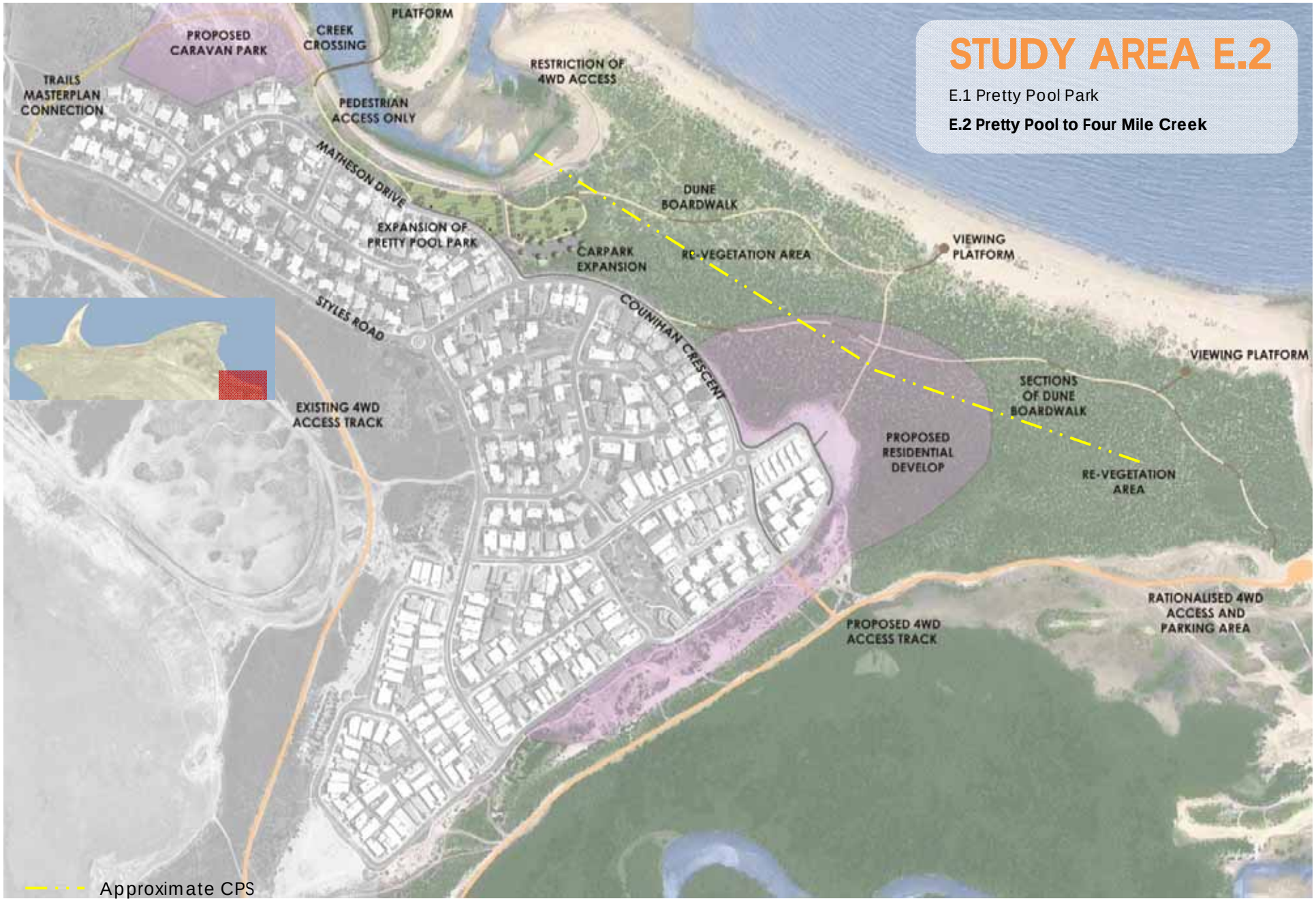
Dune Boardwalk

There is an opportunity to provide pedestrian only recreation tracks and boardwalks into the east Pretty Pool dunes area. This would assist in limiting damage to this ecologically important area.

The defined routes could include interpretation about the turtle and migratory shorebird communities.



MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
Pretty Pool Park	Landward of CPS	Accommodate	o This is area Landward of the CPS therefore outside of the buffer zone. o This is a development with an expected lifespan of less than 30 years for public recreation purposes on the proviso that the development is to be removed or modified should it be threatened by erosion or creates an erosion threat to other land. The development includes car parks for coastal recreational users, recreational amenities such as public ablutions, barbeque/picnic/shade areas, playground and other recreational equipment, infrastructure for public safety, and pedestrian access structures such as ramps, stairs and paths.


STUDY AREA E.2
E.1 Pretty Pool Park
E.2 Pretty Pool to Four Mile Creek
PROPOSED CARAVAN PARK
CREEK CROSSING
PLATFORM
RESTRICTION OF 4WD ACCESS
TRAILS MASTERPLAN CONNECTION
PEDESTRIAN ACCESS ONLY
MATHESON DRIVE
DUNE BOARDWALK
EXPANSION OF PRETTY POOL PARK
CARPARK EXPANSION
RE-VEGETATION AREA
VIEWING PLATFORM
STYLES ROAD
COUNIHAN CRESCENT
VIEWING PLATFORM
SECTIONS OF DUNE BOARDWALK
EXISTING 4WD ACCESS TRACK
PROPOSED RESIDENTIAL DEVELOP
RE-VEGETATION AREA
RATIONALISED 4WD ACCESS AND PARKING AREA
PROPOSED 4WD ACCESS TRACK
Approximate CPS

4wd restricting bollards

Off-Road Vehicle Access Restriction

The ecological preservation of the east Pretty Pool Dune area requires continued restriction of off-road vehicles. Off-road vehicle activity has an adverse impact upon migratory shorebird and Flat Back Turtle communities that rely upon this sensitive area.

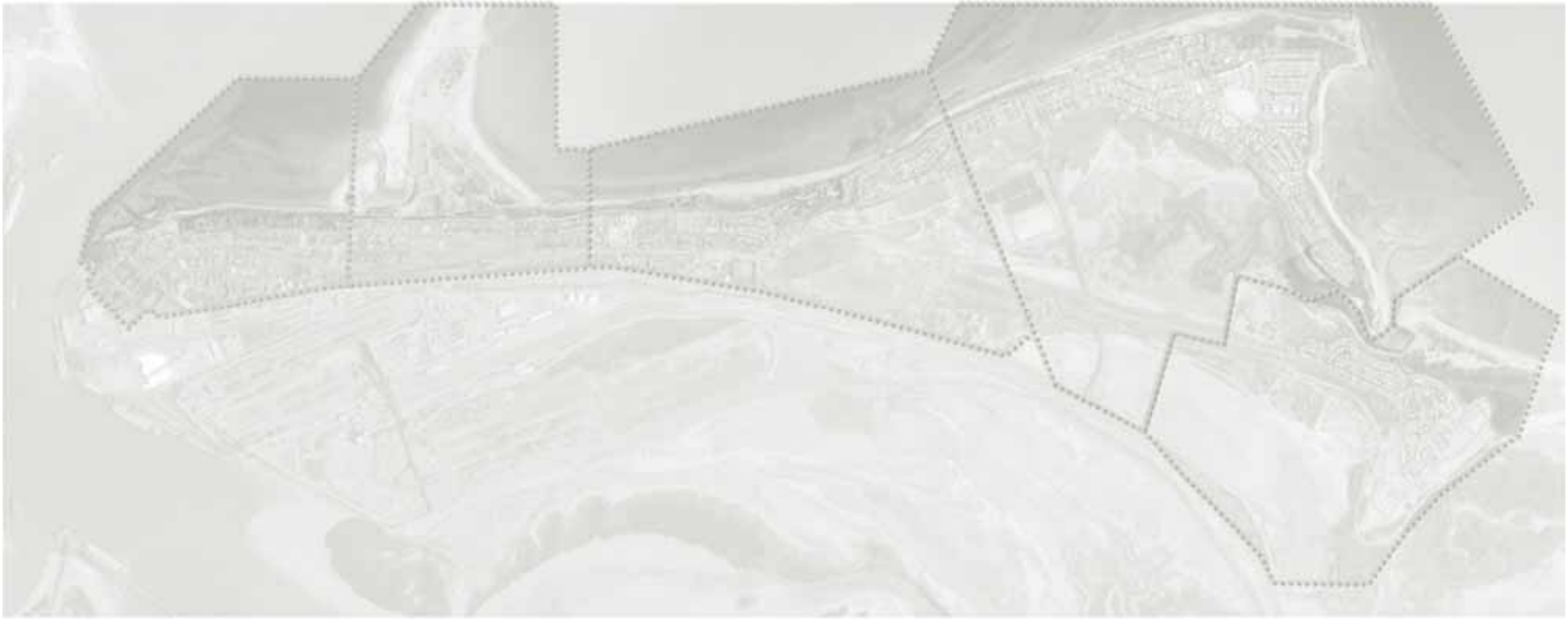
Informative signage and formalised off–road vehicle tracks and parking areas are proposed to create simple defined routes that allow access and connection to this area whilst minimising ecological damage.

Curlew Sandpiper

Flatback Turtle Hatchling

MASTERPLAN SITE	SITE	RISK ADAPTION	CONSIDERED ELEMENTS
Pretty Pool Residential Area	Landward of CPS	Accommodate	o This is area is Landward of the CPS therefore outside of the buffer zone. o Requirement for disclosure of hazards/vulnerability, eg. notification on title of residents; o Implement a protection scheme; o Beach nourishment or replenishment; o Dune management; o There is likely to be long-term commitment to a high level of development in the area to justify the long-term costs; and, o The area will remain ultimately defendable as is landward of the CPS.

OPINION OF PROBABLE COST



Study Area A "Old Town"

Preliminary Opinion of Probable Cost

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Study Area A "Old Town" - Preliminary Opinion Of Probable Cost

	DESCRIPTION		UNIT	LOW RATE	HIGH RATE	LOW TOTALS	HIGH TOTALS
	TOTAL LANDSCAPE WORKS AREA APPROX. 97,300m2						
1.00	**SITE PRELIMINARIES (as required)**						
1.01	Major grading of existing surface to achieve final landscape levels including mounding, new retaining to Bert Madigan Park & Boat Ramp Car Park	1	allow	$100,000.00	$200,000.00	$100,000.00	$200,000.00
1.02	Site project management, Site insurance & OHS Requirements & Mobilisation	1	allow	$100,000.00	$200,000.00	$100,000.00	$200,000.00
	Subtotal					**$200,000.00**	**$400,000.00**
2.00	**HARD LANDSCAPE AND FURNITURE**						
2.01	Supply and install cantilvered/urban boardwalks	300	lm	$1,000.00	$3,000.00	$300,000.00	$900,000.00
2.02	Supply and install simple boardwalks to access the beach	160	lm	$500.00	$700.00	$80,000.00	$112,000.00
2.03	Supply and install decking to rest areas along boardwalk (e.g. Millboard)	165	m2	$150.00	$300.00	$24,750.00	$49,500.00
2.04	Supply and install retaining walls to lawn terraces at existing Boat Ramp Car Park	615	lm	$300.00	$600.00	$184,500.00	$369,000.00
2.05	Supply and install concrete beach access steps at existing Boat Ramp Car Park	280	lm	$110.00	$200.00	$30,800.00	$56,000.00
2.06	Supply and install lookout tower	1	each	$500,000.00	$1,000,000.00	$500,000.00	$1,000,000.00
2.07	Supply and install feature paving	5,530	m2	$260.00	$350.00	$1,437,800.00	$1,935,500.00
2.08	Supply and install footpath paving to Richardson St & Esplanade	1,800	lm	$200.00	$300.00	$360,000.00	$540,000.00
2.09	Construction of new jetty from Mpark	1	allow	$1,000,000.00	$1,500,000.00	$1,000,000.00	$1,500,000.00
2.10	Supply and install traffic calming paving along Richardson St & Esplanade (civil works)	200	m2	$110.00	$200.00	$22,000.00	$40,000.00
2.11	Supply and install furniture (seats, picnic tables, bins)	1	allow	$150,000.00	$200,000.00	$150,000.00	$200,000.00
2.12	Supply and install custom furniture	1	allow	$50,000.00	$60,000.00	$50,000.00	$60,000.00
2.13	Supply and install tree grates	368	each	$1,000.00	$1,500.00	$368,000.00	$552,000.00
2.14	Supply and install artistic shade shelters	37	each	$20,000.00	$50,000.00	$740,000.00	$1,850,000.00
	Subtotal					**$5,247,850.00**	**$9,164,000.00**
3.00	**SOFT LANDSCAPE & PLANTING**						
3.01	Supply and spread imported topsoil to all trees and lawn (3m2/tree)	18,150	m2	$15.00	$20.00	$272,250.00	$363,000.00
3.02	Supply and plant lawn	17,050	m2	$15.00	$20.00	$255,750.00	$341,000.00
3.03	Supply and plant advanced 100Lt Street Trees	275	each	$500.00	$600.00	$137,500.00	$165,000.00
3.04	Supply and plant advanced 100Lt Feature Trees	38	each	$500.00	$600.00	$19,000.00	$22,800.00
3.05	Supply and plant 100Lt Pos Trees along Foreshore	55	each	$500.00	$600.00	$27,500.00	$33,000.00
	Subtotal					**$712,000.00**	**$924,800.00**
4.00	**SIGNAGE STRATEGY**						
4.01	Signage Strategy exploring culture, heritage and land themes.	6	Allow	$2,000.00	$3,000.00	$12,000.00	$18,000.00
	Subtotal					**$12,000.00**	**$18,000.00**
5.00	**ART STRATEGY**						
5.01	Artwork at the end of Jetty & at Boat Ramp Car Park POS	1	Allow	$100,000.00	$250,000.00	$100,000.00	$250,000.00
	Subtotal					**$100,000.00**	**$250,000.00**

Study Area A "Old Town"

Preliminary Opinion of Probable Cost

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6.00	**ELECTRICAL**						
6.01	Electrical connections (e.g. BBQ & Lights)	1	Allow	$25,000.00	$35,000.00	$25,000.00	$35,000.00
6.02	Supply and delivery of pole top lights/solar luminaires along foreshore and jetty length, picnic areas etc (spaced @20m)	48	Lights	$9,500.00	$12,000.00	$456,000.00	$576,000.00
6.03	Solar light bollards to rest areas (deck rest areas + shade shelters areas) (spaced @2m)	115	Lights	$1,500.00	$3,500.00	$172,500.00	$402,500.00
6.04	Feature Lighting	1	allow	$100,000.00	$150,000.00	$100,000.00	$150,000.00
	Subtotal					**$753,500.00**	**$1,163,500.00**
7.00	**IRRIGATION** - Costings based on supply of new system no allowance has been made to retain or utilize existing irrigation system.						
7.01	Water connection	1	Allow	$25,000.00	$35,000.00	$25,000.00	$35,000.00
7.02	Head works	1	Allow	$35,000.00	$40,000.00	$35,000.00	$40,000.00
7.03	Supply and install ongoing pop up sprinklers to lawn area	17,050	m2	$18.00	$25.00	$306,900.00	$426,250.00
7.04	Supply and install bubblers to Street Trees	275	each	$25.00	$40.00	$6,875.00	$11,000.00
7.05	Supply and install bubblers to Feature Trees	38	each	$25.00	$40.00	$950.00	$1,520.00
7.06	Supply and install bubblers to Pos Trees	55	each	$25.00	$40.00	$1,375.00	$2,200.00
	Subtotal					**$376,100.00**	**$515,970.00**
8.00	**ESTABLISHMENT, MAINTENANCE & DEFECTS LIABILITY PERIOD**						
8.01	(24) Twenty Four Months Establishment, Maintenance & Liability Period for all irrigation, hard and soft landscape items following Practical Completion and ongoing rectification of defects	24	Months	$2,000.00	$8,000.00	$48,000.00	$192,000.00
	Subtotal					**$48,000.00**	**$192,000.00**
	TOTAL					**$7,449,450.00**	**$12,628,270.00**
9.00	**CONTINGENCY SUM 20%**					**$1,489,890.00**	**$2,525,654.00**
	TOTAL WORKS (EX GST)					**$8,939,340.00**	**$15,153,924.00**
Proposed Development							
Mp Art Space, Beacon Tower, Dome Café and the Nurse's Quarters, Port Authority Main Street Jetty Expansion Proposal							

Study Area B "Spoil Bank"

Preliminary Opinion of Probable Cost

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Study Area B "Spoil Bank" - Preliminary Opinion Of Probable Cost

	DESCRIPTION		UNIT	LOW RATE	HIGH RATE	LOW TOTALS	HIGH TOTALS
	TOTAL LANDSCAPE WORKS AREA APPROX. 250,000 m2						
1.00	SITE PRELIMINARIES (as required)						
1.01	Fine grading	1	allow	$100,000	$200,000	$100,000	$200,000
1.02	Site project management, Site insurance & OHS Requirements & Mobilisation	1	allow	$100,000	$200,000	$100,000	$200,000
	Subtotal					$200,000	$400,000
2.00	HARD LANDSCAPE AND FURNITURE						
2.01	Supply and install shade shelters on beach nodes	16	each	$20,000	$30,000	$320,000	$480,000
2.02	Supply and install furniture to beach nodes (picnic table, BBQ, Bins)	8	allow	$30,000	$40,000	$240,000	$320,000
2.03	Fencing to sand tracks	2,500	lm	$90	$120	$225,000	$300,000
	Subtotal					$785,000	$1,100,000
3.00	SOFT LANDSCAPE & PLANTING						
3.01	Supply and spread imported topsoil to all trees (3m2/tree)	117	m2	$15	$20	$1,755	$2,340
3.02	Supply and plant advanced 100Lt Street Trees	26	each	$500	$600	$13,000	$15,600
3.03	Supply and plant advanced 100Lt Feature Trees	13	m2	$500	$600	$6,500	$7,800
3.04	Dune revegetation - Direct seeding	175,000	m2	$2	$3	$350,000	$525,000
3.05	Upgrading of existing areas e.g. landscape treatments on Sutherland Street	1,500	m2	$15	$20	$22,500	$30,000
	Subtotal					$393,755	$580,740
4.00	SIGNAGE STRATEGY						
4.01	Signage Strategy exploring culture, heritage and land themes.	3	Allow	$2,000	$3,000	$6,000	$9,000
	Subtotal					$6,000	$9,000
5.00	ART STRATEGY						
5.01	Stand alone iconic piece @ tip of Spoil Bank	1	Allow	$50,000	$70,000	$50,000	$70,000
	Subtotal					$50,000	$70,000

Study Area B "Spoil Bank"

Preliminary Opinion of Probable Cost

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6.00	**ELECTRICAL**						
6.01	Electrical connection (e.g BBQ & Lighting)	1	Allow	$25,000	$35,000	$25,000	$35,000
6.02	Supply and install pole top lights/solar luminaires along roads and in rest areas	35	each	$9,500	$12,000	$332,500	$420,000
	Subtotal					**$357,500**	**$455,000**
7.00	**IRRIGATION** - Costings based on supply of new system no allowance has been made to retain or utilize existing irrigation system.						
7.01	Water connection	1	Allow	$25,000	$35,000	$25,000	$35,000
7.02	Head works	1	Allow	$35,000	$40,000	$35,000	$40,000
7.03	Supply and install bubblers to street trees	26	each	$25	$40	$650	$1,040
7.04	Supply and install bubblers to feature trees	13	each	$25	$40	$325	$520
	Subtotal					**$60,975**	**$76,560**
8.00	**ESTABLISHMENT, MAINTENANCE & DEFECTS LIABILITY PERIOD**						
8.01	(24) Twenty Four Months Establishment, Maintenance & Liability Period for all irrigation, hard and soft landscape items following Practical Completion and ongoing rectification of defects	24	Months	$1,500	$2,000	$36,000	$48,000
	Subtotal					**$36,000**	**$48,000**
	TOTAL					**$2,246,730**	**$2,284,300**
9.00	**CONTINGENCY SUM 20%**					**$449,346**	**$456,860**
	TOTAL WORKS (EX GST)					**$2,696,076**	**$2,741,160**

Proposed Development

Marina Development Spoil Bank

Study Area C "Cemetery Beach and Civic Node"

Preliminary Opinion of Probable Cost

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Study Area C "Cemetery Beach & Civic Node" - Preliminary Opinion Of Probable Cost

	DESCRIPTION		UNIT	LOW RATE	HIGH RATE	LOW TOTALS	HIGH TOTALS
	TOTAL LANDSCAPE WORKS AREA APPROX. 143,600m2						
1.00	SITE PRELIMINARIES (as required)						
1.01	Fine grading	1	allow	$100,000.00	$200,000.00	$100,000.00	$200,000.00
1.02	Site project management, Site insurance & OHS Requirements & Mobilisation	1	allow	$100,000.00	$200,000.00	$100,000.00	$200,000.00
	Subtotal					$200,000.00	$400,000.00
2.00	HARD LANDSCAPE AND FURNITURE						
2.01	Supply and install simple boardwalks to access beach	165	lm	$500.00	$700.00	$82,500.00	$115,500.00
2.02	Supply and install shade shelters	32	each	$20,000.00	$30,000.00	$640,000.00	$960,000.00
2.03	Additional asphalt to parking areas along roads (civil works)	1	allow	$800,000.00	$1,000,000.00	$800,000.00	$1,000,000.00
2.04	Supply and install traffic calming paving (civil works)	290	m2	$110.00	$200.00	$31,900.00	$58,000.00
2.05	Supply and install concrete lookout areas along Southerland St (each 18m2)	160	m2	$110.00	$200.00	$17,600.00	$32,000.00
2.06	Fencing to sand tracks connecting to Spoil Bank	1,200	lm	$90.00	$120.00	$108,000.00	$144,000.00
2.07	Supply and install concrete pads to picnic areas adjacent Hotel/Civic Node	320	m2	$110.00	$200.00	$35,200.00	$64,000.00
2.08	Supply and install retaining walls to lawn terraces	400	lm	$300.00	$600.00	$120,000.00	$240,000.00
2.09	Supply and install furniture (seats, picnic tables, bins, bbq)	1	allow	$150,000.00	$200,000.00	$150,000.00	$200,000.00
	Subtotal					$1,985,200.00	$2,813,500.00
3.00	SOFT LANDSCAPE & PLANTING						
3.01	Supply and spread imported topsoil to all trees, lawn and garden beds (3m2/tree)	10,000	m2	$15.00	$20.00	$150,000.00	$200,000.00
3.02	Supply and plant advanced 100Lt Street Trees	396	each	$500.00	$600.00	$198,000.00	$237,600.00
3.03	Supply and plant advanced 100Lt Feature Trees	57	m2	$500.00	$600.00	$28,500.00	$34,200.00
3.04	Supply and plant 100Lt Pos Trees	133	m2	$500.00	$600.00	$66,500.00	$79,800.00
3.05	Supply and plant lawn	27,410	m2	$15.00	$20.00	$411,150.00	$548,200.00
3.06	Garden beds - high quality soft landscape	2,000	m2	$50.00	$70.00	$100,000.00	$140,000.00
	Subtotal					$954,150.00	$1,239,800.00
5.00	SIGNAGE STRATEGY						
5.01	Signage Strategy exploring culture, heritage and land themes.	5	Allow	$2,000.00	$3,000.00	$10,000.00	$15,000.00
	Subtotal					$10,000.00	$15,000.00
6.00	ART STRATEGY						
6.01	Koombana Lookout Interpretive Element	1	Allow	$100,000.00	$150,000.00	$100,000.00	$150,000.00
	Subtotal					$100,000.00	$150,000.00

Study Area C "Cemetery Beach and Civic Node"

Preliminary Opinion of Probable Cost

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7.00	**ELECTRICAL**						
7.01	Electrical connections (e.g. BBQ & irrigation)	1	Allow	$25,000.00	$35,000.00	$25,000.00	$35,000.00
7.02	Supply and delivery of pole top lights/solar luminaires along concrete paths (spaced @20m)	34	Lights	$9,500.00	$12,000.00	$323,000.00	$408,000.00
7.03	Solar light bollards to rest areas (deck rest areas + shade sghelter areas along boardwalk) (spaced @2m)	100	Lights	$1,500.00	$3,500.00	$150,000.00	$350,000.00
7.04	Feature Lighting	1	allow	$100,000.00	$150,000.00	$100,000.00	$150,000.00
	Subtotal					**$598,000.00**	**$943,000.00**
8.00	**IRRIGATION** - Costings based on supply of new system no allowance has been made to retain or utilize existing irrigation system.						
8.01	Water connection	1	Allow	$25,000.00	$35,000.00	$25,000.00	$35,000.00
8.02	Head works	1	Allow	$35,000.00	$40,000.00	$35,000.00	$40,000.00
8.03	Supply and install bubblers to street trees	396	each	$25.00	$40.00	$9,900.00	$15,840.00
8.04	Supply and install bubblers to feature trees	57	each	$25.00	$40.00	$1,425.00	$2,280.00
8.05	Supply and install bubblers to Pos trees	133	each	$25.00	$40.00	$3,325.00	$5,320.00
8.06	Supply and install sprinklers to lawn areas	27,410	m2	$18.00	$25.00	$493,380.00	$685,250.00
8.07	Supply and install drip irrigation to garden beds	2,000	m2	$5.00	$15.00	$10,000.00	$30,000.00
	Subtotal					**$578,030.00**	**$813,690.00**
9.00	**ESTABLISHMENT, MAINTENANCE & DEFECTS LIABILITY PERIOD**						
9.01	(24) Twenty Four Months Establishment, Maintenance & Liability Period for all irrigation, hard and soft landscape items following Practical Completion and ongoing rectification of defects	24	Months	$2,000.00	$8,000.00	$48,000.00	$192,000.00
	Subtotal					**$48,000.00**	**$192,000.00**
	TOTAL					**$4,473,380.00**	**$6,566,990.00**
10.00	**CONTINGENCY SUM 20%**					**$894,676.00**	**$1,313,398.00**
	TOTAL WORKS (EX GST)					**$5,368,056.00**	**$7,880,388.00**

Proposed Development

Hotel Site Redevelopment, Civic Centre Upgrades, OPH Cemetery Upgrade, Water Corp Additional Tower

Study Area D "Cooke Point to Goode Street"

Preliminary Opinion of Probable Cost

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Study Area D "Cooke Point to Goode Street" - Preliminary Opinion Of Probable Cost

	DESCRIPTION		UNIT	LOW RATE	HIGH RATE	LOW TOTALS	LOW TOTALS
	TOTAL LANDSCAPE WORKS AREA APPROX. 230,000m2						
1.00	SITE PRELIMINARIES (as required)						
1.01	Fine grading	1	allow	$100,000.00	$200,000.00	$100,000.00	$200,000.00
1.02	Site project management, Site insurance & OHS Requirements & Mobilisation	1	allow	$100,000.00	$200,000.00	$100,000.00	$200,000.00
	Subtotal					$200,000.00	$400,000.00
2.00	HARD LANDSCAPE AND FURNITURE						
2.01	Supply and install simple low boardwalks	300	lm	$500.00	$1,000.00	$150,000.00	$300,000.00
2.02	Supply and install decking to rest areas along boardwalks	100	m2	$150.00	$300.00	$15,000.00	$30,000.00
2.03	Supply and install cantilevered boardwalks to access the beach	320	lm	$500.00	$700.00	$160,000.00	$224,000.00
2.04	Supply and install shade shelters along boardwalks	4	each	$20,000.00	$50,000.00	$80,000.00	$200,000.00
2.05	Additional asphalt to parking areas along roads (civil works)	1	allow	$1,000,000.00	$1,500,000.00	$1,000,000.00	$1,500,000.00
2.06	Supply and install concrete lookout areas along Sutherland St (each 18m2)	90	m2	$110.00	$200.00	$9,900.00	$18,000.00
4.02	Supply and install furniture (seats, picnic tables, bins)	1	allow	$30,000.00	$50,000.00	$30,000.00	$50,000.00
	Subtotal					$1,444,900.00	$2,322,000.00
3.00	SOFT LANDSCAPE & PLANTING						
3.01	Supply and spread imported topsoil to all trees (3m2/tree)	2,100	m2	$15.00	$20.00	$31,500.00	$42,000.00
3.02	Supply and plant advanced 100Lt Street Trees	490	each	$500.00	$600.00	$245,000.00	$294,000.00
3.03	Supply and plant advanced 100Lt Feature Trees	185	m2	$500.00	$600.00	$92,500.00	$111,000.00
3.04	Supply and plant 25Lt Pos Trees	15	m2	$400.00	$500.00	$6,000.00	$7,500.00
3.05	Dune revegetation - Direct seeding near The Rock of Ages	21,000	m2	$2.00	$3.00	$42,000.00	$63,000.00
3.06	Upgrading of existing areas e.g. landscape treatments to Sutherland and King St and Merv's lookout	580	m2	$15.00	$20.00	$8,700.00	$11,600.00
	Subtotal					$425,700.00	$529,100.00
4.00	BUILDINGS						
4.01	Road realignment between Thompson St and Cooke Point Drive (civil works)	350	m	$900.00	$1,200.00	$315,000.00	$420,000.00
4.02	Ocean Pool	1	allow	$3,000,000.00	$5,000,000.00	$3,000,000.00	$5,000,000.00
4.03	Pool associated Café/Restaurant Facilities	1	allow	$500,000.00	$1,500,000.00	$500,000.00	$1,500,000.00
	Subtotal					$3,815,000.00	$6,920,000.00

Study Area D "Cooke Point to Goode Street"

Preliminary Opinion of Probable Cost

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4.00	**BUILDINGS**						
4.01	Road realignment between Thompson St and Cooke Point Drive (civil works)	350	m	$900.00	$1,200.00	$315,000.00	$420,000.00
4.02	Ocean Pool	1	allow	$3,000,000.00	$5,000,000.00	$3,000,000.00	$5,000,000.00
4.03	Pool associated Café/Restaurant Facilities	1	allow	$500,000.00	$1,500,000.00	$500,000.00	$1,500,000.00
	Subtotal					**$3,815,000.00**	**$6,920,000.00**
5.00	**SIGNAGE STRATEGY**						
5.01	Signage Strategy exploring culture, heritage and land themes.	5	Allow	$2,000.00	$3,000.00	$10,000.00	$15,000.00
	Subtotal					**$10,000.00**	**$15,000.00**
6.00	**ART STRATEGY**						
6.01	Art Strategy/Way find/interpretation	1	Allow	$20,000.00	$50,000.00	$20,000.00	$50,000.00
	Subtotal					**$20,000.00**	**$50,000.00**
7.00	**IRRIGATION** - Costings based on supply of new system no allowance has been made to retain or utilize existing irrigation system.						
7.01	Water & electrical connection	1	Allow	$25,000.00	$35,000.00	$25,000.00	$35,000.00
7.02	Head works	1	Allow	$35,000.00	$40,000.00	$35,000.00	$40,000.00
7.03	Supply and install bubblers to street trees	490	each	$25.00	$40.00	$12,250.00	$19,600.00
7.04	Supply and install bubblers to feature trees	185	each	$25.00	$40.00	$4,625.00	$7,400.00
7.05	Supply and install bubblers to Pos trees	15	each	$25.00	$40.00	$375.00	$600.00
	Subtotal					**$77,250.00**	**$102,600.00**
8.00	**ESTABLISHMENT, MAINTENANCE & DEFECTS LIABILITY PERIOD**						
8.01	(24) Twenty Four Months Establishment, Maintenance & Liability Period for all irrigation, hard and soft landscape items following Practical Completion and ongoing rectification of defects	24	Months	$2,000.00	$5,000.00	$48,000.00	$120,000.00
	Subtotal					**$48,000.00**	**$120,000.00**
	TOTAL					**$6,040,850.00**	**$10,458,700.00**
9.00	**CONTINGENCY SUM 20%**					**$1,208,170.00**	**$2,091,740.00**
	TOTAL WORKS (EX GST)					**$7,249,020.00**	**$12,550,440.00**

Proposed Development

Sewerage Plant Relocation and Residential, Athol Street Residential, Rec Club, Goode Street Rehab

Study Area E "Pretty Pool"

Preliminary Opinion of Probable Cost

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Study Area C "Cemetery Beach & Civic Node" - Preliminary Opinion Of Probable Cost

	DESCRIPTION		UNIT	LOW RATE	HIGH RATE	LOW TOTALS	HIGH TOTALS
	TOTAL LANDSCAPE WORKS AREA APPROX. 143,600m2						
1.00	SITE PRELIMINARIES (as required)						
1.01	Fine grading	1	allow	$100,000.00	$200,000.00	$100,000.00	$200,000.00
1.02	Site project management, Site insurance & OHS Requirements & Mobilisation	1	allow	$100,000.00	$200,000.00	$100,000.00	$200,000.00
	Subtotal					$200,000.00	$400,000.00
2.00	HARD LANDSCAPE AND FURNITURE						
2.01	Supply and install simple boardwalks to access beach	165	lm	$500.00	$700.00	$82,500.00	$115,500.00
2.02	Supply and install shade shelters	32	each	$20,000.00	$30,000.00	$640,000.00	$960,000.00
2.03	Additional asphalt to parking areas along roads (civil works)	1	allow	$800,000.00	$1,000,000.00	$800,000.00	$1,000,000.00
2.04	Supply and install traffic calming paving (civil works)	290	m2	$110.00	$200.00	$31,900.00	$58,000.00
2.05	Supply and install concrete lookout areas along Southerland St (each 18m2)	160	m2	$110.00	$200.00	$17,600.00	$32,000.00
2.06	Fencing to sand tracks connecting to Spoil Bank	1,200	lm	$90.00	$120.00	$108,000.00	$144,000.00
2.07	Supply and install concrete pads to picnic areas adjacent Hotel/Civic Node	320	m2	$110.00	$200.00	$35,200.00	$64,000.00
2.08	Supply and install retaining walls to lawn terraces	400	lm	$300.00	$600.00	$120,000.00	$240,000.00
2.09	Supply and install furniture (seats, picnic tables, bins, bbq)	1	allow	$150,000.00	$200,000.00	$150,000.00	$200,000.00
	Subtotal					$1,985,200.00	$2,813,500.00
3.00	SOFT LANDSCAPE & PLANTING						
3.01	Supply and spread imported topsoil to all trees, lawn and garden beds (3m2/tree)	10,000	m2	$15.00	$20.00	$150,000.00	$200,000.00
3.02	Supply and plant advanced 100Lt Street Trees	396	each	$500.00	$600.00	$198,000.00	$237,600.00
3.03	Supply and plant advanced 100Lt Feature Trees	57	m2	$500.00	$600.00	$28,500.00	$34,200.00
3.04	Supply and plant 100Lt Pos Trees	133	m2	$500.00	$600.00	$66,500.00	$79,800.00
3.05	Supply and plant lawn	27,410	m2	$15.00	$20.00	$411,150.00	$548,200.00
3.06	Garden beds - high quality soft landscape	2,000	m2	$50.00	$70.00	$100,000.00	$140,000.00
	Subtotal					$954,150.00	$1,239,800.00
5.00	SIGNAGE STRATEGY						
5.01	Signage Strategy exploring culture, heritage and land themes.	5	Allow	$2,000.00	$3,000.00	$10,000.00	$15,000.00
	Subtotal					$10,000.00	$15,000.00
6.00	ART STRATEGY						
6.01	Koombana Lookout Interpretive Element	1	Allow	$100,000.00	$150,000.00	$100,000.00	$150,000.00
	Subtotal					$100,000.00	$150,000.00

Study Area E "Pretty Pool"

Preliminary Opinion of Probable Cost

Page 2 of 2

7.00	**ELECTRICAL**						
7.01	Electrical connections (e.g. BBQ & irrigation)	1	Allow	$25,000.00	$35,000.00	$25,000.00	$35,000.00
7.02	Supply and delivery of pole top lights/solar luminaires along concrete paths (spaced @20m)	34	Lights	$9,500.00	$12,000.00	$323,000.00	$408,000.00
7.03	Solar light bollards to rest areas (deck rest areas + shade sghelter areas along boardwalk) (spaced @2m)	100	Lights	$1,500.00	$3,500.00	$150,000.00	$350,000.00
7.04	Feature Lighting	1	allow	$100,000.00	$150,000.00	$100,000.00	$150,000.00
	Subtotal					**$598,000.00**	**$943,000.00**
8.00	**IRRIGATION** - Costings based on supply of new system no allowance has been made to retain or utilize existing irrigation system.						
8.01	Water connection	1	Allow	$25,000.00	$35,000.00	$25,000.00	$35,000.00
8.02	Head works	1	Allow	$35,000.00	$40,000.00	$35,000.00	$40,000.00
8.03	Supply and install bubblers to street trees	396	each	$25.00	$40.00	$9,900.00	$15,840.00
8.04	Supply and install bubblers to feature trees	57	each	$25.00	$40.00	$1,425.00	$2,280.00
8.05	Supply and install bubblers to Pos trees	133	each	$25.00	$40.00	$3,325.00	$5,320.00
8.06	Supply and install sprinklers to lawn areas	27,410	m2	$18.00	$25.00	$493,380.00	$685,250.00
8.07	Supply and install drip irrigation to garden beds	2,000	m2	$5.00	$15.00	$10,000.00	$30,000.00
	Subtotal					**$578,030.00**	**$813,690.00**
9.00	**ESTABLISHMENT, MAINTENANCE & DEFECTS LIABILITY PERIOD**						
9.01	(24) Twenty Four Months Establishment, Maintenance & Liability Period for all irrigation, hard and soft landscape items following Practical Completion and ongoing rectification of defects	24	Months	$2,000.00	$8,000.00	$48,000.00	$192,000.00
	Subtotal					**$48,000.00**	**$192,000.00**
	TOTAL					**$4,473,380.00**	**$6,566,990.00**
10.00	**CONTINGENCY SUM 20%**					**$894,676.00**	**$1,313,398.00**
	TOTAL WORKS (EX GST)					**$5,368,056.00**	**$7,880,388.00**

Proposed Development

Hotel Site Redevelopment, Civic Centre Upgrades, OPH Cemetery Upgrade, Water Corp Additional Tower

ACTIONS GOING FORWARD

To achieve the vision of the Port Hedland Consolidated Foreshore Master Plan the implementation of the following is recommended:

- Development of a town coastal processes adaptation strategy.
- Continuous Dual–use Foreshore Path Project.
- Cooke Point Drive realignment and traffic separation projects.
- Town wide Turtle Management Plan (including an investigation into beach renourishment opportunities and guidelines for foreshore development).
- Off-road vehicle rationalisation project.
- Detailed Marapikurrinya Park Precinct Plan including: New Public Jetty, Art and Cultural Centre, Seafood market/restaurant, market stall space and park/POS area.
- Detailed Bert Madigan Park Precinct Plan, following finalisation of marina development plans.
- Detailed Civic Centre, Koombana park, Hotel precinct plan.
- Town Parking Strategy.
- Beach access / track rationalisation/ dune revegetation project.
- Indigenous cultural management plan.

APPENDIX DOCUMENTS

- Port Hedland Foreshore Masterplan Environmental Synopsis – Dr Dave Deeley Acacia Springs Environmental
- Port Hedland Foreshore Masterplan Design Goals, Objectives And Directions Including Demographic Perspective Of Users Planning Synopsis – Ian Brayshaw Urbanplan
- Port Hedland Foreshore Masterplan Public Art report – Jenny Kerr Art Consultant
- Proposed Development Conceptual Documentation

UDLA - Town of Port Hedland

Port Hedland Foreshore Master Plan

Environmental Synopsis

A report by Acacia Springs Environmental

Job number: ASE13003

April 2013

UDLA - Town of Port Hedland

Port Hedland Foreshore Master Plan

Environmental Synopsis

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Cover Illustration: *Modelled 1:500yr innundation of Port Hedland with 2110 sea level rise scenario (Cardno, 2010)*

9th April, 2013

Contents

1. Generic Environmental Issues

The key environmental challenges facing Port Hedland were identified in the Pilbara's Port City Implementation Plan (DOP, 2012a) and were summarised as:

- Protecting and preserving coastal and marine environments;
- Protecting the region's unique flora and fauna;
- Adapting to the challenges of climate change and anticipated sea level rise, and mitigating the risks presented by the region's unique climatic factors including cyclone events and storm surges, and;
- Managing growth to avoid environmental health risks associated with contamination, noise/vibration, incompatible land uses and dust.

In response to the environmental challenges identified above, the Pilbara's Port City Growth Plan (DOP, 2012b) made a number of core recommendations. The core recommendations from the growth plan included:

- Proactive environmental investigations (e.g. flora/fauna, water management, contamination, coastal setbacks etc) for priority land release sites to inform timely identification of design responses and management actions.
- Active monitoring of environmental factors (quality, quantity etc) to inform ongoing development, land use and management actions (e.g. air quality, noise, water quality etc).
- Facilitate and encourage increased State/Local Government agency capacity and coordination with regard to the timely consideration of environmental approvals and identification of long term strategic initiatives (e.g. change adaptation and resilience initiatives).
- Flooding, water management and drainage considerations are critical matters to be resolved. This includes the modelling of potential flooding, storm surge impacts and noise modelling in the case of potentially sensitive land uses.

The following directions and actions have been summarised from the Pilbara's Port City Growth Plan (DOP, 2012b).

1.1 Conserving Biodiversity and Ecosystems

To conserve and protect the areas of high biodiversity value and regionally significant ecosystems through:

- Conservation of mangrove ecosystems of very high value which occur outside designated industrial and associated port areas.
- Conservation of benthic primary producer habitat through the application of impact avoidance and minimization principles.
- Protecting important marine turtle nesting sites through avoiding, managing and mitigating light impacts.

Specific actions have been derived from a review of a range of environmental reports provided by the Town of Port Hedland and are summarised in the following sections.

Mangroves

Environmental assessments for the proposed Pretty Pool residential development identified 40 Ha of mangrove habitat adjacent to the subject area as supporting a healthy mangrove ecosystem (RPS, 2009c). Mangroves of the Pilbara coastline are more exposed and are influenced more often by wind and wave action than more protected communities in the Kimberley (Pendretti and Paling 2000). Mangrove communities at Port Hedland in addition to providing habitat for various birds and marine intertidal animals also play an important role in stabilizing softer sediments in the intertidal areas. The results of a coastal setback modelling study indicate the foreshore area around Pretty Pool is relatively stable with some erosion occurring at the mouth of Four Mile Creek, northeast of the development site (MP Rogers and Associates 2006).

The Pretty Pool area and its mangrove communities have been listed on the Register of the National Estate (Indicative Place) due to their representation as comprising intact tidal flats and mangrove forests typical for the northwest coast of Western Australia.

Management objectives for these mangrove communities should ensure that impacts of development on mangrove habitat and ecological function of the mangroves in these areas should be reduced to the minimum practicable level (EPA 2001). It has been concluded that changes in hydrology and increasing nutrient inputs from stormwater associated with residential developments has the potential to cause adverse impacts on mangrove communities.

Local people are sometimes unaware of how relatively benign activities can lead to adverse environmental impacts with increasing numbers of people. Without good information, some community members resist change because of historical precedent. Providing good information and signage together with appropriate management of human and vehicle access can avoid adverse impacts. For the Pretty Pool area, a track currently runs along the western fringe of the mangroves leading to the samphire flats and to Four Mile Creek. People use this track to access Pretty Pool Beach, fishing and boating locations at the mouth of Four Mile Creek. Vehicle access along this track may need to be managed to avoid erosion of samphire, the dunes and encroachment into the mangrove habitat particularly in the face of predicted population increases.

Migratory shorebirds

Information presented here has been summarised from the Migratory Shorebird Management Plan for the proposed Pretty Pool residential development (RPS, 2009e). The foreshore area adjacent to the development has been identified as roosting and foraging habitat for migratory shorebirds (Metcalf and Bamford 2006). Many of the shorebirds identified in this area are protected under State and Commonwealth legislation requiring all developments, design and management efforts to include measures for their protection.

Information summarised from the RPS management plan shows that migratory shorebirds use the area including the intertidal zone, Pretty Pool Creek, Four Mile Creek, Pretty Pool Beach and samphire habitat for foraging and roosting during migratory periods (September–November and March–April). Although there is limited information available for shorebird utilization of habitat along the entire length of the Port Hedland foreshore, the management opportunities identified for the Pretty Pool residential development in the RPS plan will probably apply more generically.

Human disturbance

Excessive disturbance along the foreshore could prevent shorebirds from feeding in certain areas or by concentrating birds in less disturbed areas thus putting greater strain on available food resources. Excessive disturbance at feeding or roost sites could prevent shorebirds from building up the fuel stores required for successful migration. Undisturbed roost sites above the high tide area adjacent are required for the birds to interact, preen, digest food and rest while waiting for the ebbing tide to re-expose the feeding areas.

Walking of dogs off the lead provides unhindered access to extensive areas used for roosting. This is of significant concern as it scares the birds to flight en masse. Repeated disturbances during roosting periods (particularly before or after migration) can be particularly detrimental for shorebirds as they use critical energy that is required for migration and breeding when they take flight.

Beach access

The combined effects of off-road vehicle use, horse riding, dog-walking, site-seeing and beach fishing around Pretty Pool Beach and beyond are likely to be having a significant effect on potential roosting and foraging habitat of shorebirds in the area. The predicted population increase for the locality is expected to increase the number of local residents using the area for recreational activities during the day which unless managed wisely, is likely to adversely impact feeding and roosting shorebirds.

Most people using the beach are locals who have little idea that the cumulative effect of their relatively benign activities have the potential to adversely impact these import bird communities during their critical breeding and pre- and post-migratory recovery periods. It has been found elsewhere that a combination of community information, appropriate signage and access restrictions during key shorebird periods has been helpful in managing shorebird disturbance.

Artificial lighting

Artificial lighting from the development area may directly disturb roosting birds and turtles at night when they are present. The areas surrounding the development area will be more illuminated, potentially increasing the risk of mosquitos, and predation by foxes and domestic cats (RPS 2009a,b,e).

Nesting turtles

Flat back turtles regularly nest at Cemetery Beach and in areas adjacent to Pretty Pool. Flat back turtles are threatened (listed as rare or likely to become extinct) and are protected under international conventions, national laws and plans and Western Australian legislation. Flat back turtles are one of only two species of marine turtles without a global distribution and are restricted to the southeast Asia-Australian region. The Port Hedland turtles comprising from 100-750 individuals are considered a small proportion (3–6%) of the North West Shelf Management Unit. The flat back turtle nesting season in the Port Hedland area and in the Pilbara region extends from October to February with a peak in December and January (CHEA 2006).

The cumulative threats to the Western Australian flat back turtle population are numerous but unquantified. The main threats include excessive fox, dog and varanid predation of eggs and hatchlings at various rookeries within Western Australia (Limpus 2009). The development of coastal areas of Western Australia, particularly oil and gas facilities, ports and residential development often result in alterations to light horizons and increased human activities at nesting habitats, which can lead to nesting disturbance and hatchling disorientation (RPS 2009a).

At Port Hedland, hatchlings have been recorded in the upper areas of the dunes at Cemetery Beach, on Sutherland Street (adjacent to Cemetery Beach) and in the front yards of houses in the north-eastern coastal area of Port Hedland (K. Howlett pers comm. 2006). This suggests that the existing lighting along Cemetery Beach is causing disorientation to hatchlings attempting to reach the ocean. The lighting along Sutherland Street comprises 6 m high roadside street lighting, external lights from houses, hotel lights and a floodlight within the Council Offices. Some of these direct light sources are about 20 m from the Cemetery Beach. There is also illumination from existing foreshore housing at Pretty Pool, however the effects from these light sources is unknown (RPS 2009a).

Any landscape design and management works must include measures to ensure the protection of flat back turtles, particularly in response to an expected increase in human population and activity. Management options during the nesting season should include controlling human access, reducing light emissions and feral animal (fox and cat) control. Quality information for the public and signage can assist in the management of adverse impacts on flat back turtle populations.

1.2 Climate Change and Sea Level Rise

The Department of Planning and the Town of Port Hedland in their joint *Port Hedland - Pilbara Port City Implementation Plan* (DoP, 2012) stated that one of the main goals concerning climate change was:

> *The protection and enhancement of natural environmental and cultural assets, biodiversity, air and water quality, and building resilience against the long term effects of climate change*

The Port Hedland Growth Plan has highlighted coastal vulnerability, notably major flooding events associated with cyclonic activity and storm surge, noise and dust, contaminated sites and biodiversity as the significant environment considerations in and around the Town of Port Hedland.

Shifts in climate regimes have the potential to significantly impact the Port Hedland community, its infrastructure and local fauna and flora. Exactly how human-induced changes to the climate will manifest in the future is unknown at present. Modelling indicates that northern WA is likely to become warmer and wetter, but with a greater range in rainfall extremes. This will lead to variable responses across the landscape, but is likely to result in more frequent and intense dry season wildfires and more intense storm events and cyclones.

Major flooding events in Port Hedland are typically associated with a combination of storm and cyclonic rainfall activity and coastal storm surge. Heavy rainfall in interior locations can lead to localized flooding along the major river systems of the De Grey, Turner and Yule, which has the potential to impact low-lying areas, whilst storm surge events can lead to localized flooding and inundation of coastal areas.

The effects of a changing climate are expected to increase the frequency and intensity of cyclonic activity and rainfall events. This situation is likely to result in an increased risk of localized flooding in coastal localities, low-lying areas and along creek lines. Furthermore, the sustained effect of coastal processes on shorelines over long term planning periods, combined with forecast increases in vertical sea level height, points towards a dynamically changing coastline alignment. This has significant long term implications for land use planning and development in coastal areas and low lying areas prone to flooding in high rainfall events.

The Port Hedland Coastal Vulnerability Study (Cardno, 2011) has modelled the impact of major storm surge and flooding events in Port Hedland, along with potential changes in shoreline condition over a 100 year planning period. Issues of importance for the foreshore master plan include:

- Areas identified at risk of storm surge inundation and catchment flooding (of varying depths) include the West End (particularly the town centre and light industrial areas), undeveloped areas of the East End, much of the Port Authority lease area, Wedgefield, Dampier Salt, Redbank, Port Hedland International Airport and much of South Hedland and surrounds (particularly that area west of South Creek).
- There is a low lying section of shoreline east of the spoil bank (approximately 6 mAHD) which potentially serves as a break through point for major storm surge flows, directing water into lower lying land behind the coastal ridge line and along Wilson and Anderson Streets.
- The Spoil Bank is inundated in both the 100 year and 500 year ARI event, with only a small portion left unaffected.
- Shoreline recession due to sea level rise and coastal processes potentially affects much of the existing developed area immediately adjacent to the coast in the West and East Ends of Port Hedland.

In light of the Coastal Vulnerability Study findings and the anticipated effects of climate change, the Growth Plan advocated the following responses and planning/development actions:

- Further planning and development investigations in flood and storm-surge affected areas should demonstrate further detailed consideration of local flooding impacts and necessary mitigation/adaptation responses.
- In areas potentially at risk from coastal storm surge flooding, any developments should incorporate allowance for a vertical sea level rise over a 100 year planning period.

1.3 Sustainable Natural Resource Management

Sustainable natural resource management should be fostered through actions designed to protect the landscape, landform and the identified environmental assets of Port Hedland during development. These actions were to include appropriate Coastal Process and Foreshore Assessments, should any development proposals be expected to impact upon either the existing coastal processes or foreshore reserves.

Water Supply

As indicated previously, the supply of bulk potable water to the Town of Port Hedland is provided through the Water Corporation which operates the Port and South Hedland Water Supply Scheme. The scheme is reliant on groundwater extraction from the Yule and De Grey rivers which is currently fully allocated. Key strategies to overcome the water supply constraints include:

- Adoption of maximum water efficiency principles for existing development and encouragement of water efficiency outcomes for all new developments, and;
- Reduce the reliance on potable water where it can be substituted with a non-potable supply.
- Financial investment in energy and water audits and retrofits of industry and housing stock should be undertaken immediately to reduce water consumption.

Wastewater

Due to the fully allocated existing potable water supply and the planned expansion of Port Hedland, the Water Corporation may need to accelerate plans to investigate waste water reuse through managed aquifer recharge as it does on the Gnangarra Mound and for providing treated waste water for landscape irrigation. This would assist the Corporation to meet its elusive reuse targets specified in its 'Water for all Forever' strategy.

Stormwater management

Stormwater runoff from heavy rainfall associated with monsoons and cyclones can cause significant damage to ecosystems. Large volumes of water moving quickly through areas can cause localized mortality of animals and damage key nesting habitat (DEC 2009). Guidelines in the DOW's Stormwater Management Guidelines state that: runoff from a 1:1 year Average Recurrence Interval (ARI) event will be retained on site. Run-off from all impervious areas (i.e. Roads, paving and buildings) will be directed to a series of retention basins. Large and infrequent storm events will be mitigated through the use of 'soft engineered' retention basins capable of holding a 1:10 year ARI event (DoW, 2007). Nutrients and other contaminants in stormwater runoff should be detained and managed in a chain of retention basins (RPS 2007b).

Local Environmental Amenity and Pollution Reduction

In addition to the presentation of environmental assets and change adaptation, at a local level there remains a need to ensure that the quality and amenity of existing urban areas and local environmental attractions are maintained to a high standard. Local amenity improvement programs, litter and waste schemes can all significantly help to improve the attractions of the town and increase community pride and ownership.

Dust and noise management

Dust and noise levels in the Port Hedland have historically been above currently accepted recommended levels. The high concentrations of dust that exists in the West End of Port Hedland presents potential health risks to the local residents. Noise and vibration from the existing and planned road and rail transport network and the airport could affect the amenity of future residents.

The following management actions may serve to ensure the health and amenity of the local and future residential population is not adversely impacted:

- Compliance with the recommendations of the Dust Management Task Force with regard to the implementation of Environmental Management Controls and Land Use Planning.
- Vegetation plantings around the Town Foreshore to assist in noise and dust management.

Landscape form

The landscape design philosophy for Pretty Pool is aimed at creating a lush, cool oasis through climate responsive solutions that combine shade, reduced maintenance and water efficiency. Key tools for achieving this include appropriate plant selection, efficient garden set out and Xeriscaping. The key elements of Xeriscape gardening are:

- Use of plants that are hardy in local conditions;
- Use of micro irrigation and water conservation practices;
- Use of mulches and soil conditioning to retain soil moisture;
- Appropriate selection of plant species.

The most crucial issue identified for the Port Hedland region is the distinct lack of shade. Tree planting can assist in increasing the public's utilization of open spaces and in climatic control of internal living spaces by reducing direct sunlight on windows and doorways. Shade trees also add to the visual appeal whilst requiring little or no maintenance once established. Landcorp as part of its Pretty Pool residential development strongly encouraged owners to plant a shade tree from the following species list at the front of their properties. It was also recommended that additional shade trees be planted at the rear of properties (Landcorp 2009).

Table 1 Trees recommended for Port Hedland (Landcorp 2009).

Species	Common name	Species	Common name
Azadirachta indica	Neem Tree	*Brachychiton gregorii*	Desert Kurrajong
Tababuia palmeri	Pink Trumpet Tree	*Eucalyptus aspera*	Rough leaf range gum / brittle range gum
Tipuana tipu	Yellow Jacaranda	*Cassia fistula*	Golden shower
Eucalyptus terminalis	Bloodwood	*Eucalyptus coolibah*	Coolibah
Acacia aneura	Mulga	*Eucalyptus dichromophloai*	Variable barked bloodwood
Acacia coriacea	Desert oak / Dogwood/ Wirewood	*Lysiphyllum cunninghamii*	Native bauhimia
Brachychiton australie	Rock Kurrajong	*Melaleuca leucadendron*	Cadjeput

Mosquitos & midges

Mosquitos and midges (biting and non-biting) have the potential to reduce outdoor amenity for local residents. Mosquito borne diseases such as Australian Encephalitis, Ross River Virus and Barmah Forest Virus have been

found in the Pilbara region, with a greater risk during the wet season. Mosquitoes and midges are endemic to the Pilbara, are a part of the salt marsh ecosystem and are an important link in the environmental food chain. Tidal inundation and the ponding of water pose the greatest challenge to mosquito and midge management. At the household scale, areas of stagnant water in gardens, ponds and water features are potential breeding sites for mosquitoes and midges.

The Town of Port Hedland maintains an active surveillance program and monitors mosquito numbers risks. Intervention to manage mosquitos and midges includes habitat modification such as runneling to reduce stagnant breeding pools, application of larvacides and fogging to kill adult insects. Physical factors such as street lighting can lead to aggregations of mosquitos.

Any landscape design or management works should consider as a general principle, measures that minimise the prevalence of mosquitos and midges. This includes minimizing the possibility of (storm)water ponding and stagnation during design and construction and careful selection and design of lighting options including avoiding the use of outdoor white lighting in the immediate vicinity of salt marshes or areas of (temporary) standing water. High pressure sodium lights have been found to be less attractive for mosquitoes and midges. Quality information can also assist residents in managing the mosquito and midge nuisance.

Re-vegetation

The Port Hedland foreshore has many informal tracks and access ways. It has been found elsewhere that significant wind and water erosion can occur from denuded areas. As a general principle, all existing foreshore access tracks that are not required as a priority should be closed and remediated by shallow ripping, adding topsoil as required and revegetated with suitable local species endemic to the area (RPS, 2009d).

Weed control

Plants that are endemic to an area provide a range of benefits including erosion control, habitat for a range of soil, litter and above-ground organisms, helping to maintaining the moisture and temperature balance of surface soils and other aesthetic benefits. Weeds usually colonize degraded areas and in sufficient numbers, can outcompete local species and invade healthy natural and cultivated spaces. As a general principle, all landscape management and design activities should routinely include consideration of weed control during construction and establishment.

Pedestrian and Cycle Networks

The Cycle Plan identified some notable gaps in the existing network and facilities including:

- Links between Port Hedland, Pretty Pool and South Hedland;
- Link connecting the existing coastal path with the Port Hedland Town Centre (West End);
- Extension of the coastal path along Dempster Street and Goode Street to Cooke Point;
- Installation of bike lanes;
- Upgrade of existing footpath surfaces; and
- Installation of bicycle parking rails at appropriate locations (U-rails recommended).

2. Environmental Issues for Precincts

2.1 Town Foreshore and Spoilbank Precincts

Note: The following considerations apply to all precincts.

Issue: Inundation during storm surge

Areas identified at risk of storm surge inundation and catchment flooding (of varying depths) include the West End particularly the town centre and light industrial areas. Ensure all infrastructures at risk of inundation are built to withstand temporary flooding.

Issue: Water supply and irrigation

Finite potable water supplies mean that areas of irrigated landscapes should be kept to a minimum. Recycled water should be used where possible particularly for dust suppression.

Issue: Stormwater management

Runoff from hard surfaces from a 1:1 year Average Recurrence Interval (ARI) event will be retained on site. Run-off from all impervious areas (i.e. Roads, paving and roofs of buildings) will be directed to a series of retention basins.

Issue: Amenity and litter

At a local level there remains a need to ensure that the quality and amenity of existing urban areas and local environmental attractions are maintained to a high standard. Local amenity improvement programs, litter and waste schemes can all significantly help to improve the attractions of the town and increase community pride and ownership.

Issue: Landscape form

The landscape design philosophy for new developments should aim at creating a cool oasis through climate responsive solutions that combine shade, reduced maintenance and water efficiency. Key tools for achieving this include appropriate plant selection, efficient landscape set out and Xeriscaping. The key elements of Xeriscape gardening are:

- Use of plants that are hardy in local conditions;
- Use of micro irrigation and water conservation practices;
- Use of mulches and soil conditioning to retain soil moisture;
- Appropriate selection of plant species.

Issue: Shade

The most crucial issue identified for the Port Hedland region is the distinct lack of shade. Tree planting can assist in increasing the public's utilization of open spaces. Shade trees also add to the visual appeal whilst requiring little or no maintenance once established. Table 1 lists possible exotic and endemic tree species suitable for this precinct.

Issue: Re-vegetation

The Port Hedland foreshore has many informal tracks and access ways. It has been found elsewhere that significant wind and water erosion can occur from denuded areas. As a general principle, all existing foreshore access tracks that are not required as a priority should be closed and remediated by shallow ripping, adding topsoil as required and revegetated with suitable local species endemic to the area.

Issue: Weed control

Plants that are endemic to an area provide a range of benefits including erosion control, habitat for a range of soil, litter and above-ground organisms, helping to maintaining the moisture and temperature balance of surface soils and other aesthetic benefits. As a general principle, all landscape management and design activities should routinely include consideration of weed control during construction and establishment.

Issue: Pedestrian and Cycle Networks

The Cycle Plan identified some notable gaps in the existing network and facilities including:

- Links between Port Hedland, Pretty Pool and South Hedland;
- Link connecting the existing coastal path with the Port Hedland Town Centre (West End);
- Upgrade of existing footpath surfaces; and
- Installation of bicycle parking rails at appropriate locations (U-rails recommended).

2.2 Cemetery Beach - Civic & Sutherland Street Beach Precincts

Note: Generic considerations apply here plus the following:

Issue: Nesting turtles

At Port Hedland, hatchlings have been recorded at the back of dunes at Cemetry Bech and Sutherland Street (adjacent to Cemetery Beach) and in the front yards of houses in the north-eastern coastal area of Port Hedland (K. Howlett pers comm. 2006). This suggests that the existing lighting along Sutherland Street which comprises 6 m high roadside street lighting, external lights from houses, hotel lights and a floodlight within the Council Offices are causing disorientation to hatchlings attempting to reach the ocean. The flat back turtle nesting season in the Port Hedland area and in the Pilbara region extends from October to February with a peak in December and January (CHEA 2006)

Any landscape design and management works must include measures to ensure the protection of flat back turtles, particularly in response to an expected increase in human population and activity. Management options during the nesting season should include controlling human access, reducing light emissions and feral animal (fox and cat) control. Quality information for the public and signage can assist in the management of adverse impacts on flat back turtle populations.

2.3 Cooke Point Precinct

Note: Generic considerations apply here.

2.4 Goode Street Beach and Pretty Pool Precinct

Note: Generic considerations apply here plus the following:

Issue: Mangroves

Environmental assessments for the proposed Pretty Pool residential development identified 40 Ha of mangrove habitat adjacent to the subject area as supporting a healthy mangrove ecosystem (RPS, 2009c). Mangrove communities at Port Hedland in addition to providing habitat for various birds and marine intertidal animals also play an important role in stabilizing softer sediments in the intertidal areas. The Pretty Pool area and its mangrove communities have been listed on the Register of the National Estate (Indicative Place) due to their representation as comprising intact tidal flats and mangrove forests typical for the northwest coast of Western Australia.

Management objectives for these mangrove communities should ensure that impacts of development on mangrove habitat and ecological function of the mangroves in these areas should be reduced to the minimum practicable level (EPA 2001). It has been concluded that changes in hydrology and increasing nutrient inputs from stormwater associated with residential developments has the potential to cause adverse impacts on mangrove communities.

Providing good information and signage together with appropriate management of human and vehicle access can avoid adverse impacts. For the Pretty Pool area, a track currently runs along the western fringe of the mangroves leading to the samphire flats and to Four Mile Creek. People use this track to access Pretty Pool Beach, fishing and boating locations at the mouth of Four Mile Creek. Vehicle access along this track may need to be managed to avoid erosion of samphire, the dunes and encroachment into the mangrove habitat particularly in the face of predicted population increases.

Issue: Migratory shorebirds

Migratory shorebirds protected under State and Commonwealth legislation, use the area including the intertidal zone, Pretty Pool Creek, Four Mile Creek, Pretty Pool Beach and samphire habitat for foraging and roosting during migratory periods (September–November and March–April). Repeated disturbances during roosting periods (particularly before or after migration) can be particularly detrimental for shorebirds as they use critical energy that is required for migration and breeding when they take flight.

The combined effects of off-road vehicle use, horse riding, dog-walking, site-seeing and beach fishing around Pretty Pool Beach and beyond are likely to be having a significant effect on potential roosting and foraging habitat of shorebirds in the area. Most people using the beach are locals who have little idea that the cumulative effect of their relatively benign activities have the potential to adversely impact these import bird communities during their critical breeding and pre- and post-migratory recovery periods. It has been found elsewhere that a combination of community information, appropriate signage and access restrictions during key shorebird periods has been helpful in managing shorebird disturbance.

Artificial lighting from the development area may directly disturb roosting birds and turtles at night when they are present. The areas surrounding the development area will be more illuminated, potentially increasing the risk of mosquitos, and predation by foxes and domestic cats.

Issue: Nesting turtles

At Port Hedland, hatchlings have been recorded within the urban built form which suggests that the existing lighting from housing at Pretty Pool is causing disorientation to hatchlings attempting to reach the ocean. The flat back turtle nesting season in the Port Hedland area and in the Pilbara region extends from October to February with a peak in December and January (CHEA 2006).

Any landscape design and management works must include measures to ensure the protection of flat back turtles, particularly in response to an expected increase in human population and activity. Management options during the nesting season should include controlling human access, reducing light emissions and feral animal (fox and cat) control. Quality information for the public and signage can assist in the management of adverse impacts on flat back turtle populations.

Issue: Mosquitos and midges

Mosquito borne diseases such as Australian Encephalitis, Ross River Virus and Barmah Forest Virus have been found in the Pilbara region, with a greater risk during the wet season. Tidal inundation and the ponding of water pose the greatest challenge to mosquito and midge management. At the household scale, areas of stagnant water in gardens, ponds and water features are potential breeding sites for mosquitoes and midges. Physical factors such as street lighting can lead to aggregations of mosquitos.

Any landscape design or management works should consider as a general principle, measures that minimise the prevalence of mosquitos and midges. This includes minimizing the possibility of (storm)water ponding and stagnation during design and construction and careful selection and design of lighting options including avoiding the use of outdoor white lighting in the immediate vicinity of salt marshes or areas of (temporary) standing water. High pressure sodium lights have been found to be less attractive for mosquitoes and midges. Quality information can also assist residents in managing the mosquito and midge nuisance.

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RPS (2009d) Foreshore management plan. Pretty Pool development, Port Hedland. Prepared for Landcorp by RPS.

RPS (2009e) Migratory shorebird management plan. Pretty Pool development, Port Hedland. Prepared for Landcorp by RPS.

DESIGN GOALS, OBJECTIVES AND DIRECTIONS
INCLUDING DEMOGRAPHIC PERSPECTIVE OF USERS

GOALS FOR THE CONSOLIDATED FORESHORE MASTER PLAN

In devising the Port Hedland Consolidated Foreshore Master Plan, there are four goals that drive the outcomes: land uses, connectivity, attractive and sociability:

Land Use is the integral ingredient in space activation. Attraction to uses makes for interactive use and activation of space. Generation of uses causes visitation by the public that consequently activates space and subsequently community pride.

Connection of places and the surrounding hinterland where people reside is key to successful utility of land use. A successful place is easily accessible and visually and physically linked.

Attractive places with good image, character, charm and proportional built form draw the attention of people. 'Feel-Good' places satisfy comfort levels and result in continuous use and activation of space.

Sociability is a derivative of Attractive spaces. Sociable interaction amongst people develops a stronger community well being and enhances sense of place. A place that fosters social activity grows and flourishes.

DEMOGRAPHIC AND CULTURAL PERSPECTIVE

Port Hedland's economy and associated population growth is extremely dynamic. A major consideration in the Port Hedland Consolidated Foreshore Master Plan is to provide varied activation spaces of interest to encourage interest, interaction, stronger community wellbeing and permanency of population.

It is noted in the Growth Plan for Port Hedland:

> In the medium to long term however, a **move towards greater residential permanency** of the skilled labour workforce will be required to ensure the City continues to **grow and operate in a sustainable and socially inclusive** manner, without having to rely on temporary arrangements.

Further,

> **Reducing the reliance on a FIFO** workforce and **encouraging an increased permanent residential workforce in the long term**.

These are significant considerations for Port Hedland as we move forward.

A contributing means to achieve greater permanency in population and reducing FIFO is through the creation of nodes of interest or activation points that provide residents and visitors with a variety recreational pursuits and places to meet socialise.

An attribute of the demography is the higher levels of socially disadvantaged persons and indigenous persons within the town. The Master plan addresses this attribute

within the activity spaces that sure-up cultural knowledge, inclusion and integration of the young indigenous.

A critical consideration in the creation of activity spaces is linkage between nodes: the importance of recognising nodes do not exist in isolation. This is a theme that is derived from local Aboriginal Culture and must form part of the master planning outcomes, both cultural and connectedness:

> "An integral feature of Port Hedland's Indigenous cultural heritage is connectedness."

It is often unrecognized Hedland has a rich Aboriginal culture including the Karriyarra speaking people living in the Port Hedland area and the Ngarla people living north and Nyamul speaking people south.

The known heritage and places of significance such as Marapikurrinya* (Port Hedland) Two Mile Ridge, Pretty Pool and Twelve Mile Camp become highlights of the master plan. Cultural connection to the land should form part of the Master Plan story, be a benchmark to the themes that run through the Master plan.

Activity space should consider a variety of activity nodes including those that support diversification of economic opportunities. Accordingly retail, commercial and café restaurant uses should form part of the activation of space. Simple things like a seaside evening market in the Wet season, as exemplified in Fremantle's Bathers beach and Darwin's Mindel beach, are classic activity drivers highly sort after.

*Footnote:
The Karriyarra name for Port Hedland itself is Marapikurrinya, referencing the finger-like formation of the tidal creeks that mark the coastline in the harbour: Mara meaning hand, pikurri meaning pointing straight and nya denotes a place name marker.

SHAPING A COSMOPLITAN CITY (FORM)
(yet to be summarised)

CITY GROWTH STRATEGY
West End Precinct
The west End is the Port City's soul; with strong port growth, the City remains friendly and accessible. An Objective of the consolidated Foreshore Master plan is to fortify and improve the friendliness and accessibility of the City.

At different times of the day, the West End offers different opportunities and attractions. While day use is essentially service function, evening use becomes attractive to Tourists observing the Port activity. An Objective of the Foreshore Master plan is to create viewing platforms.

The Foreshore Master plan is to create places of interest for people to meet and socialise.

The Master plan illustrates and promotes:

- Historic land use linked to early development.
- Coastal foreshore environs and harbour.
- Acknowledgment of primacy of Port operations including relocation of boat ramp as alternative locations unfold.
- Plan for flooding and inundation as a result of cyclones and storm surge.
- Indigenous Heritage: Two Mile Ridge and the Cemetery – introduce heritage significance into the Foreshore.
- Linkages between commercial development along Edgar and Wedge Streets.
- Encourage mixed use developments (along main streets and nodal points).
- Promote mixed use north of Anderson Street encouraging forms of retail development and short stay accommodation.
- Demonstrate landscape improvements.
- Create a permanent outdoor entertainment venue.
- Identify site for an Iconic building overlooking waterfront.
- Identify site for an hotel.
- Integration of Spoil bank development opportunities including increased informal coastal access.

Land Use and Activities to be promoted:

- Port Hedland's cultural and commercial core
- Short stay accommodation
- Small boating facilities
- Mixed sue commercial, residential and short stay accommodation
- Coastal parks, nodes and lookouts.
- Landmark waterfront development.
- Activation of West End through placement of nodes to promote continued cultural events fostering arts, education (signage) tourism and entertainment.
- Segregation of heavy haulage transport from light vehicles.

East End Precinct

The East End is considered an urban village forming Port Hedland's primary residential area. Strong links to the foreshore environment and mangrove environs are enhanced to offer residents and visitors closer connection with the land.

The Master plan illustrates and promotes:

- Managed access to the mangrove environs.
- Turtle nesting at Cemetery Beach and Pretty Pool.
- Significant indigenous sites such as Lock Hospital, Pretty Pool, Two Mile Ridge and Point cook Midden.
- Heritage sires including Old Cemetery (upgrade), old train station, Don Rhodes Museum, Pretty Pool.
- Costal dual use path, parks and public art places along foreshore.
- New entry road with direct connection to Coastal Drive.
- Café and restaurants to optimise foreshore and mangrove experience.
- Short stay accommodation adjacent mangrove environs.
- Improve managed coastal access opportunities while addressing environmental impacts.

- Future relocation of the Racecourse and Waste Water Treatment plant to facilitate residential development within the parameters of storm surge and cyclone influences.

Land Use Activities to be promoted:

- Mixture of residential densities and increase to densities in select locations to take benefit of proposed foreshore nodes.
- Protection of Mangrove environs that reflect landscape character.
- A landscape buffer separating peninsula residential from heavy haulage traffic.
- Protection of foreshore habitat including impact of lighting and education about fatback nesting Turtle.
- Create coastal parklands and nodes of activity including lookouts.
- Create opportunities to improve the knowledge and relationship with the mangroves and its protection.
- Improve managed access to the coast.
- Activate the local centre through art, events and improve dining opportunities at select nodal points.

Strategies for Strengthening Local Community and Culture

Refer to Figure 5.10 in the Growth Strategy that provides a framework for community development and place making strategies; include this approach in development of the foreshore places and activation of spaces.

Objective
Create places to allow creativity to flourish while investing in the quality of the events and capacity of organisers.

Engagement Initiatives
Preserve languages and links to the Western Desert cultures.
Network creative people with entrepreneurial people and organisations and encourage seed funding support initiatives.

Objective
Increase community participation and sense of belonging
Engagement Initiatives
Cluster cultural land uses within walkable distances in the West End.
Provide reasons to walk, cycle and get out of the vehicle and engage with public spaces through improved urban design and public art initiatives.

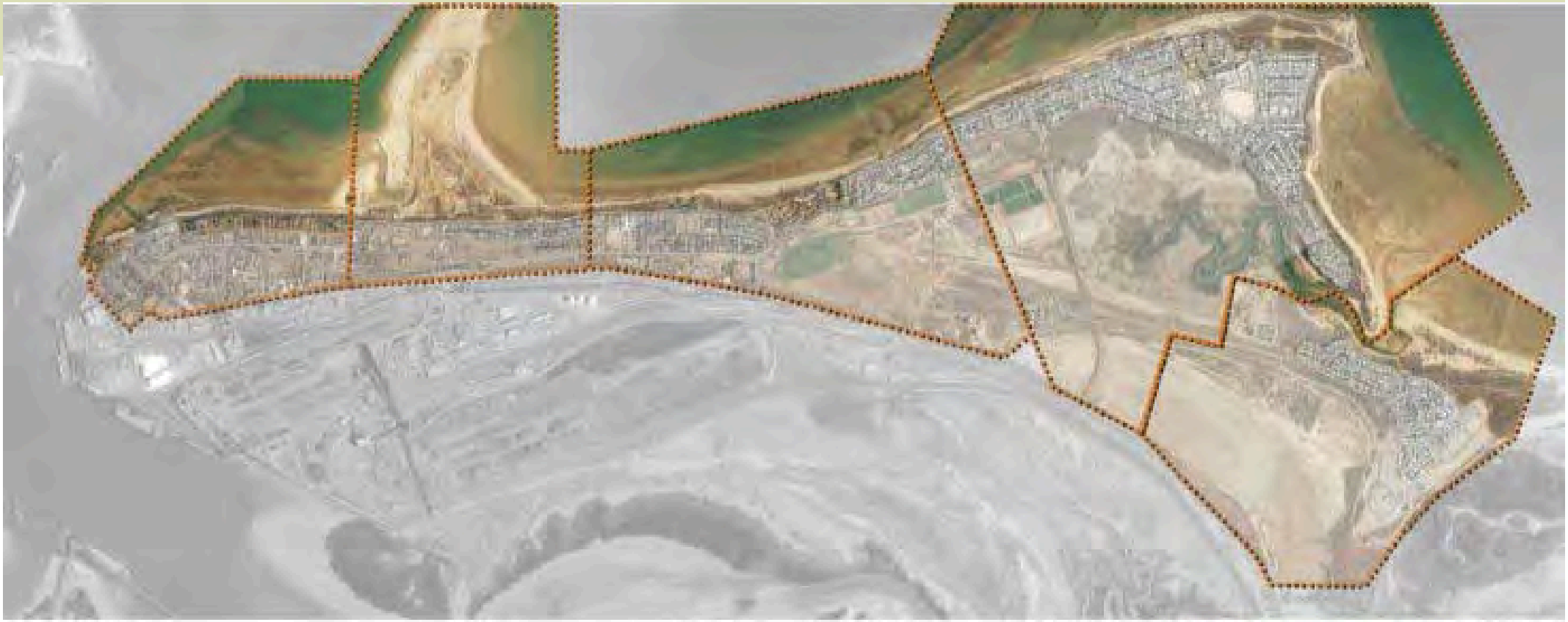
Objectives
Enhance sense of place during growth periods

Engagement Initiatives
Celebrate cultural (indigenous and non-indigenous) natural, historical and community assets.
Develop opportunities for cultural expression in contemporary forms.

Design Goals Objectives and Outcomes including Demographic Perspective of Users

PUBLIC ART MASTER PLAN

PORT HEDLAND FORESHORE



Jenny Kerr for UDLA _Town of Port Hedland May 2013

Introduction

Making culture visible

The Town of Port Hedland seeks to protect and enhance the utility, amenity and identity of the public spaces such as the town centre, commercial nodes, main streets, entry points, squares, foreshores and parks within its municipality. The Town believes the provision of quality, site-specific art in the public spaces of Port Hedland is one way to this can be achieved.

Public art in Port Hedland aims to:

- Enhance and add character to the built environment.
- Develop community identity and storytelling.
- Enhance a sense of place
- Engage and stimulate enquiry into the history and cultural heritage of the area.

The town defines 'Public Art' as being site-related and place-responsive art created and located for public accessibility, either within or readily visible from, the public space.

The plan for consolidated approach to the development of the Port Hedland Foreshore presents an opportunity to interpret, and express the unique identity of this place with the relevant placement, integration and meaningful provision of public art.

Integrated

Artists working with the design team can add meaning and value to functional infrastructure projects. The Port Hedland foreshore walkways, jettys, lookouts, shelters, bridges and architectural features are opportunities for this approach.

Stand-alone

Plan places with space to allow sculpture to 'sing',
Sculpture can provide a landmark or an intimate surprise experience that engages us physically, intellectually and spiritually, and connects us to a place.

Interpretative

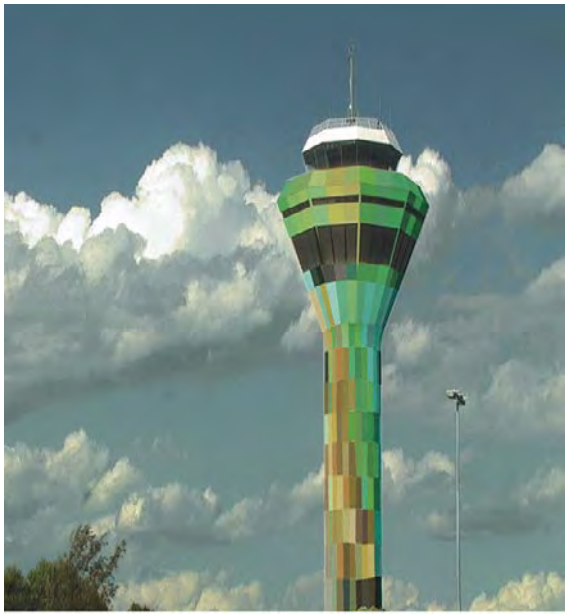
Art works that draw attention to natural phenomena or historical events can help us to see a familiar place with new eyes.

Ephemeral

Light, sound and performance art in the public realm is a real time experience in a site-specific context. Allow spaces to be used for this purpose and provide infrastructure support.
The Port Hedland harbor, ore piles, salt pans, mud planes, spoil bank and seemingly endless land and ocean horizon provide a unique context for ephemeral art.

Memory marker

Or Memory makers provide a canvas for interpretive graphics and text. Integrated to offer a meaningful experience of a unique site.

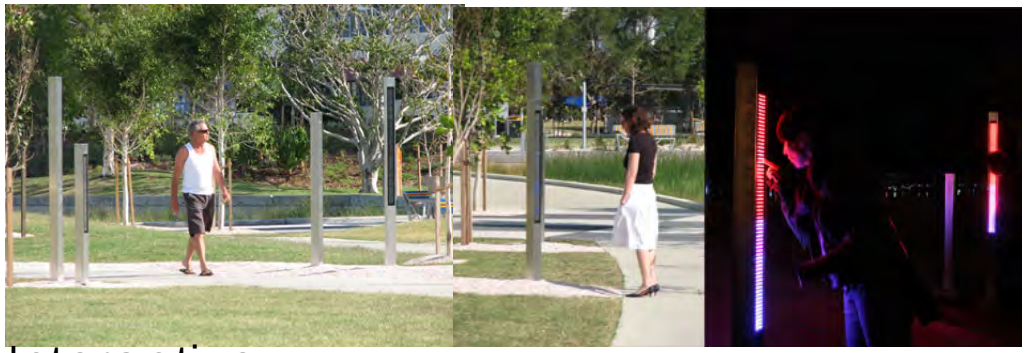


Directional

Art treatments can have an impact when viewed from afar and engage at close inspection.

Play

Artistic elements can inject humour and a sense of fun to create vibrant and engaging spaces or mark trails and walk ways.



Interactive

Sound and light artworks can Invite participation, enhance pedestrian experience and provide information about a place, people and activities.

Embedded

Pavement treatments can inform, create interest and make connections at specific locations along walkways, at lookouts and platforms.

Existing public art

Provision of public art along and around the foreshore is to consider the location, type and theme of the number of existing artworks. Port Hedland has well over 50 artworks situated in the public realm. A small number created by local artists.
Artworks situated along the foreshore and the town centre in Port Hedland include works by Mathew Harding from Victoria; local artists; Ann Sibosado, Esther Quintal, Irene of Spinifex Hill, Fred Beel and Rozy Dann and Perth artists; John Tarry; Coral Lowry (with Rozy Dann(; Jon Denaro, Creepy and Chris Nixon.

Local Artists in Port Hedland

Port Hedland has a thriving arts community with a growing capacity for taking on public art commissions.
Can be contacted through The Court House Gallery,
Spinifex Hill Art Centre, and Hartz.

Theme

Relevant themes for public art along the foreshore

	Theme	
1	The natural environment - flora - mangroves, wild and old.	
2	The natural environment - fauna – turtles, birds, fish	
3	The natural environment – climate – tides, heat, cyclones.	
4	Aboriginal people associations to this area. The cultural heritage of Port Hedland is a multicultural melting pot, various languages, symbols.	
5	Ships, ship wrecks, ship destinations	
6	Settlement history, social history	
7	Particular families and associations	

Sites as located on plans

THE BEACON DEVELOPMENT A vision for Port Hedland

JULY 2011

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MASTER PLANNING
PROJECT ADVISORY

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BALI

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PD 1.1

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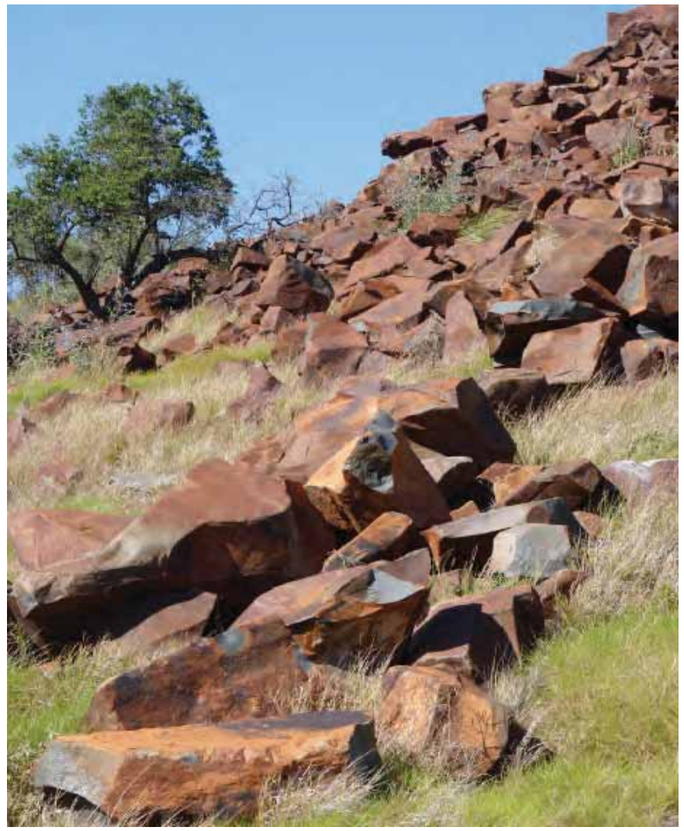
VISION STATEMENT

- TO CREATE A BOLD STATEMENT REPRESENTING & SYMBOLISING PORT HEDLAND.
- TO CREATE A NEW AND VIBRANT PLACE FOR PORT HEDLAND.
- A "FOCAL POINT" + BEACON.
- A PLACE TO SHOW THE TOWN – ITS INDUSTRY, ITS HISTORY AND IT'S FUTURE.
- A PLACE FOR PEOPLE
  - TO MEET
  - TO GATHER
  - TO RELAX.
  - TO WORK
  - TO LIVE
  - TO LEARN.
- TO SHOW THE SHIPS
  - THE SEA.
  - THE PORT
- BUT THERE'S MORE TO THE TOWN THAN INDUSTRY + IRONORE. THIS IS AN OPPORTUNITY TO SHOW –
  - THE ECOLOGY
  - THE ABORIGINAL + INDIGINOUS CULTURE
  - THE LANDSCAPE
- TO PROVIDE FOR THE FUTURE NEEDS AND DEMANDS FOR RETAIL, COMMERCIAL, BUSINESS + LEISURE SPACE.



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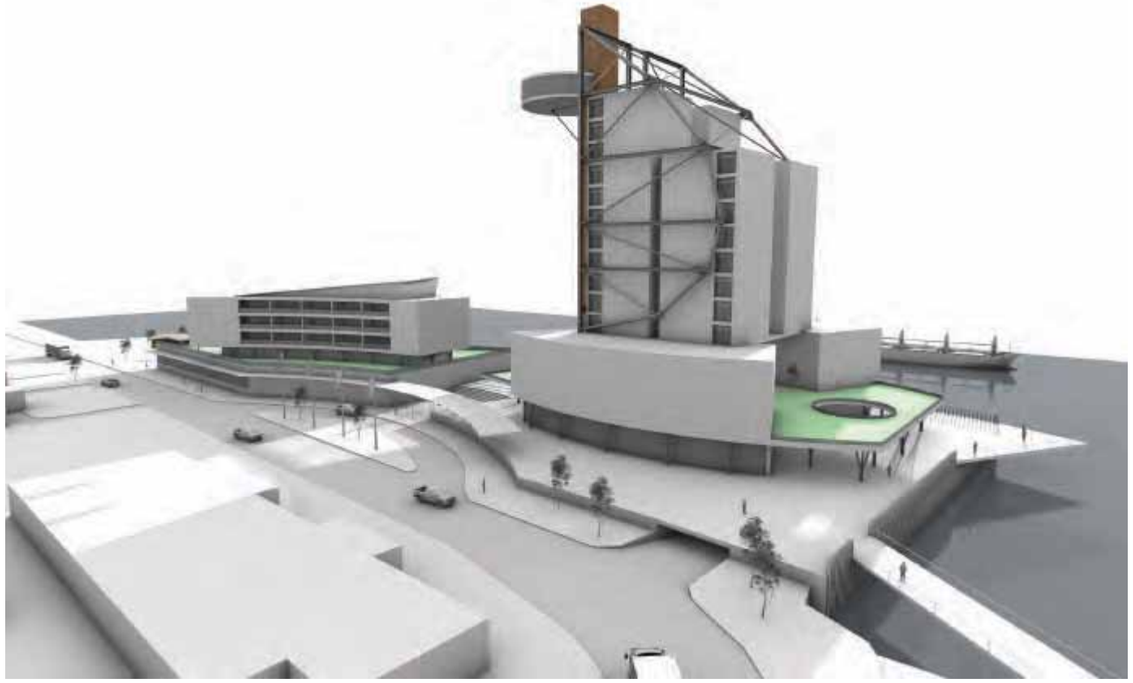

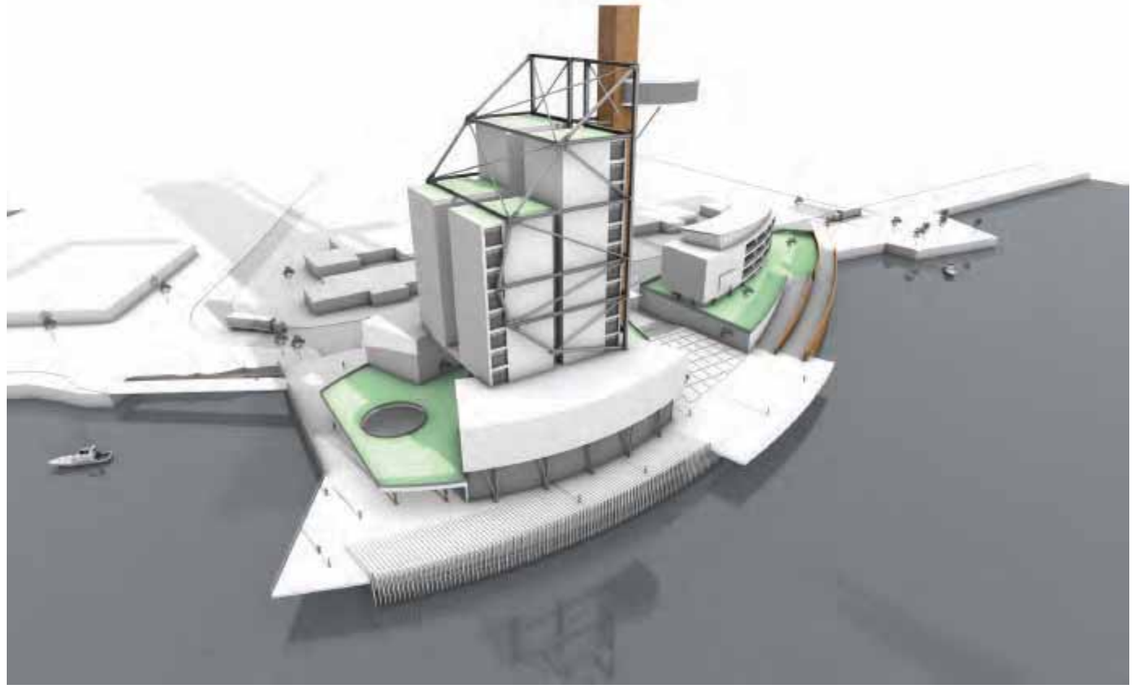

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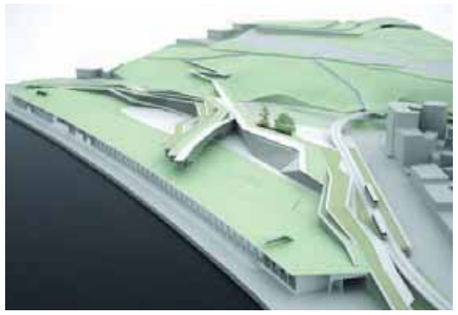
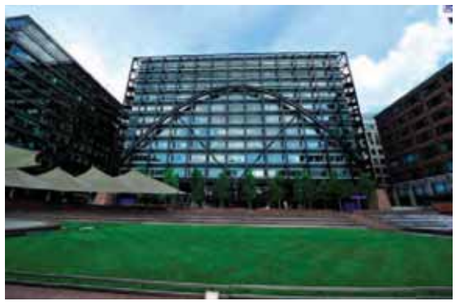
INSPIRATION

- MANGROVES.
- MECHANISATION + PORT ACTIVITY
- SHIPS / HULLS.
- CLIMATE / VENTILATION / SHADE
- PILBARA LANDSCAPE / IRON ORE
- ABORIGINALITY.
- NAVIGATION POSTS.
- A "GARDEN CITY".





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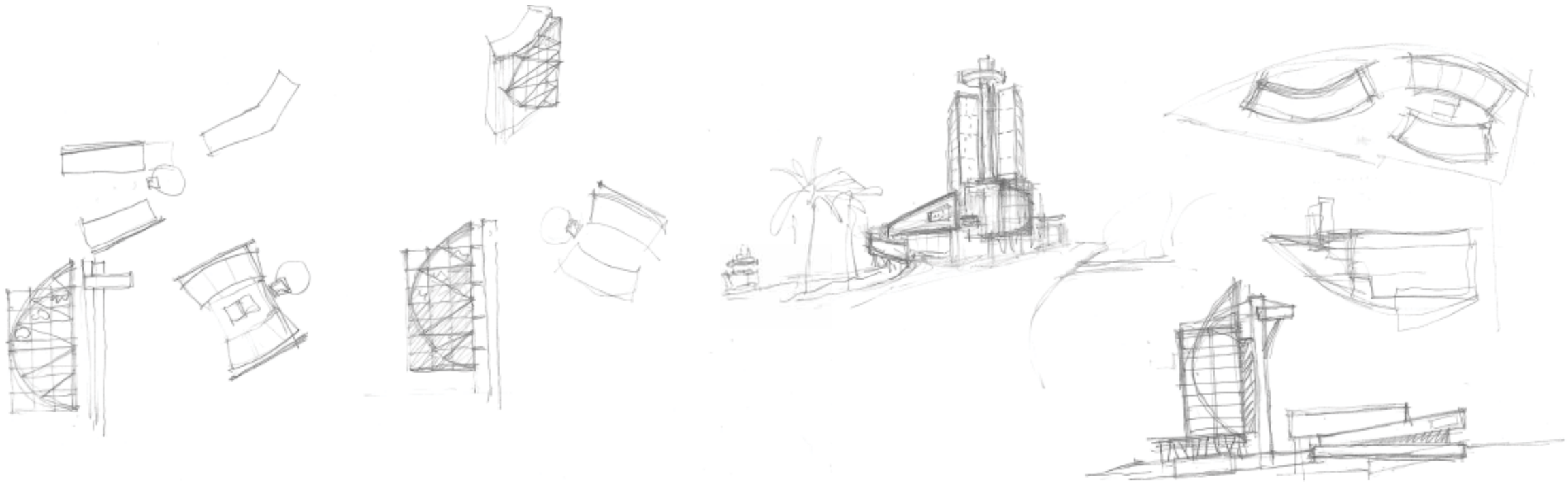

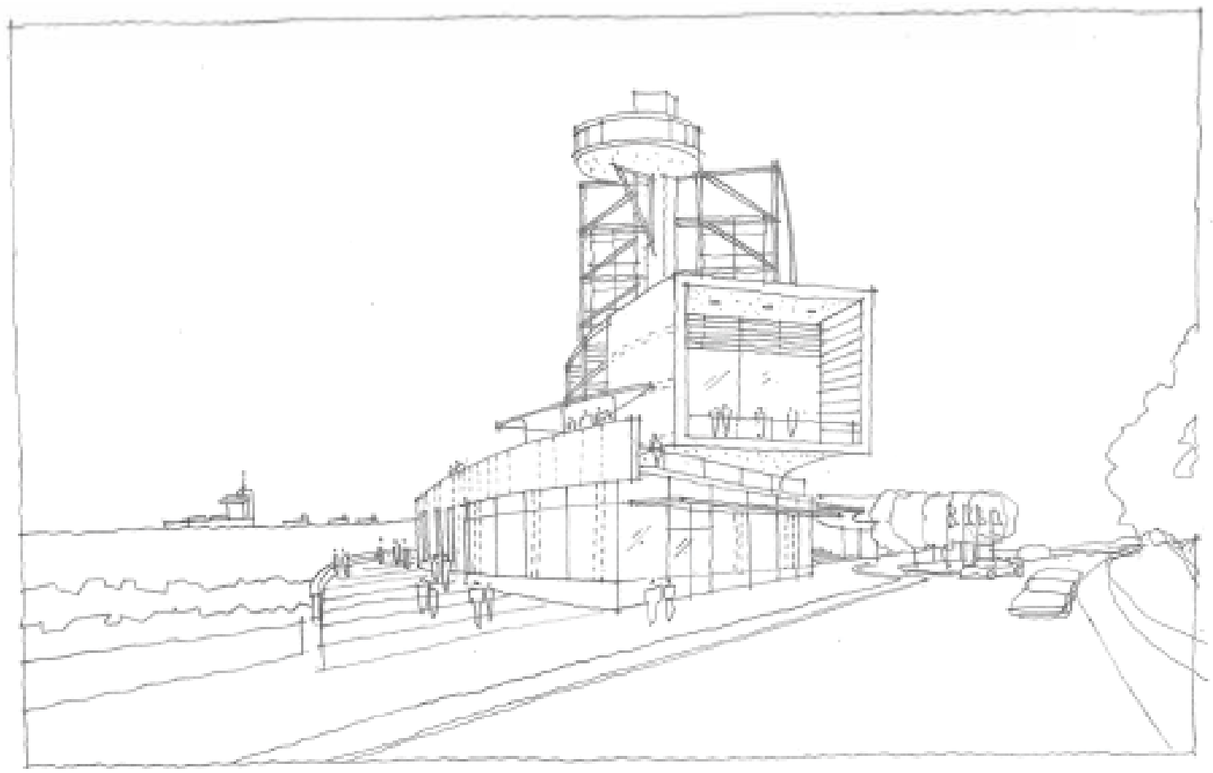

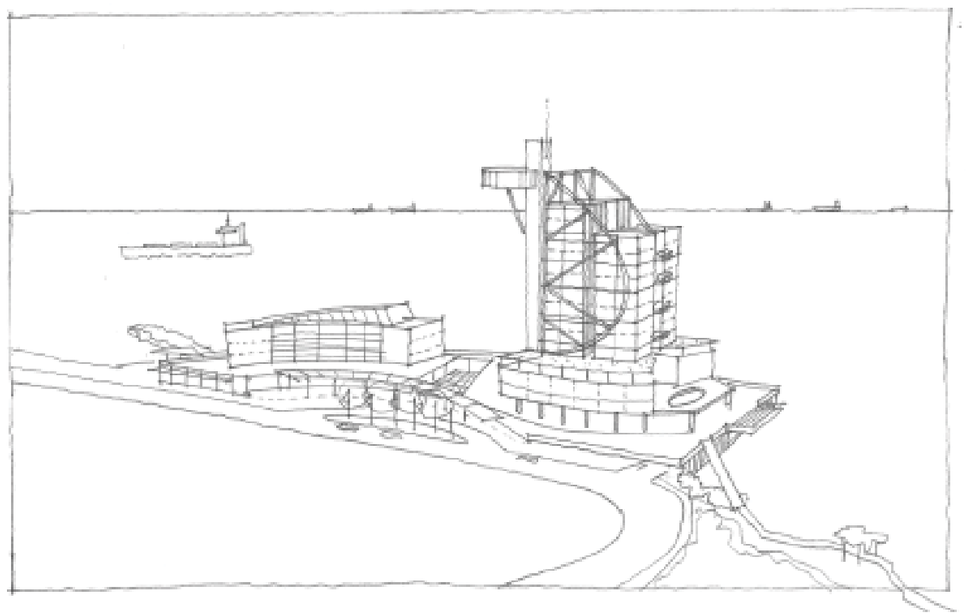

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MASTER PLANNING
PROJECT ADVISORY

MARGARET RIVER
BALI

willcox.

WILLCOX & ASSOCIATES PTY. LTD. **ACN** 008 928 149 **ABN** 90 077 844 372 **MARGARET RIVER** UNIT 7 119 BUSSELL HWY MARGARET RIVER WA **T** +61 8 9757 3111 **F** +61 8 9757 3110
BALI JL. BADAK II 2B SUMERTA KELOD RENON DENPASAR 80235 BALI **T** +62 0361 239601 **F** +62 0361 239601 **M** PO BOX 122 MARGARET RIVER WA 6285 **E** admin@willcoxassociates.com

SITE ANALYSIS
nts

THE BEACON DEVELOPMENT A vision for Port Hedland
JULY 2011

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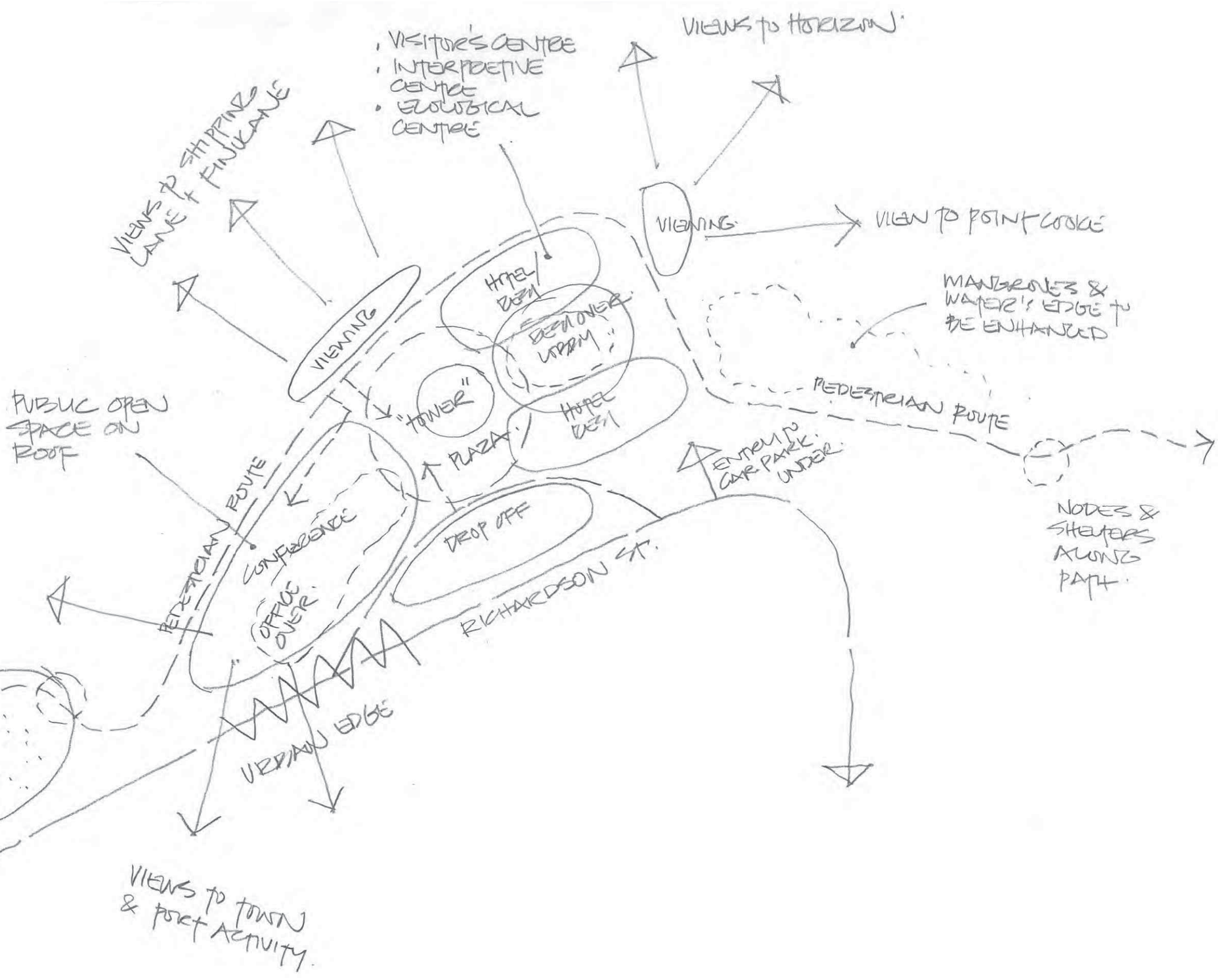

SITE DIAGRAM
scale 1:1000 @ A3

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PD1.8

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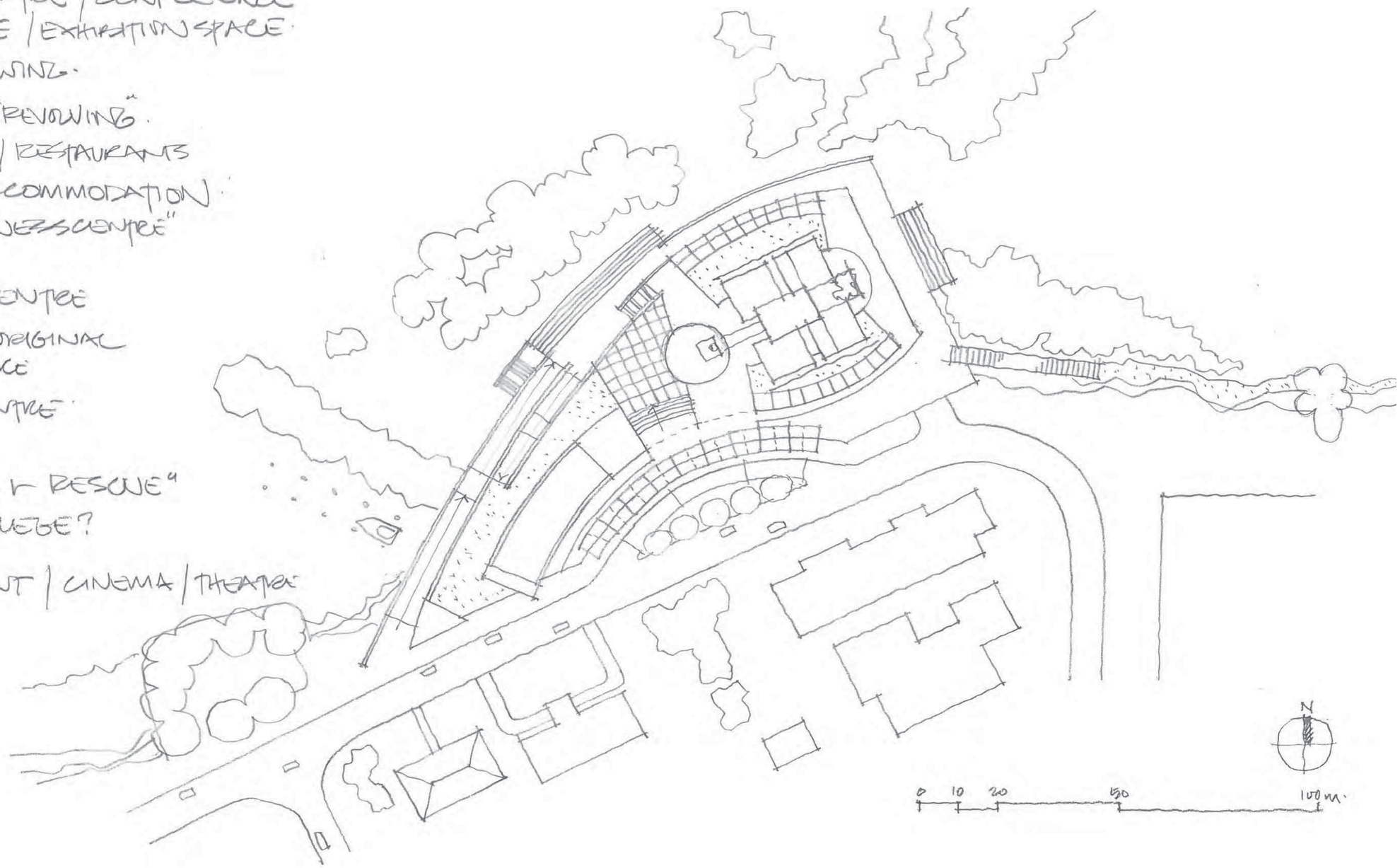
OPPORTUNITIES

- CONVENTION CENTRE / CONFERENCE
- VISITORS' CENTRE / EXHIBITION SPACE
- LOOK OUT + VIEWING
- RESTAURANT - "REVOLVING"
- RETAIL / CAFE's / RESTAURANTS
- SHORT STAY ACCOMMODATION
- OFFICE / "BUSINESSCENTRE"
- CAR PARK
- INTERPRETIVE CENTRE
- INDIGINOUS / ABORIGINAL HERITAGE CENTRE
- ECOLOGICAL CENTRE
- PROMENADE
- "SEA SEARCH + RESCUE"
- TERTIARY COLLEGE?
- HOTEL
- ENTERTAINMENT / CINEMA / THEATRE



AERIAL VIEW
scale 1:1000 @ A3

THE BEACON DEVELOPMENT **A vision for Port Hedland**
JULY 2011

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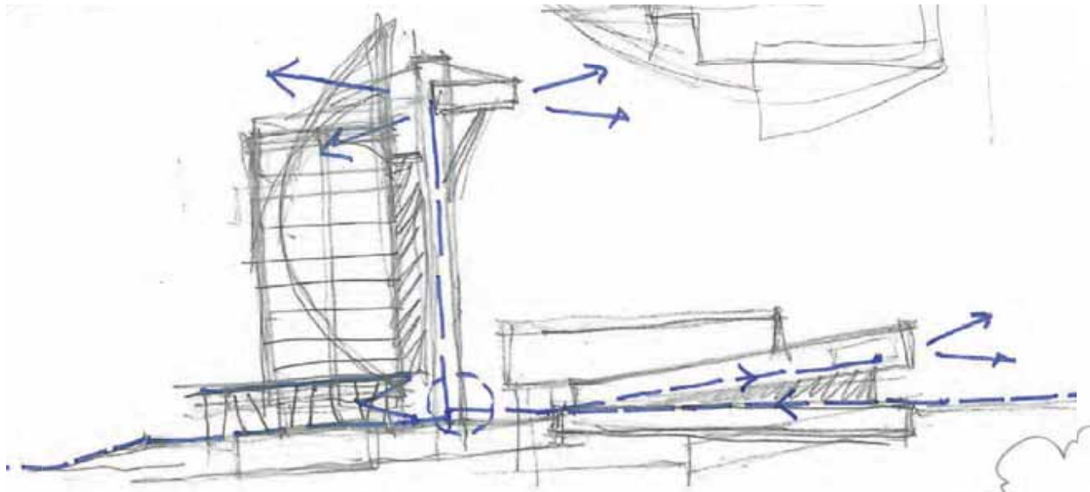

MOVEMENT PATTERNS
scale 1:1000 @ A3

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JULY 2011

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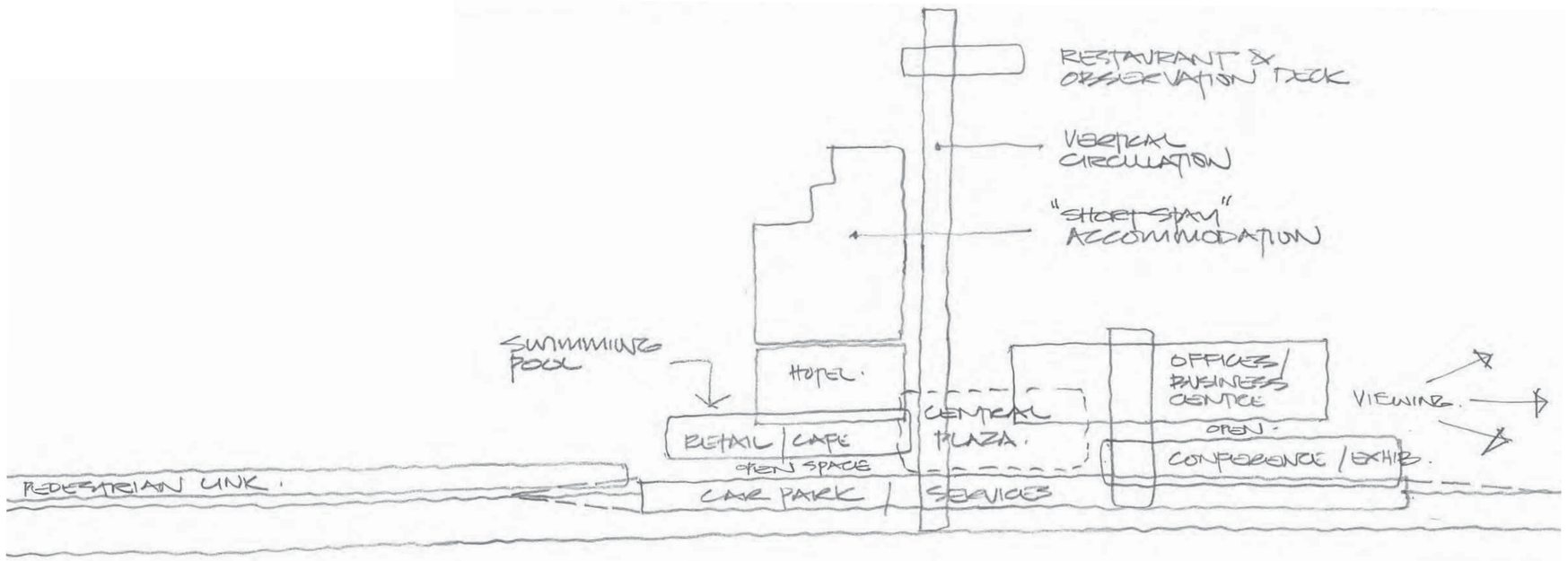

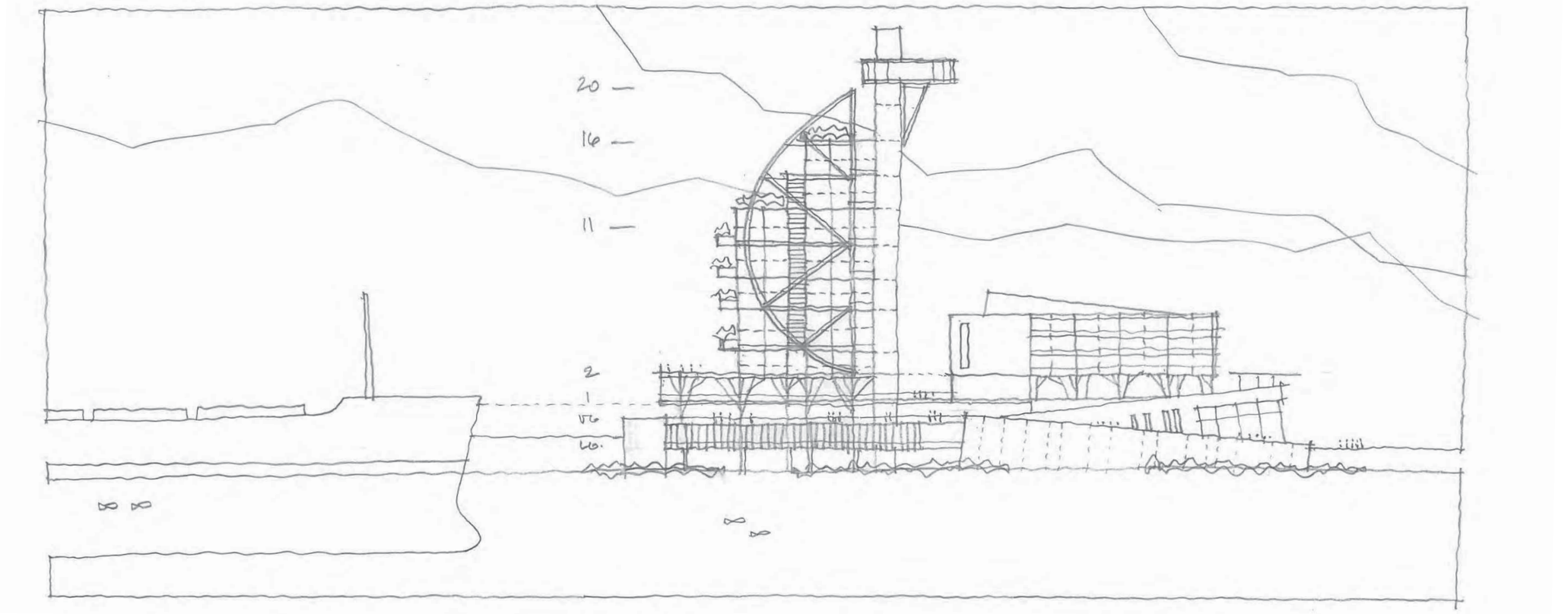

ELEVATION
scale 1:1000 @ A3

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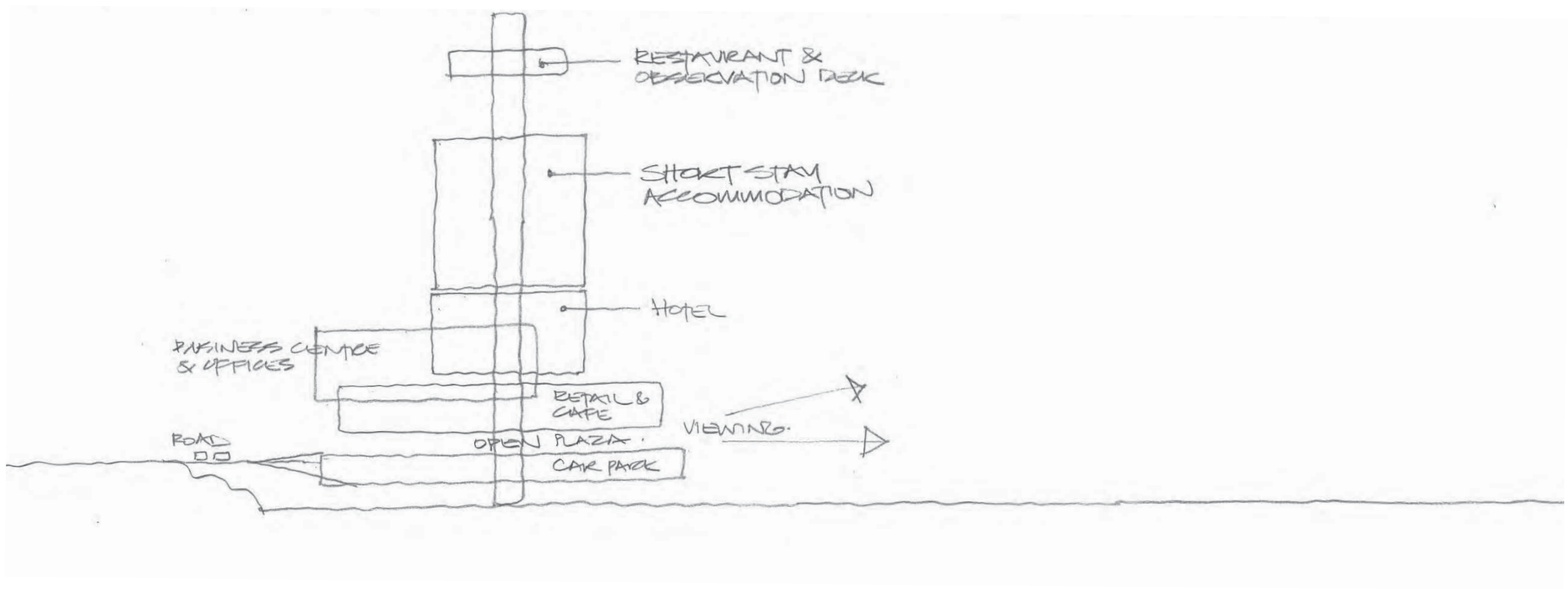

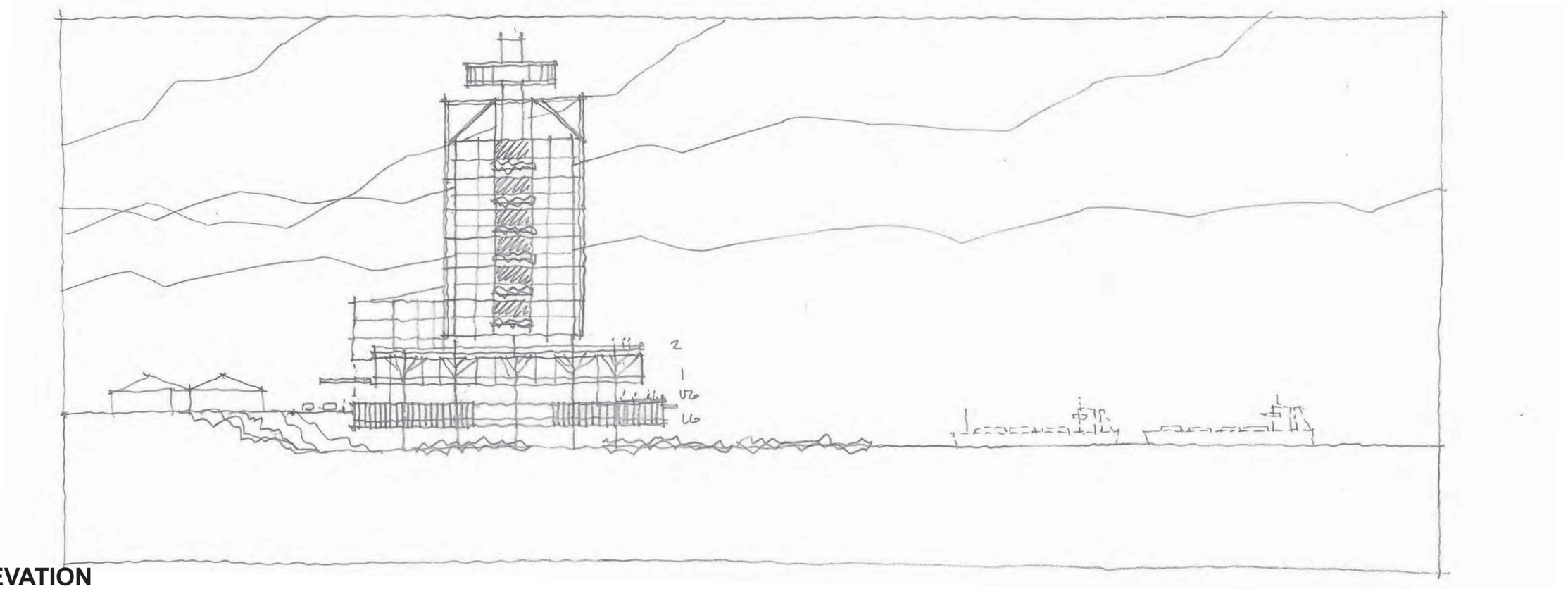

SIDE ELEVATION
scale 1:1000 @ A3

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JULY 2011

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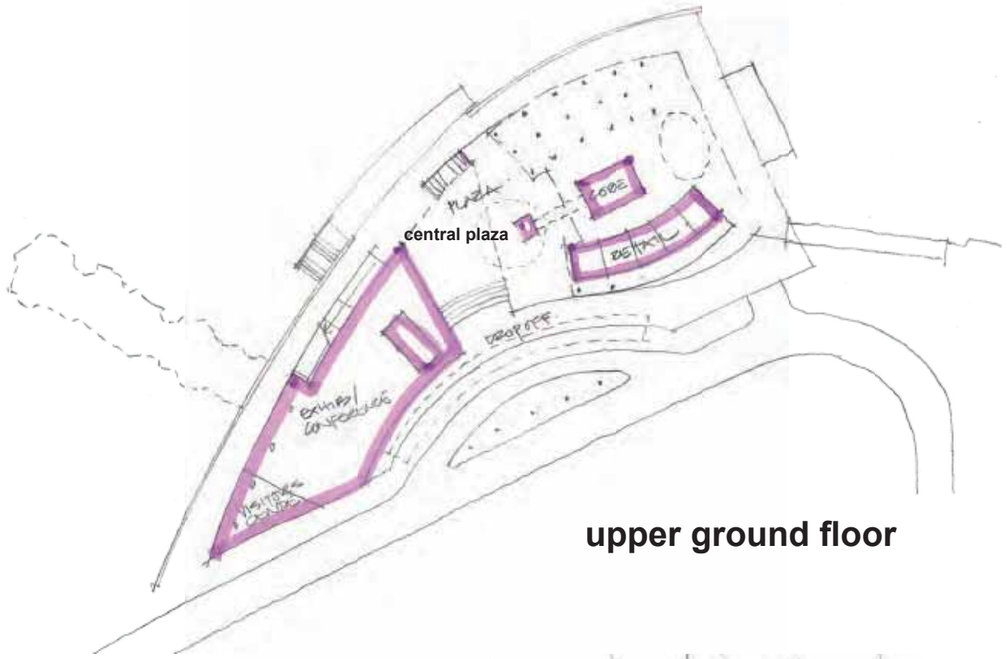
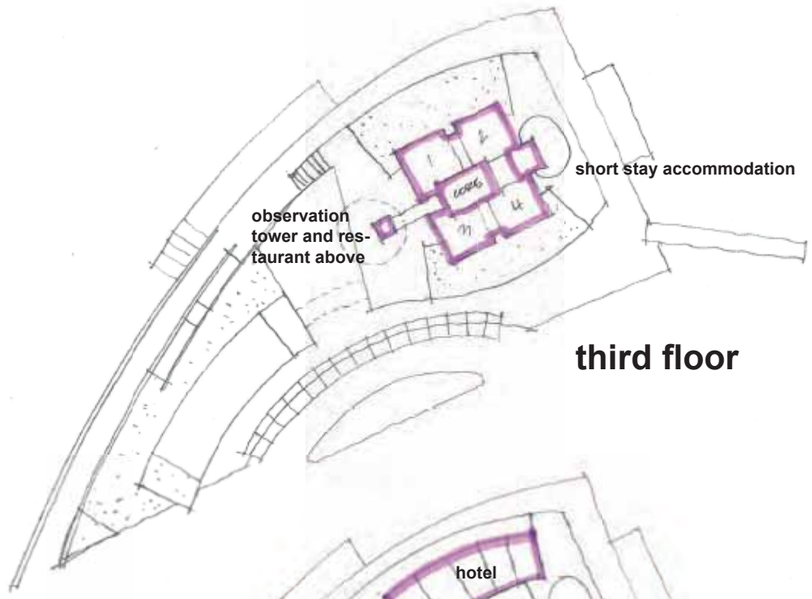
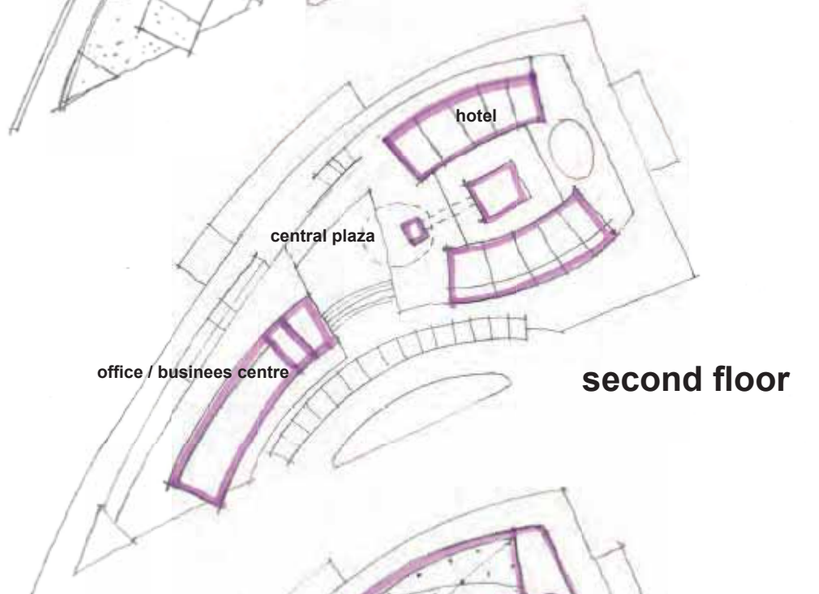


upper ground floor

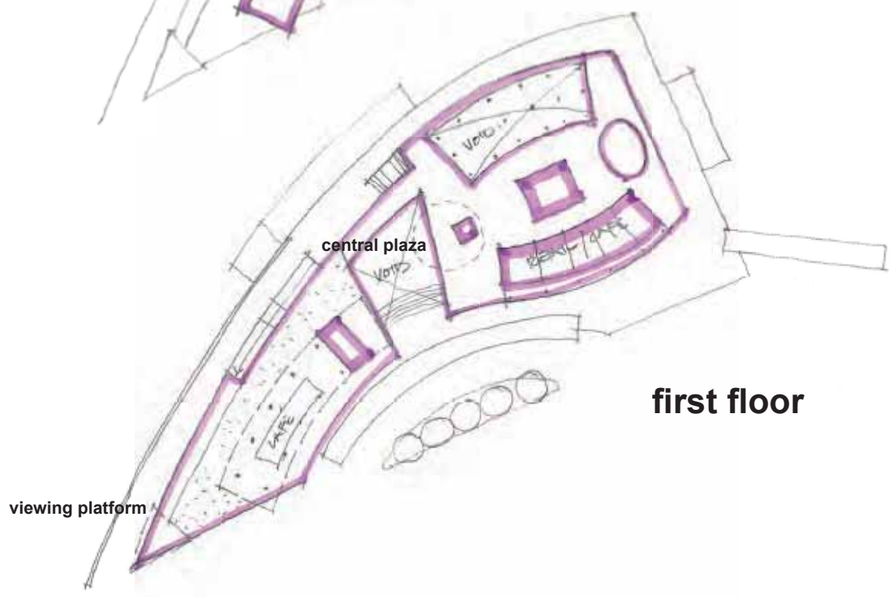
lower ground floor



third floor



second floor



first floor

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AERIAL VIEWS IN CONTEXT

THE BEACON DEVELOPMENT A vision for Port Hedland

JULY 2011

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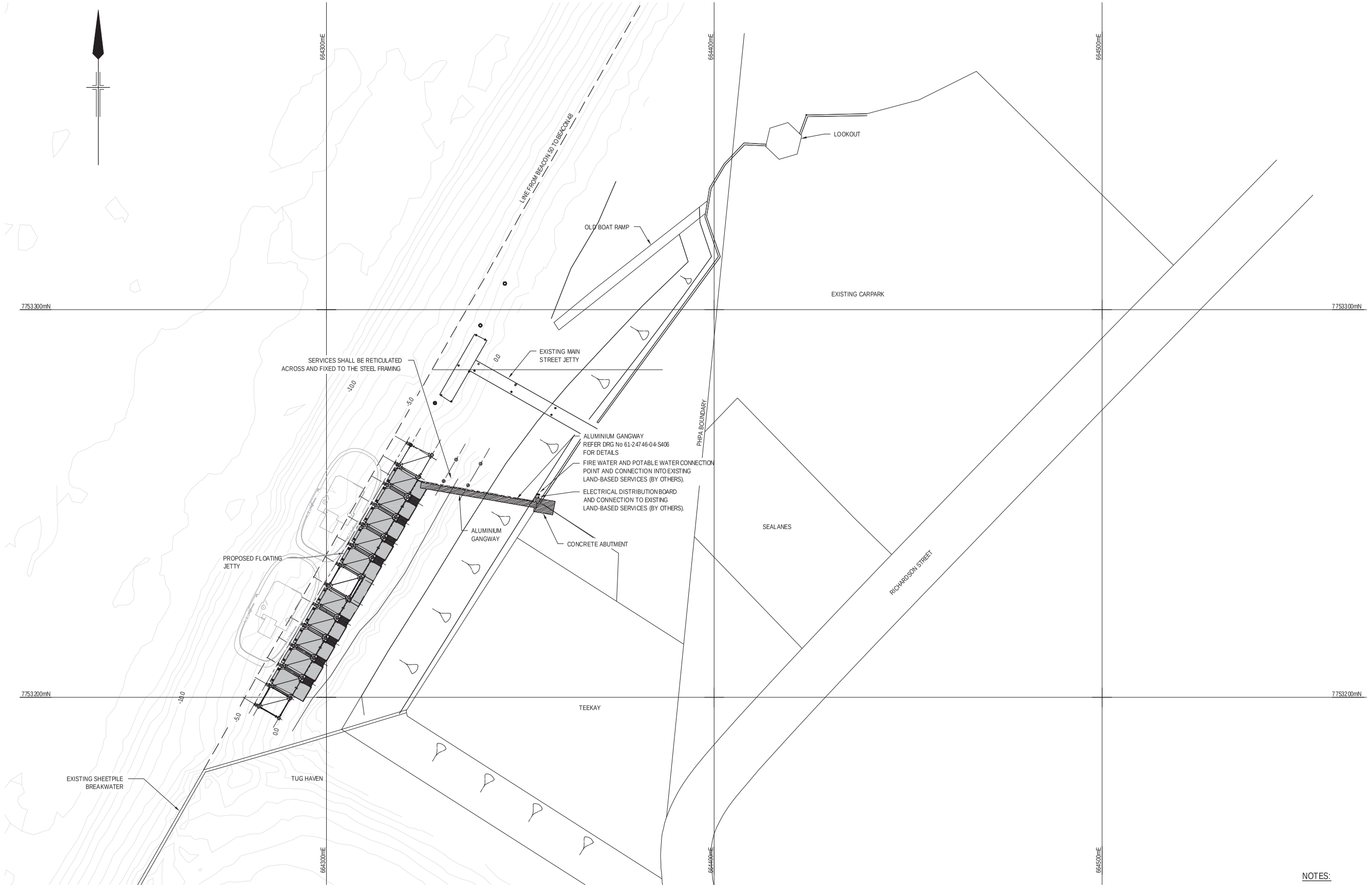


LOCATION PLAN

SCALE 1:500

NOTES:

1. REFER TO DRAWING NO. 61-24746-04-S400 FOR ALL NOTES.
2. REFER TO DRAWING NO. 61-24746-04-S410 FOR LOCATION OF EXISTING PILES WHICH WILL DEFINE SET-OUT OF NEW STRUCTURE.

No	Revision	Drawn	Job Manager	Project Director	Date
B	ISSUED FOR TENDER	SR	PR	BC	22.10.12
A	ISSUED FOR CLIENT REVIEW	SR	PR		

Note: * indicates signatures on original issue of drawing or last revision of drawing

0 5000 10000 15000 20000 25000mm

SCALE 1:500 AT ORIGINAL SIZE

GHD House, 239 Adelaide Tce Perth WA 6004
PO Box Y3106 Perth WA 6832 Australia
T 61 8 6222 8222 **F** 61 8 6222 8555
E permail@ghd.com.au **W** www.ghd.com

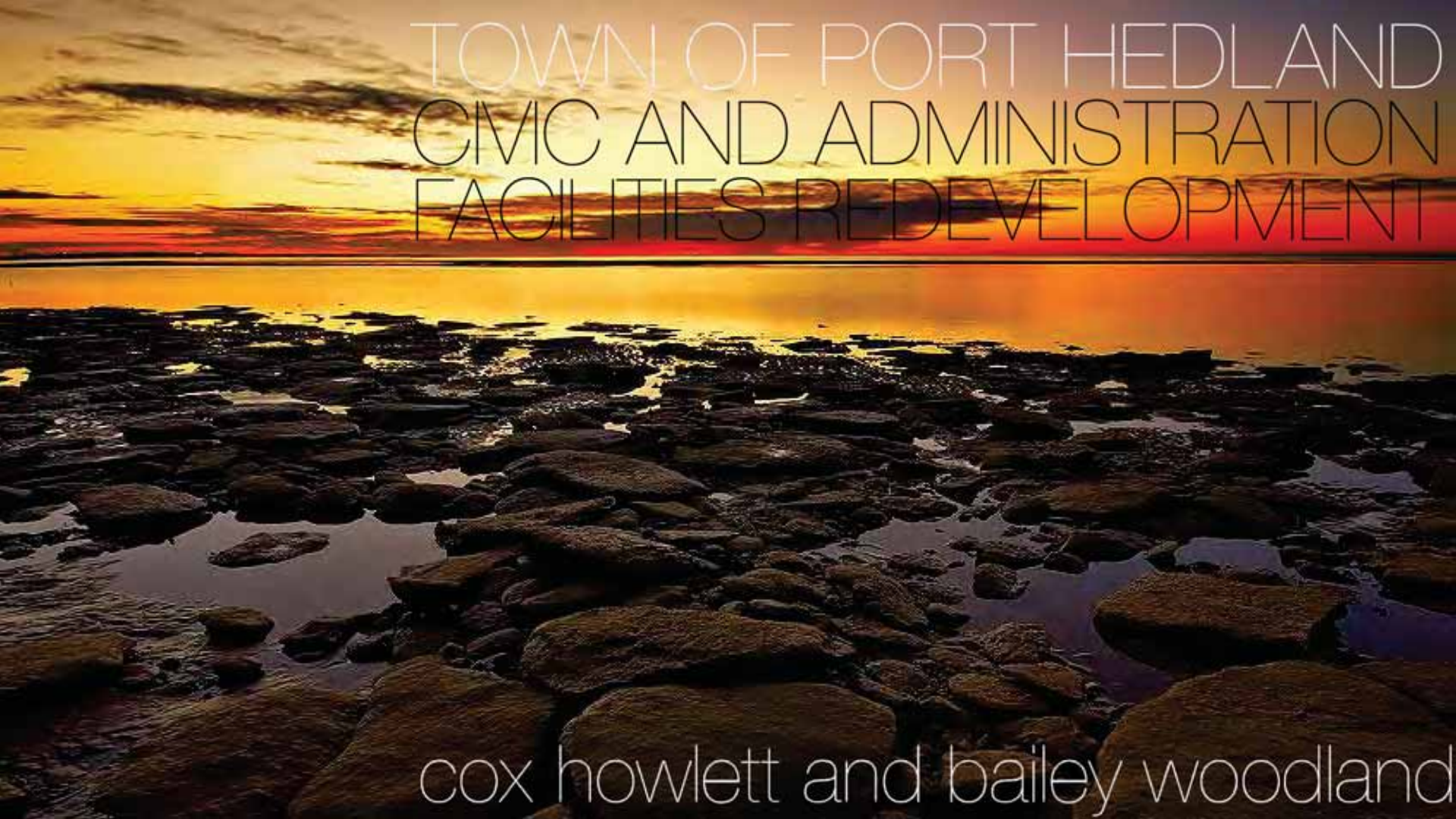
DO NOT SCALE

Drawn	S.ROYER	Designer	P.RALLABHANDI
Drafting Check	E.BARTOLOMEI	Design Check	C.CHALIKAWADA
Approved (Project Director)	B.CILLIERS		
Date	22.10.2012		
Scale	1:500	This Drawing must not be used for Construction unless signed as Approved	

Client PORT HEDLAND PORT AUTHORITY
Project MAIN STREET JETTY EXTENSION
Title STAGE 2A
LOCATION PLAN

Original Size A1 **Drawing No: 61-24746-04-S401** **Rev: B**

Plot Date: 23 October 2012 - 3:01 PM Plotted by: Sandra Royer Cad File No: G:\61\24746\Sub Jobs\04 - Main Street Jetty\Jetty Redesign May 2012\CADD\61-24746-04-S401.dwg


TOWN OF PORT HEDLAND
CIVIC AND ADMINISTRATION
FACILITIES REDEVELOPMENT
cox howlett and bailey woodland

BRIEF

VISION PLANNING BASED ON WORKFORCE PLAN 2012 – 2016 OUTCOMES

EXISTING SITE FOR ANALYSIS

ASPIRATIONAL OBJECTIVE FOR CLEAR, BOLD OUTCOMES

ACCOMMODATION CURRENCY:

WA DEVELOPMENT OF FINANCE WORKPLACE FIT-OUT STANDARDS – DRAFT JUNE 2012

15m² /person of NLA

ACCOMMODATION

ACCOMMODATION

Total FTE	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016
Office of CEO		4	34	39	41
Mayor		1	1	1	1
Corporate Services		42	29	33	33
Engineering Services		5	5	19+ 4 hot desks	19+ 4 hot desks
Planning and Development		33	40	54	58
Community Development	13+ 2 hot desks	21 + 2 hot desks	27+ 2 hot desks	32 + 3 hot desks	40 + 4 hot desks
TOTALS		108	138	185	200

CONTEMPORARY WORKPLACE

OFFICE

OFFICE

OPEN PLAN

MEETING

MEETING

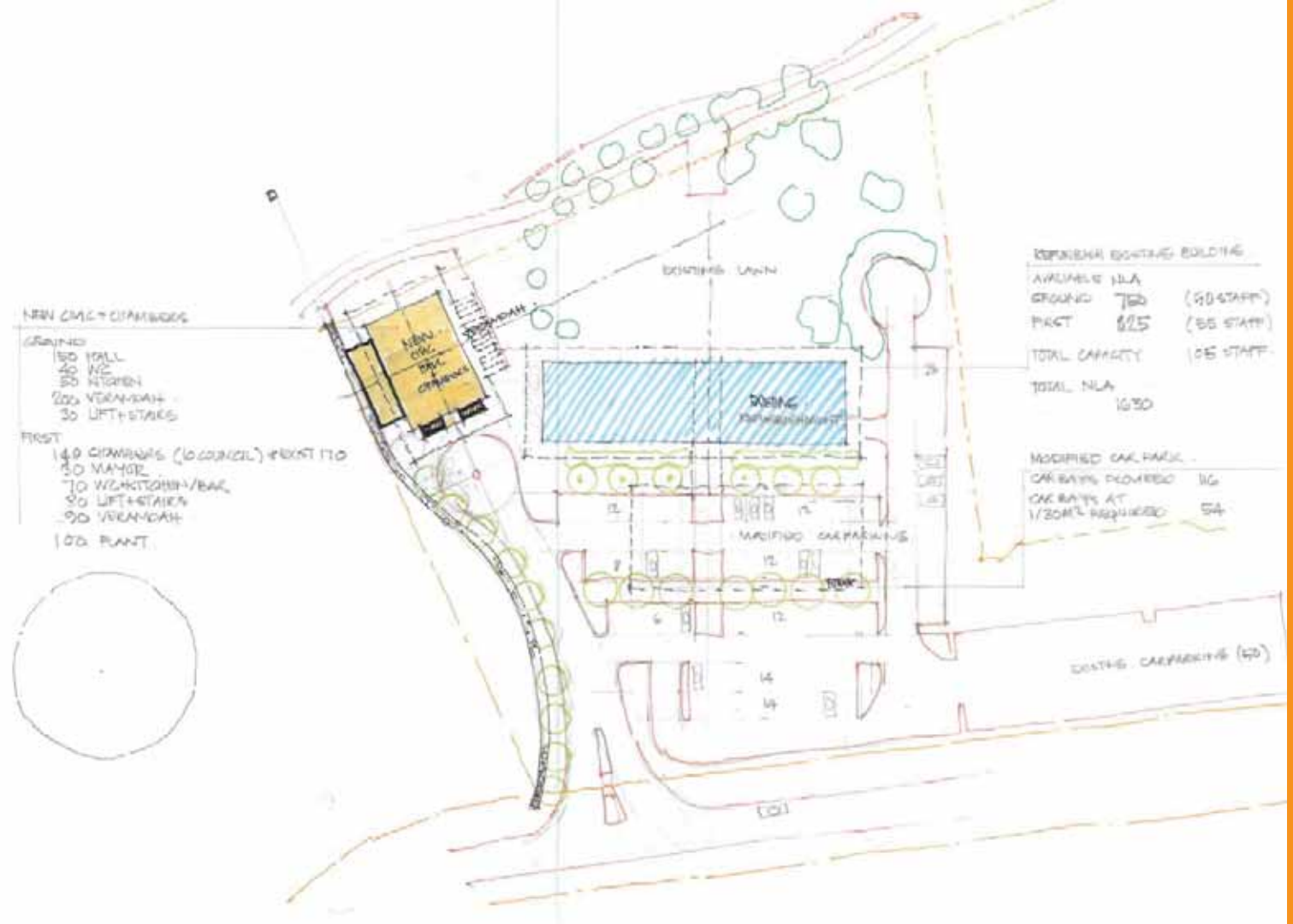
CAFE/HUB

CAFE/HUB

QUIET SPACES

VISION PLANS

SCENARIO 1

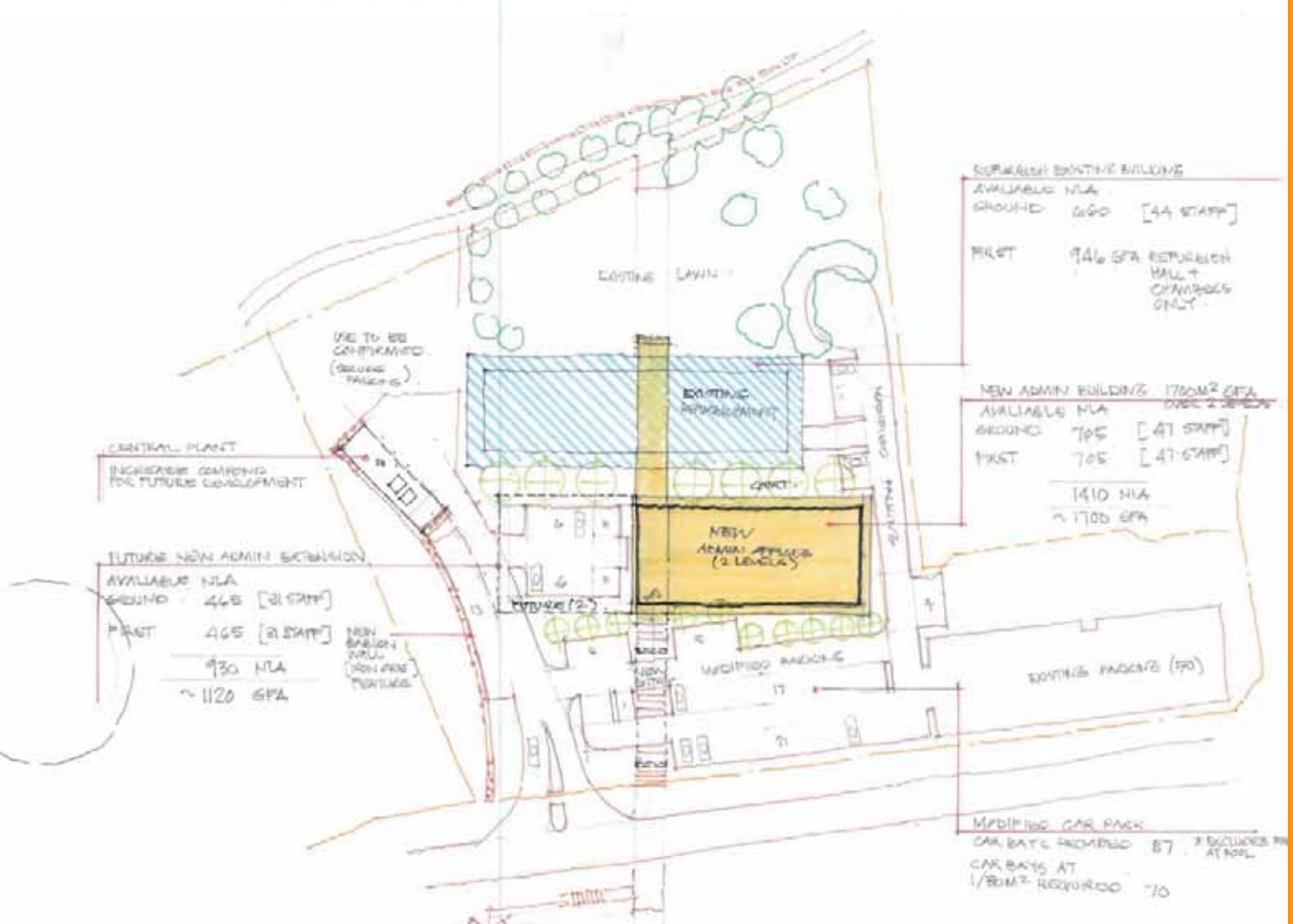


New Council Chambers and Community Hall 900m²

Full refurbishment of existing administration building

Staff Capacity 105

Approximately
$18M +GST
Oct 2015



SCENARIO 2 A

Refurbish existing hall and chambers at FF

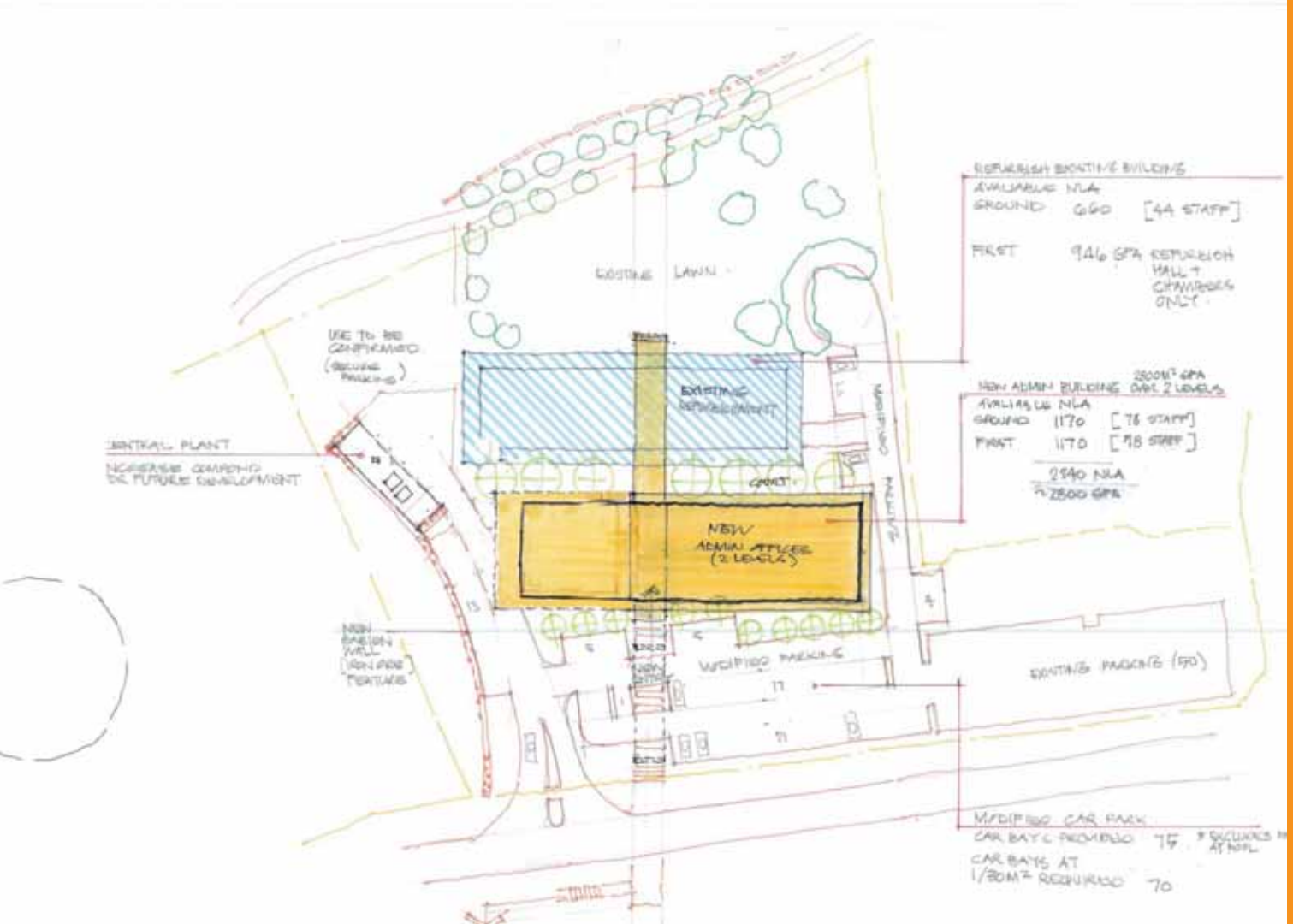
Refurbish existing administration building GF [44 staff]

New 2 storey building GF + FF [94 staff]

Future extension GF + FF [62 staff]

Staff Capacity 138

Approximately $23M +GST Jan 2016



SCENARIO 2 B

Refurbish existing hall and chambers at FF

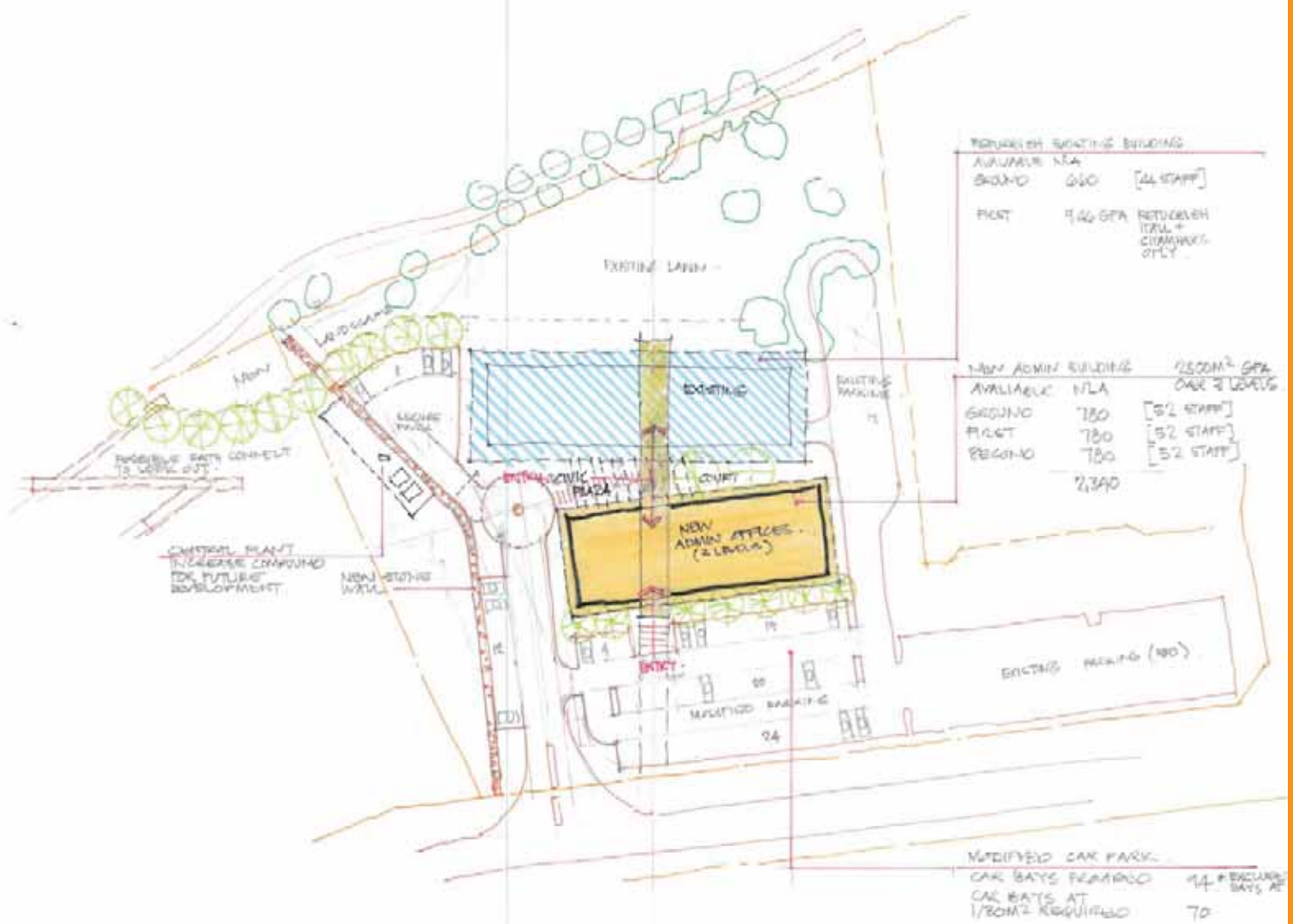
Refurbish existing administration building GF [44 staff]

New 2 storey building GF + FF [156 staff]

Staff Capacity 200

Approximately
$29.5M +GST
Mar 2016

SCENARIO 3



Refurbish existing hall and chambers at FF

Refurbish existing administration building GF [44 staff]

New 3 storey building GF + FF + SF [156 staff]

Staff Capacity 200

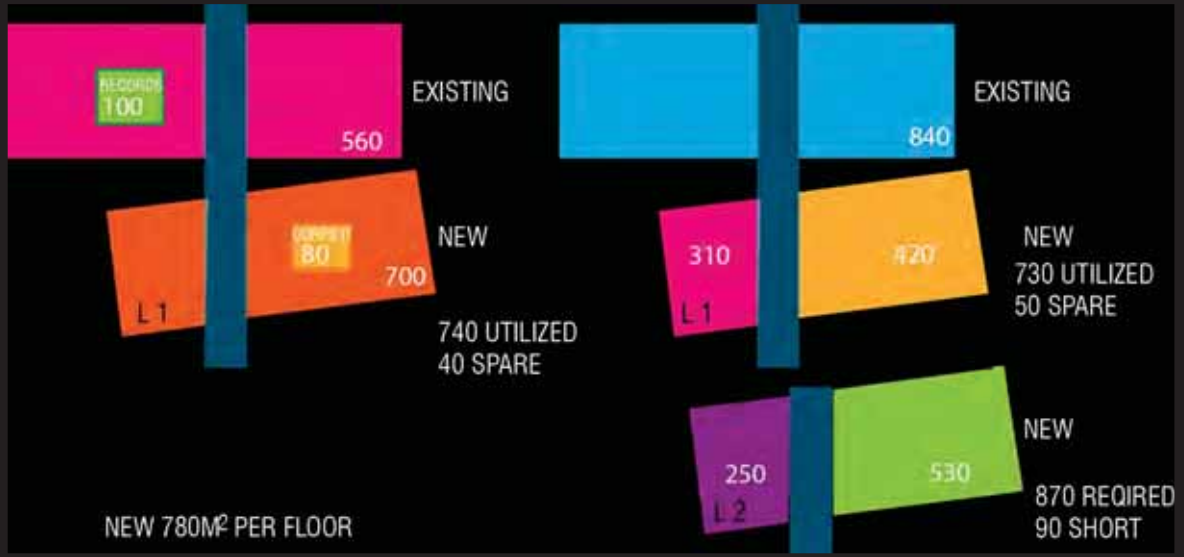
Approximately
$30.5M +GST
Jul 2016

ACCOMMODATION MAPPING

SCENARIO 2 B

- community
- engineering
- planning
- civic + chambers
- corporate services
- CEO + mayor

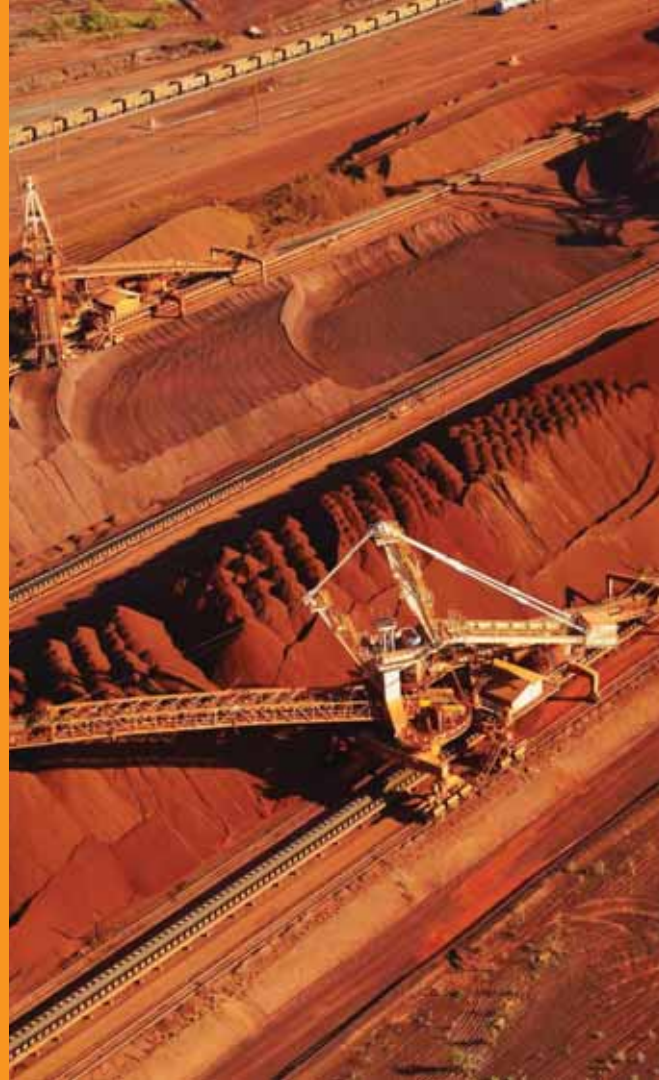
SCENARIO 3



- community
- engineering
- planning
- civic + chambers
- corporate services
- CEO + mayor

LANDSCAPE
PLACEMAKING

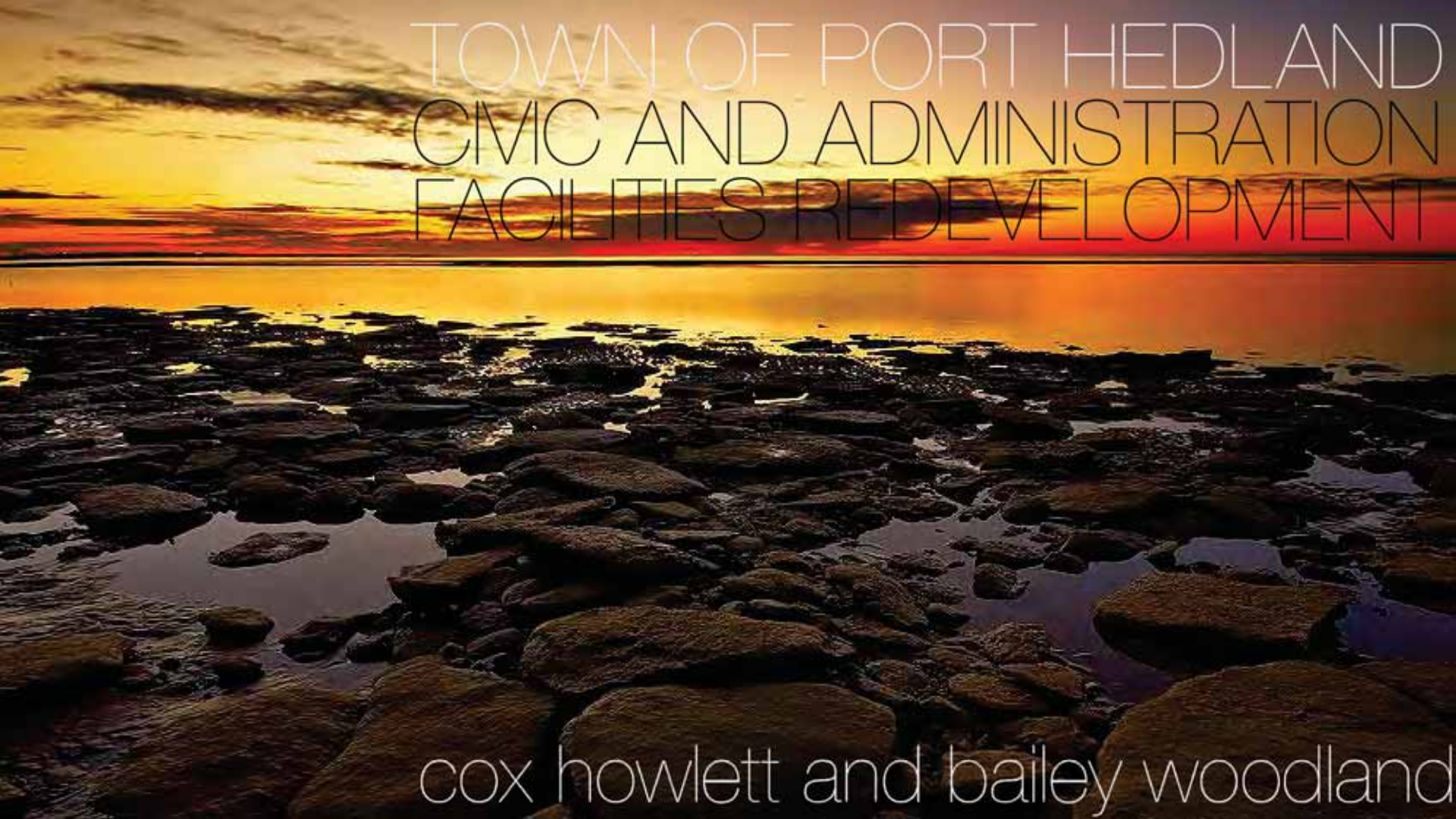

BHP Iron

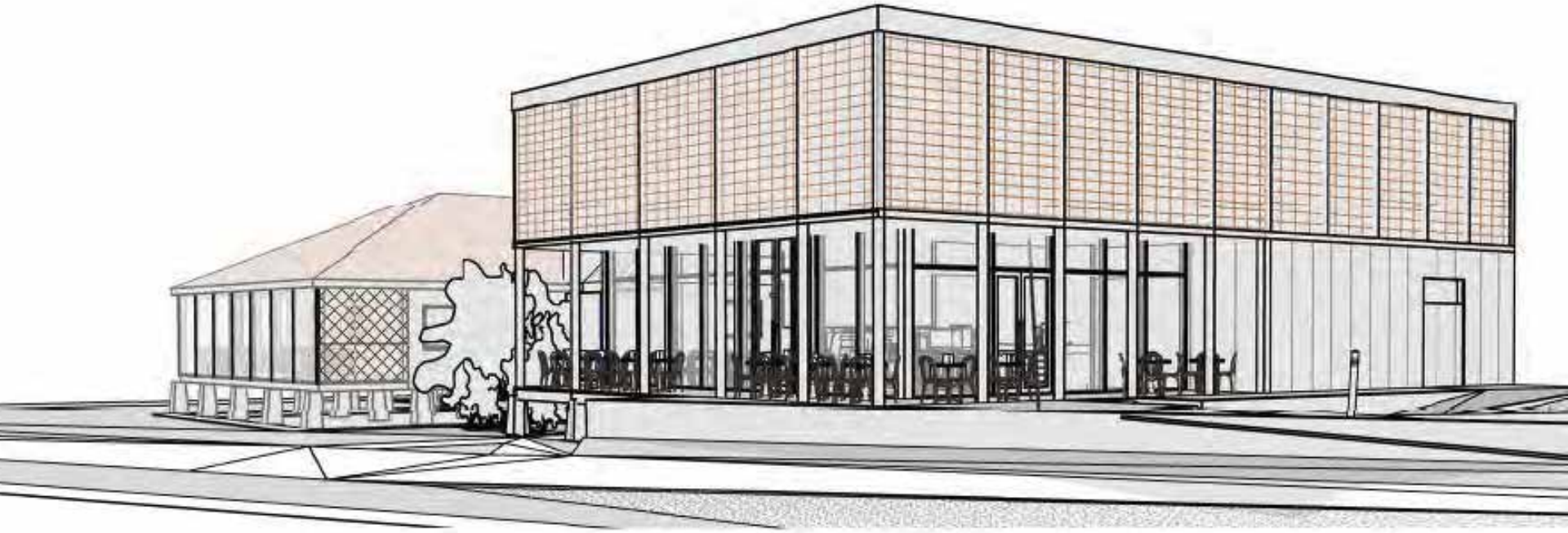


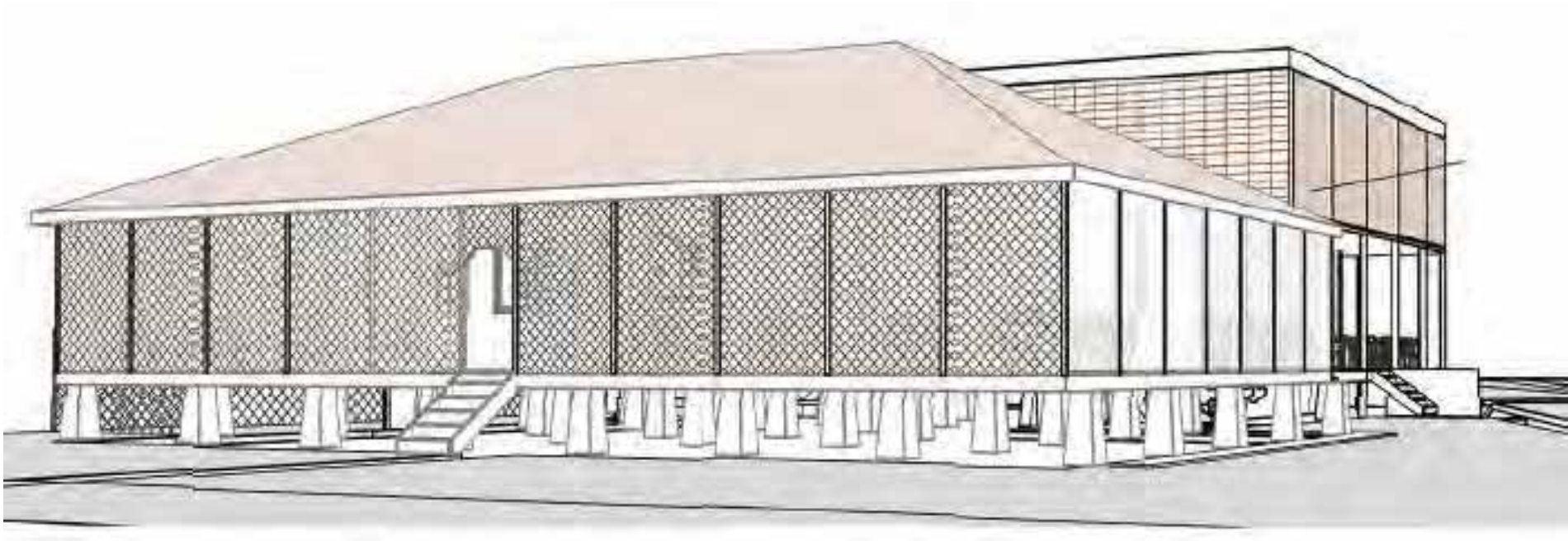
DESIGN STUDIES


SCENARIO 2
B

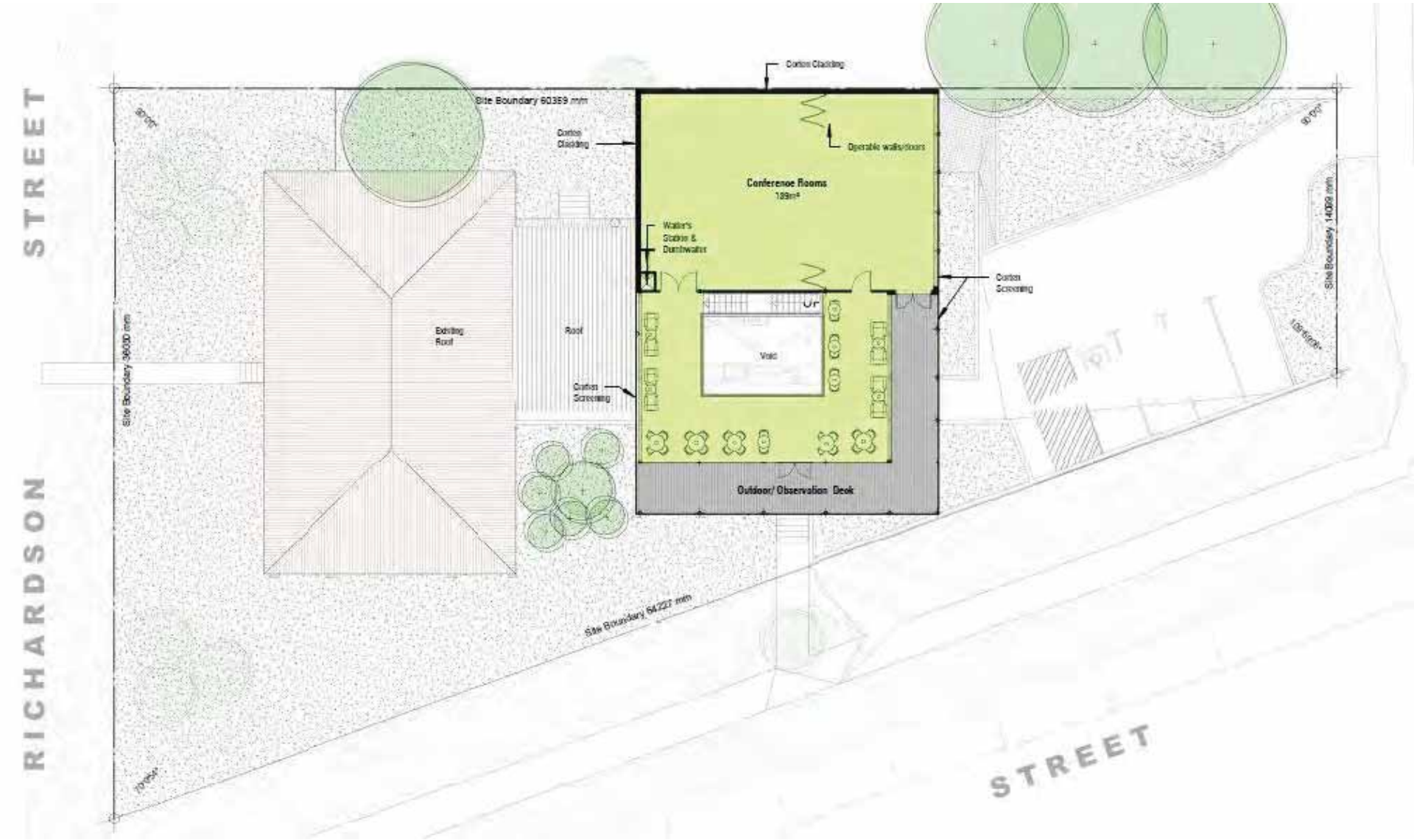

SCENARIO 3
PORT HEDLAND

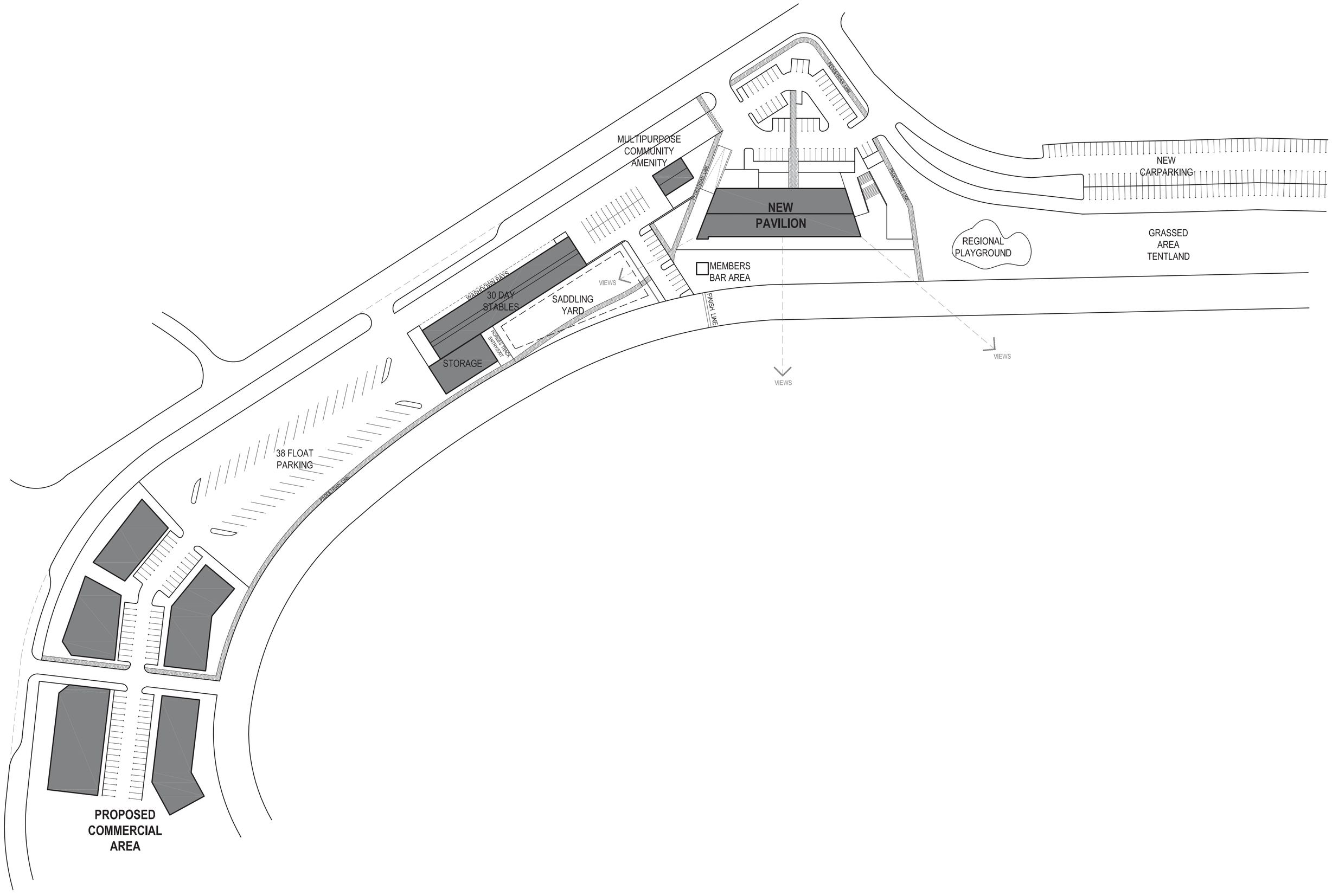

TOWN OF PORT HEDLAND
CIVIC AND ADMINISTRATION
FACILITIES REDEVELOPMENT
cox howlett and bailey woodland






12111
Existing Building
6000
New 'Glass Box'
15000
New Extension
Fencing
Site Boundary 60359 mm
Retaining Wall
Dry Store
Clnr
Staff
Bin Area
Plant
R.L. 6.96
F.F.L 7.46
Service / Deliveries
Security gate
Secured Play Area
Kitchen
Freezer
Cool Room
F
Dis. WC
M
Air-lock
Dumbwaiter
Store
UP
Lounge
Serving Counter
LOT 76
1,513m²
Existing Footpath
Existing Verandah
F.F.L 7.46
R.L. 7.46
Office
Screen Planting
Site Boundary 56227 mm
Line of existing crossover shown dotted
10 Parallel Bays
STREET


RICHARDSON STREET
Site Boundary 60389 mm
Corten Cladding
Corten Cladding
Operable walls/doors
Conference Rooms
189m²
Water's Stable & Dumbwaiter
Corten Screening
Existing Roof
Roof
Void
Corten Screening
Outdoor/ Observation Deck
Site Boundary 36000 mm
Site Boundary 14000 mm
Site Boundary 64227 mm
STREET



SK 01 PORT HEDLAND TURF CLUB - PRELIMINARY DESIGN STUDY
SITE PLAN

MAY 2013 SCALE 1:1000 @ A1
JOB NO. 1210

N

0 1 2 5 10
Scale of metres

Bollig Design Group
Architecture
Urban Design
Master Planning
Interior Design
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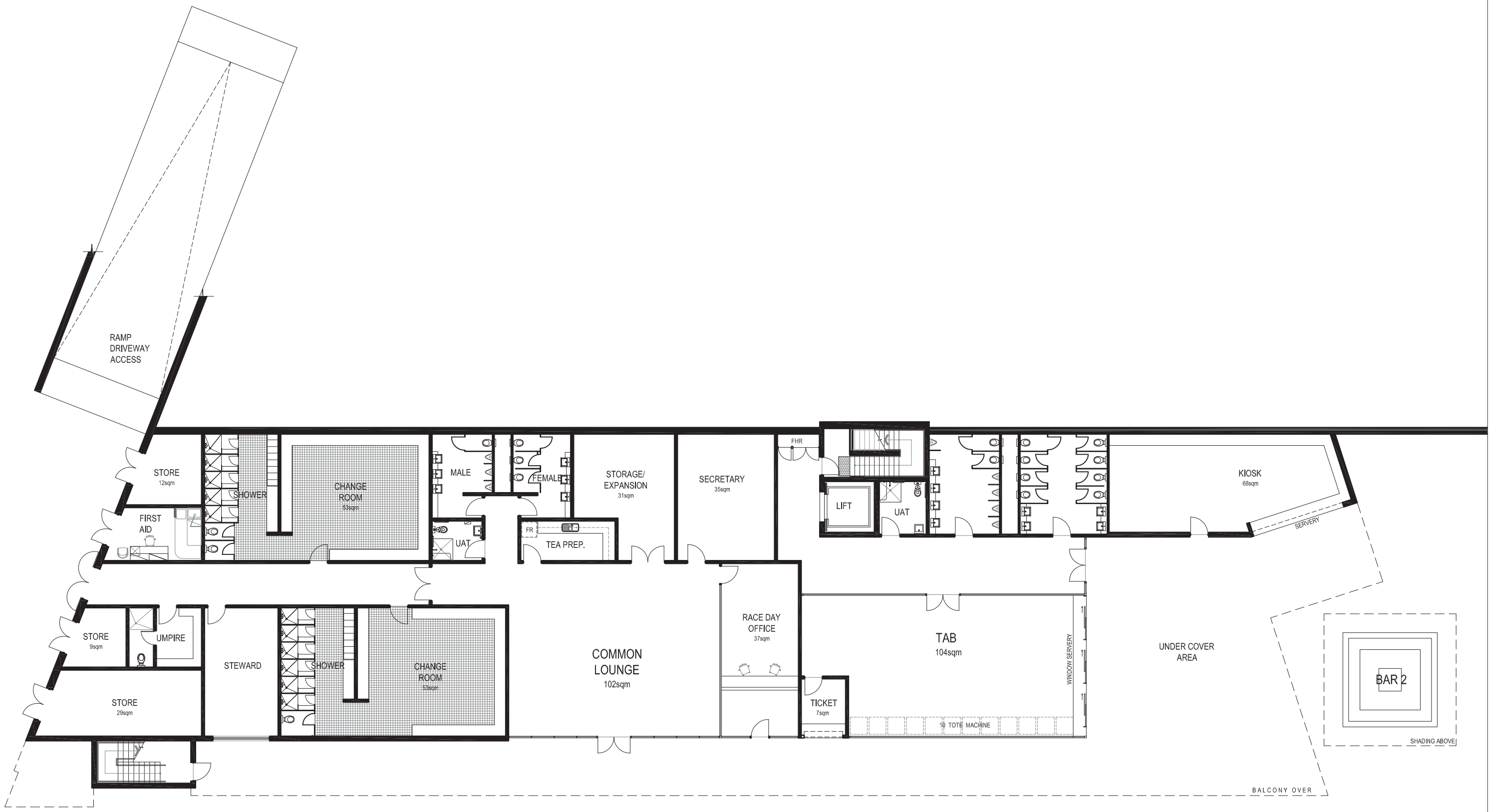
T. 61 8 9321 4402 F. 61 8 9481 8259
E. bdg@bollig.com.au W. bollig.com.au
ABN 62 968 268 623



SK 02 PORT HEDLAND TURF CLUB - PRELIMINARY DESIGN STUDY
LOWER GROUND FLOOR PLAN

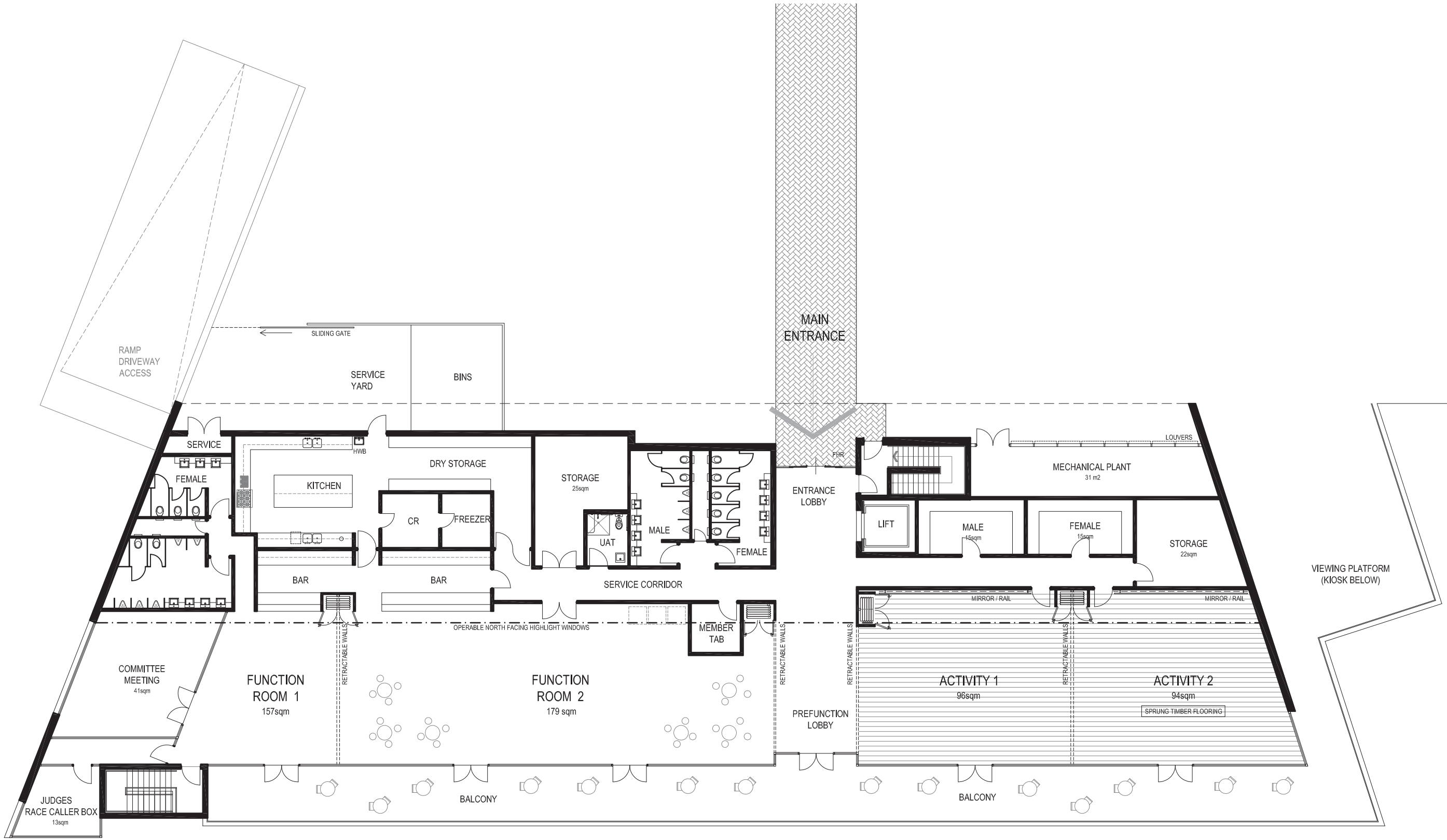
MAY 2013 SCALE 1:200 @ A3

JOB NO. 1210

N

0 1 2 5 10
Scale of metres

Bollig Design Group
Architecture
Urban Design
Master Planning
Interior Design
T. 61 8 9321 4402 F. 61 8 9481 8259
8 Cook Street, E. bdg@bollig.com.au W. bollig.com.au
West Perth WA 6005
ABN 62 968 268 623



SK 03 PORT HEDLAND TURF CLUB - PRELIMINARY DESIGN STUDY
UPPER GROUND FLOOR PLAN

MAY 2013 SCALE 1:200 @ A3

JOB NO. 1210

N

0 1 2 5 10

Scale of metres

bdg Bollig Design Group
Architecture
Urban Design
Master Planning
Interior Design
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West Perth WA 6005
T. 61 8 9321 4402 F. 61 8 9481 8259
ABN 62 968 268 623

1 Mpark Artspace

- Build over existing carpark
- Cafe / Restaurant
- Exhibition Space
- Function Rooms
- Offices
- Artist in residence with accom

2 Wedge Street

- Upgrade landscape for street activities
- Connect to Courthouse Gallery

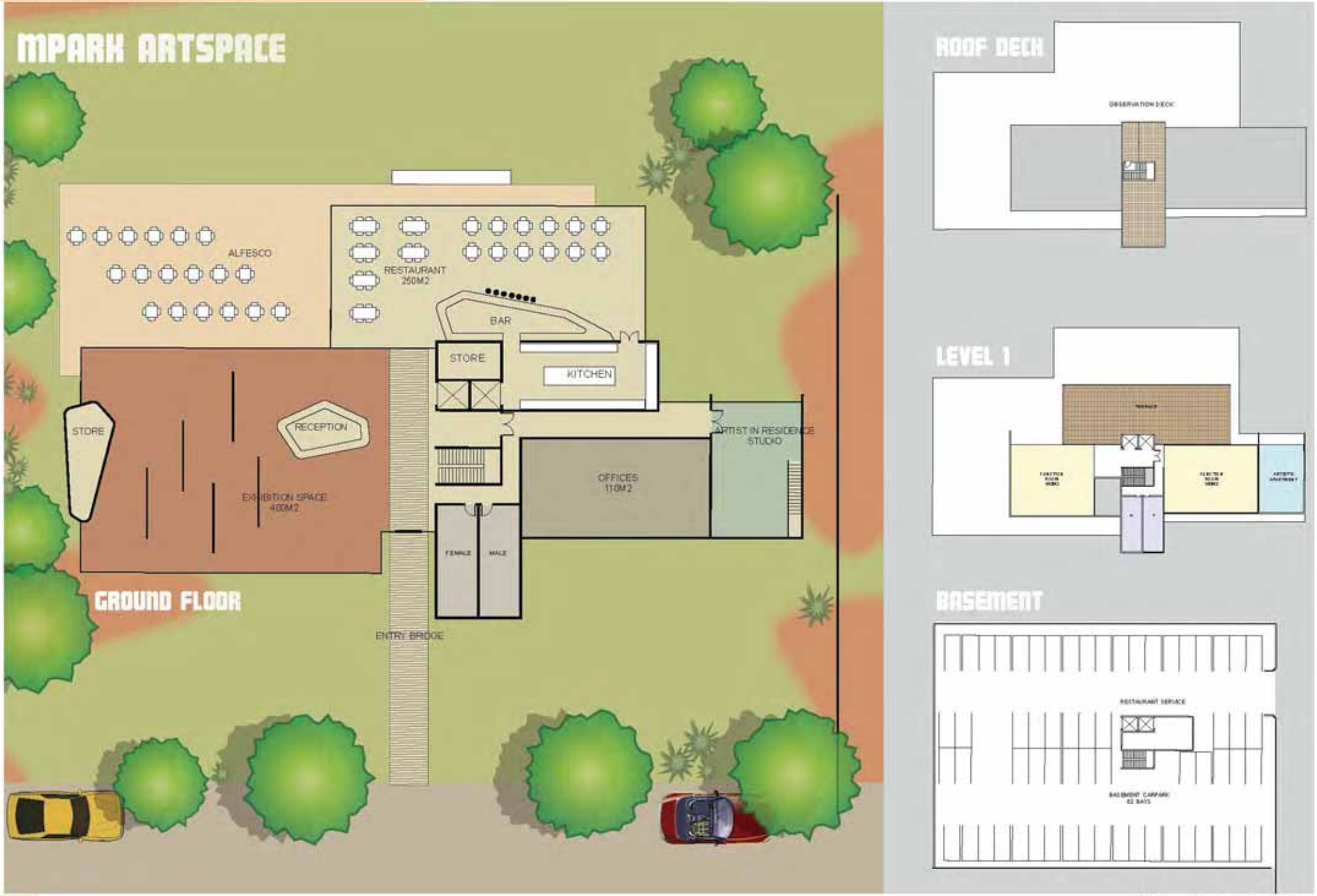
3 Coastal boardwalk

- Waterfront Uses
- Activate beach front
- Mangrove Interpretation
- Sculpture
- Link to Yacht Club

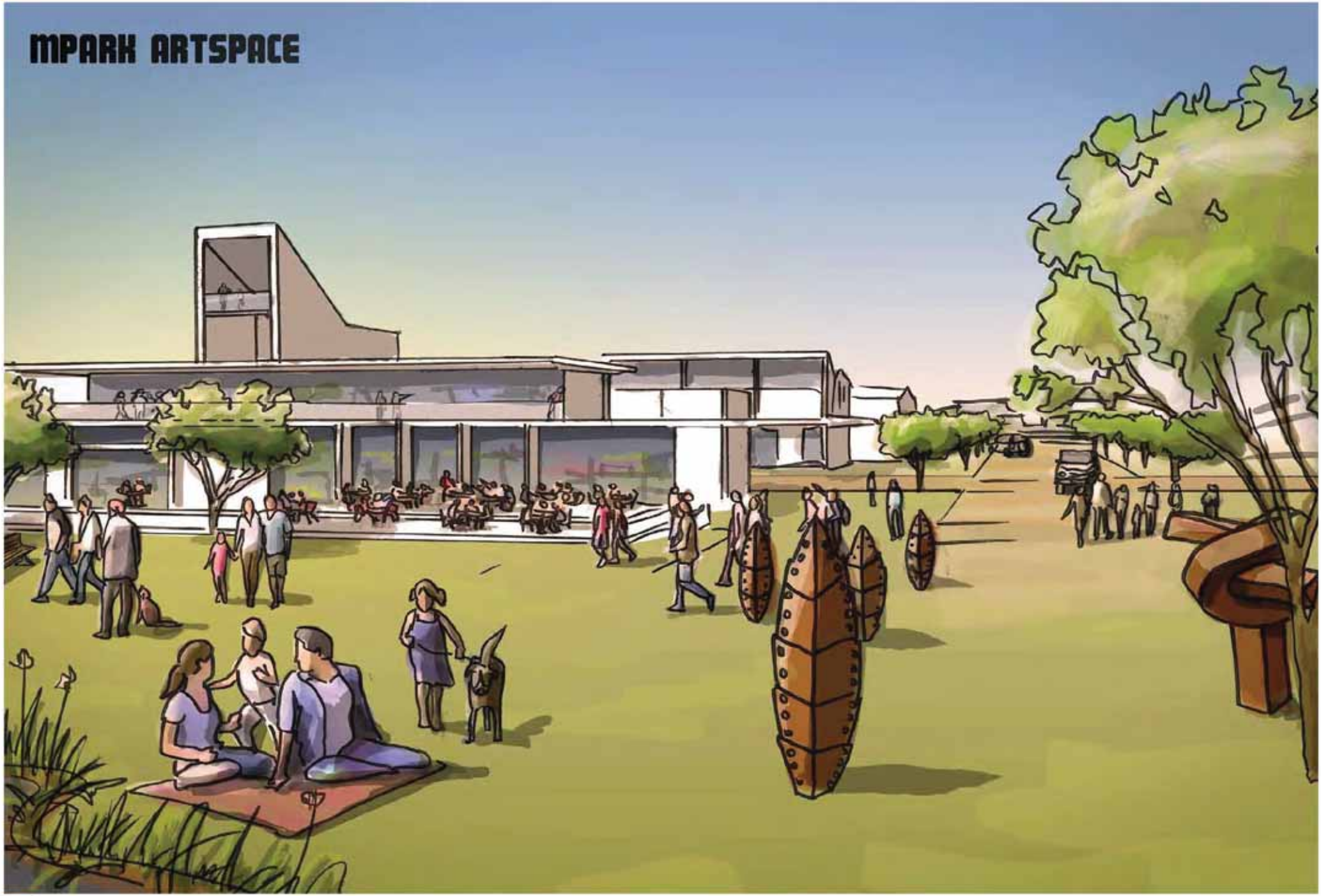
4 Dedicated Event Space

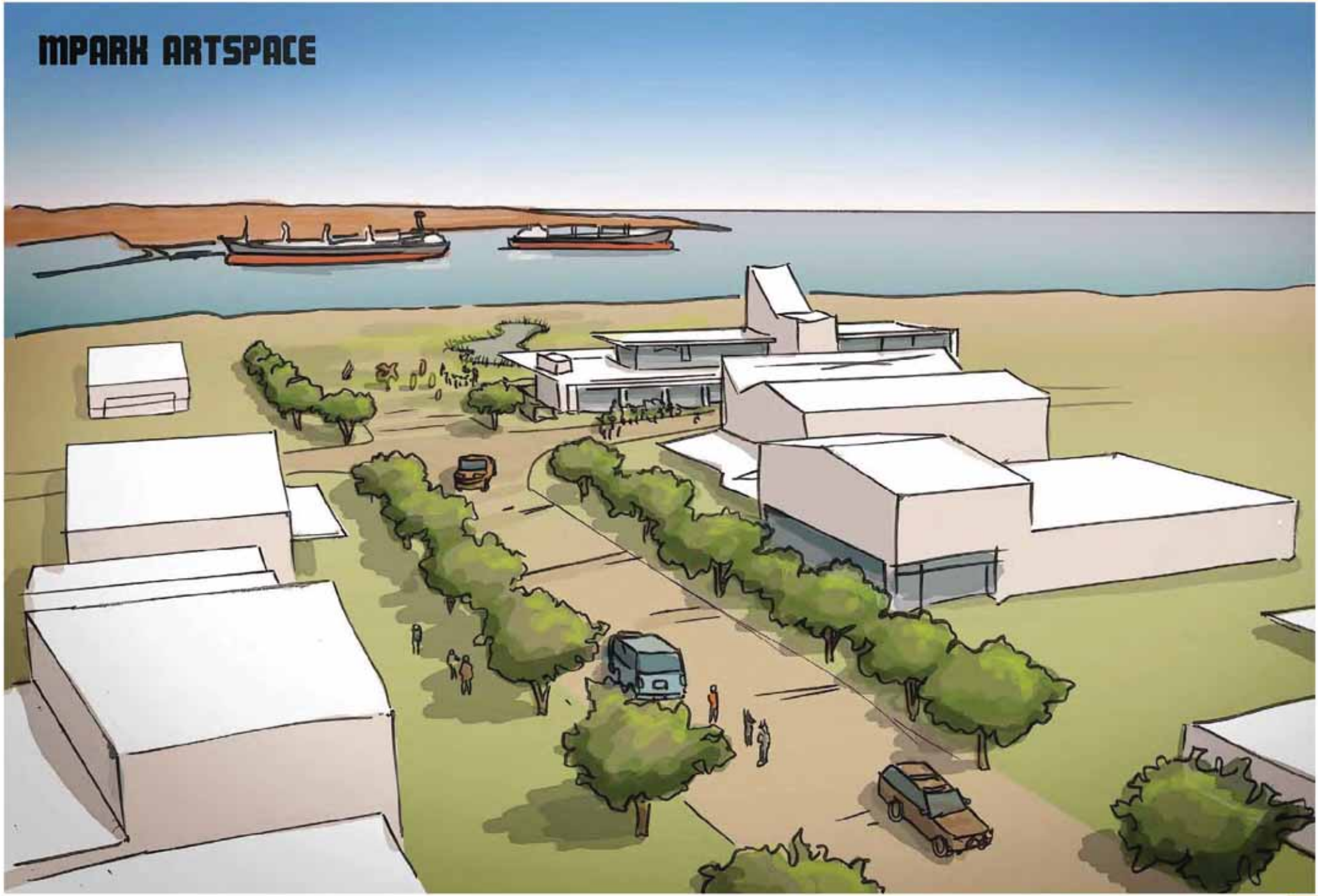
- Park suitable for passive recreation
- Circus
- Earth Amphitheatre
- Permanent ablutions / Cafe
- Dedicated event space for up to 8,000

Figure 23: Art Space Conceptual Floorplan

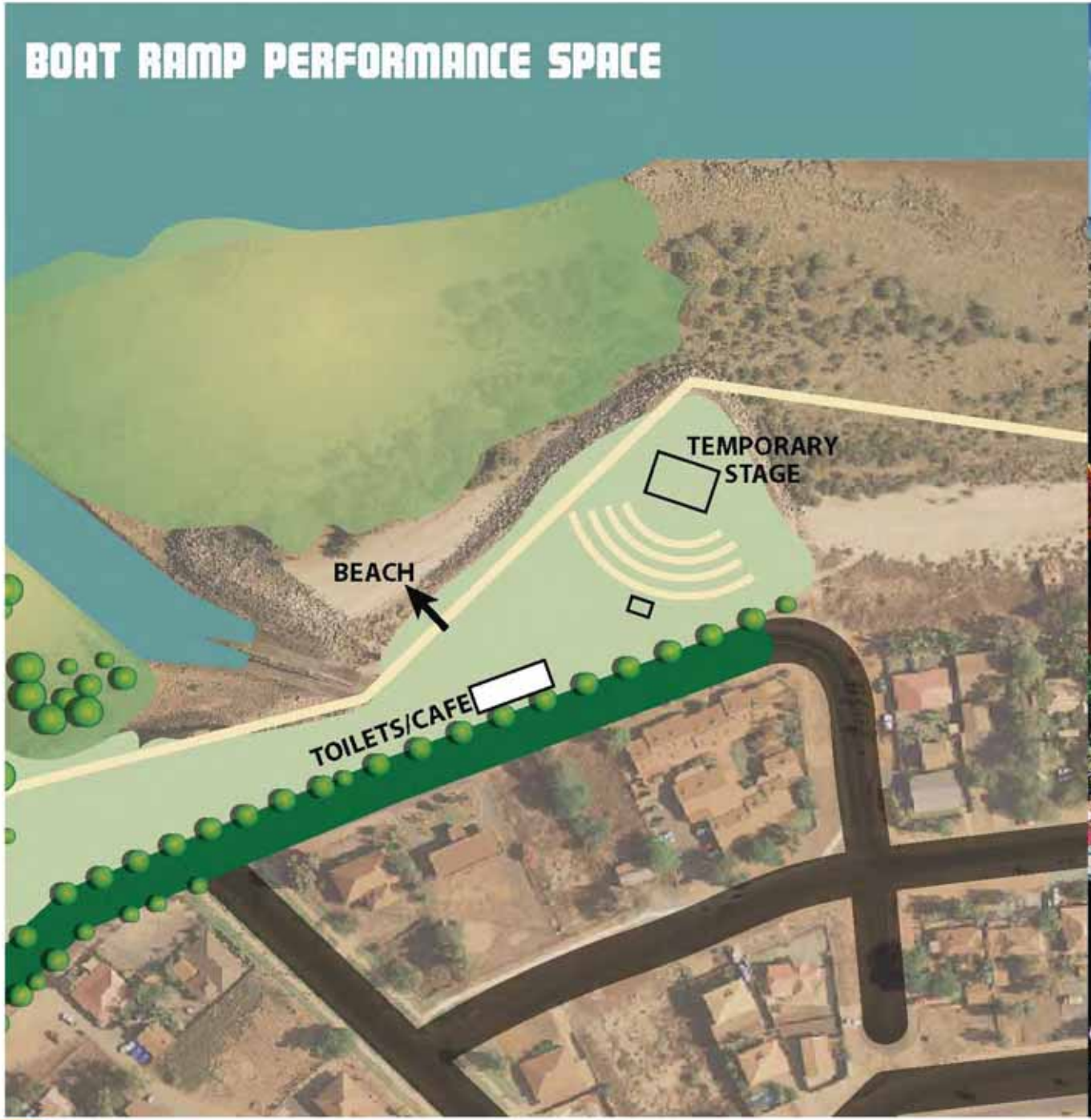


Source: Peter Hobbs Architect


MPARK ARTSPACE


MPARK ARTSPACE

BOAT RAMP PERFORMANCE SPACE




MARINA
LANDCORP
RPS

WEST END COMMERCIAL + CULTURAL PRECINCT
PORT HEDLAND

PROSPECTUS

SEPTEMBER 2011

form.

HASSELL

OVERVIEW

"Even more significant than its capacity to improve quality of life for all Pilbara residents, arts and cultural infrastructure is an essential ingredient for economic development opportunities outside of the resource sector."

To support this objective, as outlined in The Pilbara Plan (Pilbara Area Consultative Committee, 2008) FORM, in a proposed partnership with BHP Billiton Iron Ore and the Town of Port Hedland aims to develop a world-class commercial and cultural precinct in Port Hedland's West End district.

The West End Commercial and Cultural Precinct development poses a unique opportunity for Port Hedland to establish a vibrant, attractive and stimulating concentration of business, hospitality and cultural activity in the heart of the West End; a dynamic working and leisure environment which celebrates the unique vernacular of the Pilbara through iconic architectural design.

The focus of the precinct will be to provide much needed A-class gallery facilities to showcase the best of the region's Aboriginal art and contemporary photography, with a vision of attracting international audiences and talent to the Pilbara. Aboriginal art in particular provides Australia with significant international recognition and figures highly in the nation's identity, as well as providing an opportunity for Aboriginal people to engage with the mainstream economy in a way that is culturally relevant and sustainable.

To complement the gallery the precinct will also include a conference facility with capacity for 200 people, two working studios for professionals or specialists-in-residence, a retail space, restaurant and bar, and a 2100sqm four-storey commercial building.

OBJECTIVES

Through the development of the West End Commercial and Cultural Precinct, BHP Billiton Iron Ore, the Town of Port Hedland and FORM hope to achieve the following objectives:

1. Provide a more resilient and well rounded economic environment by developing new infrastructure, services and public spaces which support cultural, social and commercial development and exchange;
2. Attract the talent needed to support the growing operations of the resource sector, particularly the highly skilled, global workforce;
3. Deliver an iconic destination that supports the growth of cultural tourism in Port Hedland;
4. Encourage greater social interaction amongst residents who will be able to enjoy a better work/life balance; and
5. Provide local, national and international market exposure of Western Australia's most promising creative talent.

DESIGN

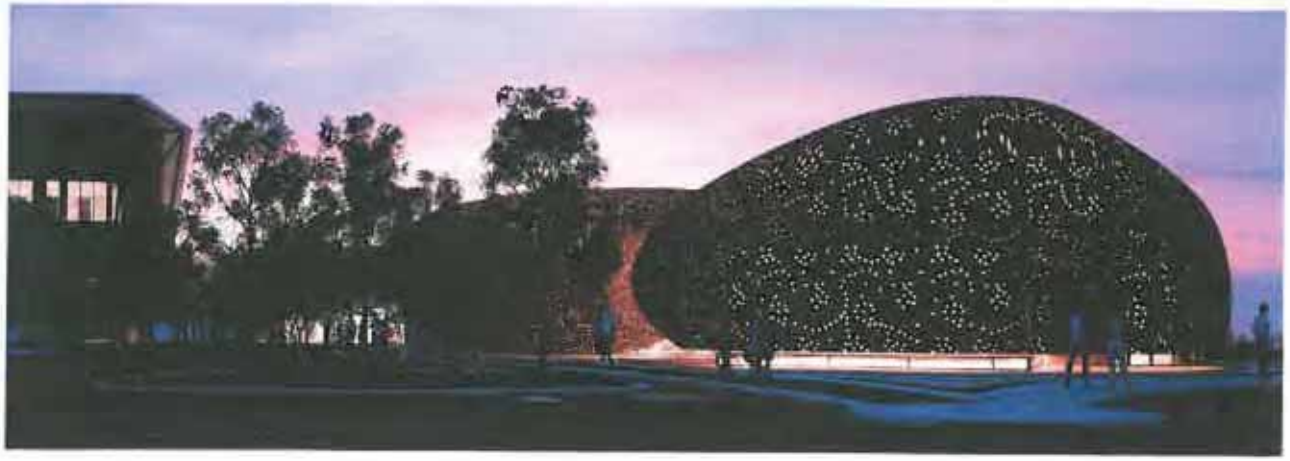
Global architecture firm HASSELL has designed a conceptual scheme for the development, drawing influence from the organic topography of Port Hedland's iconic tidal formations. The cluster of buildings that comprise the cultural heart of the precinct is surrounded by a membrane structure made of Corten steel. By day, the structure protects and shades the buildings and spaces underneath, its perforated surface allowing light to filter through into the surrounding under crofts. By night, the internal light penetrates out through the building's exterior skin, transforming the precinct into a glowing beacon.

The fluid, organic form of the cultural facility is contrasted by the angular aesthetic of the commercial building located behind. The design of the commercial façade utilises layers of Corten screens, creating an interesting exterior articulation, whilst providing shelter from the sun and wind.

Positioned at the heart of the precinct is a large public plaza which functions as a gathering point and a location for special events. The working studios open out onto the plaza, adding an additional layer of interest and activation. A public promenade extends through this space to a viewing platform at the end of the pier and a foreshore boardwalk beyond.

With undisturbed views to the water and the round-the-clock activity of the port, the restaurant and upper level bar will be a popular drawcard for residents and visitors to the West End. It will also attract international attention through the sophisticated design that reflects the distinctiveness of the Pilbara.

The West End Commercial and Cultural precinct makes a bold statement. It gives a sense that it has emerged from the coastal landscape surrounding it, yet it will feel like walking into a work of art.

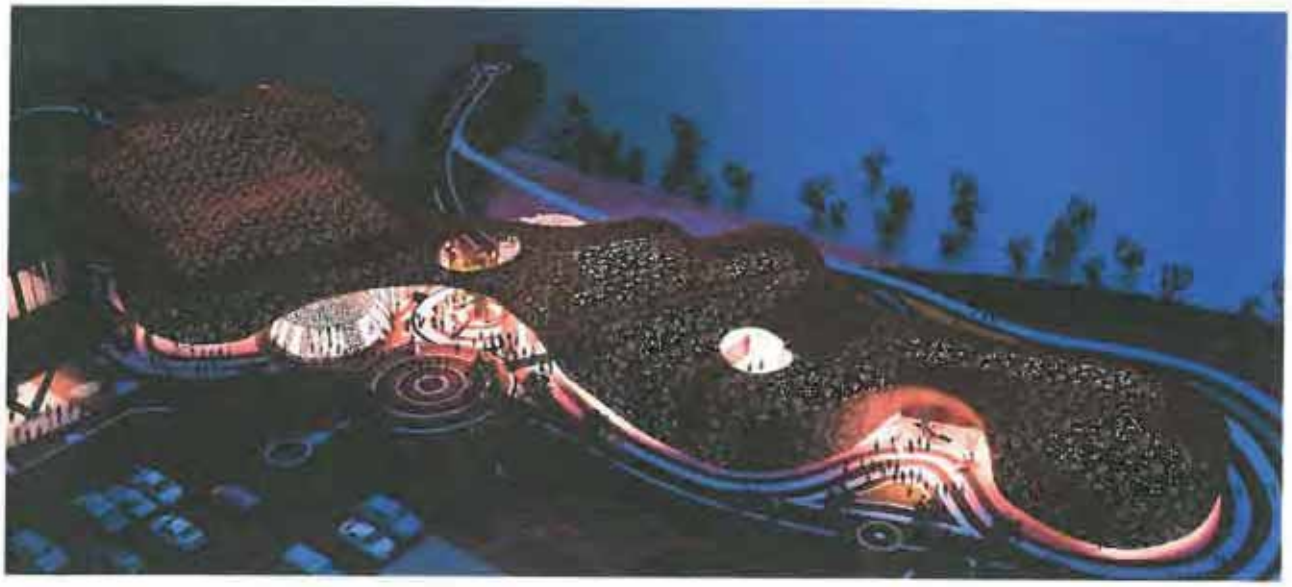


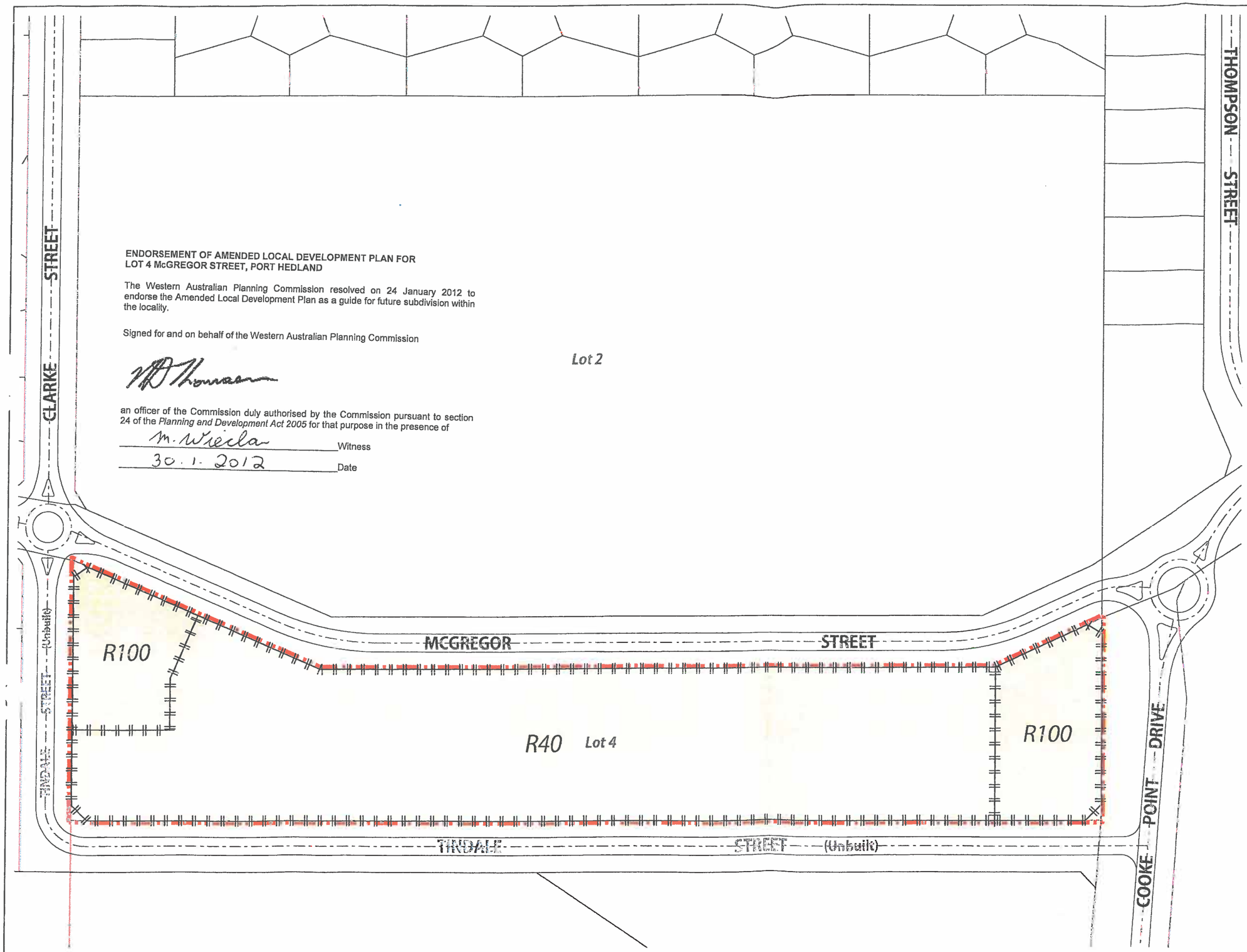
PARTNERING + FUNDING

A development of this scale has been identified for the West End in the Growth Plan. The Town of Port Hedland and BHP Billiton would need to contribute the land to enable the full development with a financial investment needed from BHP Billiton that would be matched by Royalties for Regions to cover the construction. An order of magnitude costing is being undertaken. The longer term management will be based on a model whereby the operating costs will be generated by the development.

Commercial leases over the office block, conference space and restaurant facilities will be factored into the business model.

The Gallery and its Pilbara location would be promoted into Asia with partnerships brokered in China, Japan, Korea and India with cultural and academic institutions wishing to explore joint programming and potential placements for research graduates. Initial discussions have been had with the University of Western Australia who have expressed a keen interest in establishing research placements in the Pilbara in several academic fields. The broadening of the cultural programming to explore strategic alliances with the major trading partners of State will also build a more cosmopolitan and outward looking community that is well placed within the region.





ENDORSEMENT OF AMENDED LOCAL DEVELOPMENT PLAN FOR LOT 4 McGREGOR STREET, PORT HEDLAND

The Western Australian Planning Commission resolved on 24 January 2012 to endorse the Amended Local Development Plan as a guide for future subdivision within the locality.

Signed for and on behalf of the Western Australian Planning Commission

an officer of the Commission duly authorised by the Commission pursuant to section 24 of the *Planning and Development Act 2005* for that purpose in the presence of

M. Wiecla
Witness

30. 1. 2012
Date

DEVELOPMENT PLAN PLANNING CONDITIONS

DEVELOPMENT PLAN - LOT 4 MCGREGOR STREET

1. This Development Plan (Plan) applies to the land contained within the inner edge of the red dotted line.
2. The purpose of this Plan is to detail how the development of the site will be undertaken. In particular this Plan applies residential density codes, and road layouts.
3. The Plan may be subject to further refinement at the subdivision stage.
4. The Development specifications outlined in chapters 3, 4 and 5 of the accompanying Planning Report apply to the development of thoroughfares, landscape, cut and fill and built form where shown within the Development Plan area.
5. Development on the subject land shall comply with State Planning Policy 3.1 - Residential Design Codes', except as varied by this Plan and the provisions of the table below. The following allowances apply:

R-Code - Table 4 - General Provisions for Areas with Coding of Greater than R30

	Min Open Space (% of site)	Min Primary Street Boundary setback (m)
R-Code Provisions for R40 area	45	4
R-Code Variation allowed by this plan	30	2

R-Code - Table 4 - General Provisions for Areas with Coding of Greater than R30

	Maximum Plot Ratio	Maximum Height		
		Top of External Wall	Top of External Wall (concealed roof)	Top of Pitched Roof
R-Code Provisions for R-100 area	1.25	12	13	15
R-100 Variation allowed by this plan	1.5	15	15	18

TIMING AND STAGING

6. Site subdivision and construction works may be undertaken prior to or simultaneously with the decommissioning of the STP and occupation of dwellings may occur with knowledge that the STP will be relocated.

CUT AND FILL

7. Modification of the site's land form is required to achieve appropriate grades for residential development.
8. Land levels and the configuration of roads need to be considered in order to minimise the importation of fill.

STORM SURGE & FLOODING

9. Development levels are to be consistent with the Port Hedland Coastal Vulnerability Study 1:100yr inundation level of 5.9m AHD (or any other level determined to be the 1:100yr level following further modelling and approvals)

ROAD NETWORKS

10. Internal roads may have a 6 m wide carriageway within a 9 m wide road reserve.

GEOTECHNICAL & CONTAMINATION

11. Site works to be undertaken in accordance with measures identified in the Douglas Partners report contained in the accompanying planning report, except as modified by subsequent approved approaches.

OPEN SPACE

12. The Development Plan seeks to maximise the utilisation of the Development Plan Area for housing purposes and to facilitate private open space associated with dwellings.

ENDORSEMENT OF REGISTERED TOWN PLANNER

SIGNATURE: _____ DATE: _____

LOCAL DEVELOPMENT PLAN

Lot 4 Clarke Street, PORT HEDLAND

for: blaxland

LEGEND :

ZONES

Residential

OTHER

R40 R-Codes

NOTES :

- SITE BOUNDARY
- AREAS AND DIMENSIONS SUBJECT TO SURVEY
- CARRIAGEWAYS ARE DIAGRAMMATIC ONLY
- BASE DATA SUPPLIED BY LANDGATE

NORTH

Scale 1: 1,500 @ A3

0 10 20 30 40 50 metres

COMPILED: DPS		DRAWN BY:	MDH
DATE:	29/07/2011	REVISED:	17/11/2011
GRID:	MGA 50	DATUM:	AHD
DRAWING NUMBER:	BLAPH004f	JOBCODE:	BLAPHLSP
FILE ID: M:\BLAPH\BLAPH004f.dgn			

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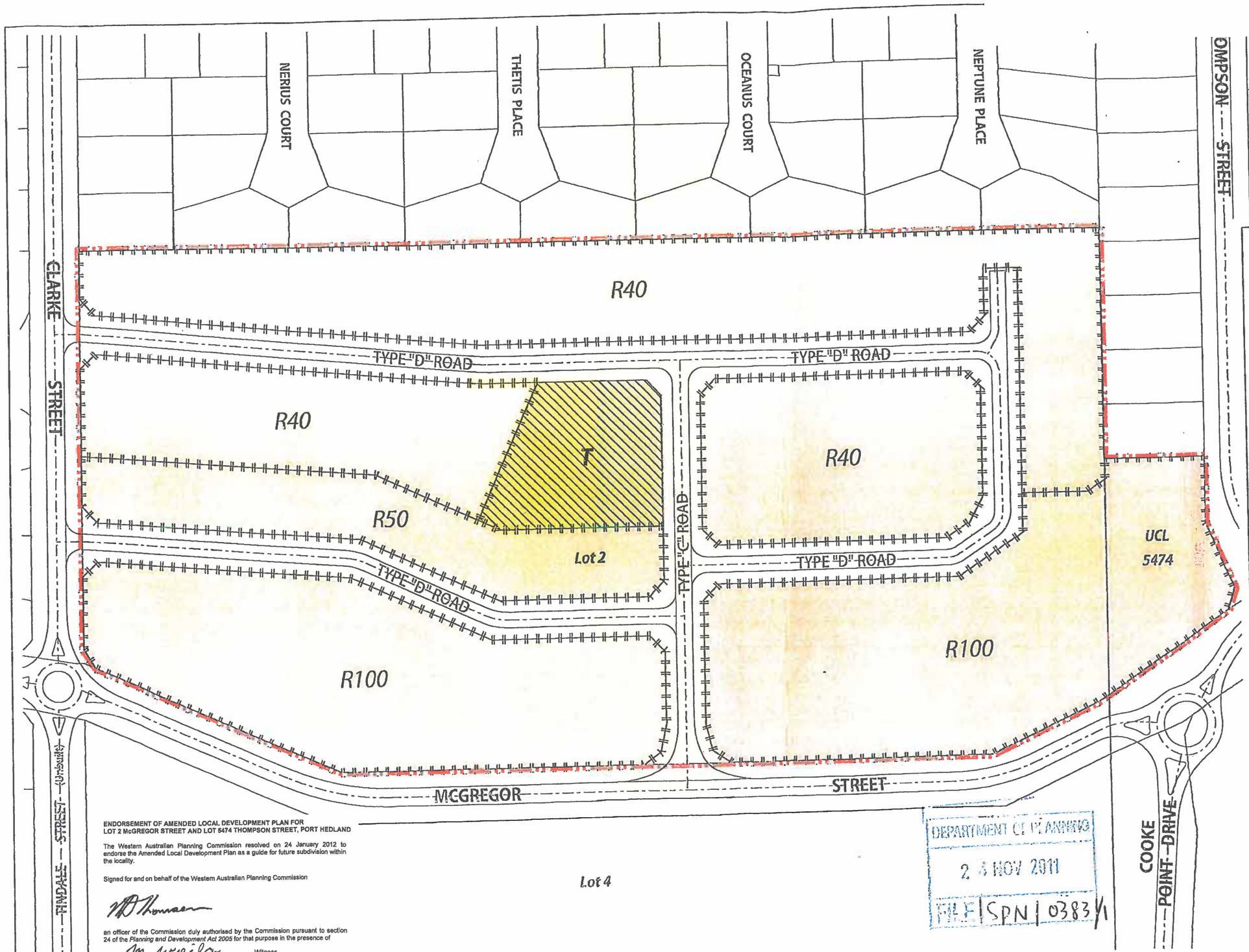

DEVELOPMENT PLAN
PLANNING CONDITIONS

DEVELOPMENT PLAN – LOT 2 & LOT 5474 MCGREGOR STREET

1. This Development Plan (Plan) applies to the land contained within the inner edge of the red dotted line.
2. The purpose of this Plan is to detail how the development of the site will be undertaken. In particular this Plan applies residential density codes, road layouts and signifies the location of the allotment that will remain in Telstra ownership.
3. The Plan may be subject to further refinement at the subdivision stage.
4. The development specifications outlined in chapters 3, 4 and 5 of the accompanying Planning Report apply to this Development Plan, except where updated by subsequent approved modifications.
5. Development on the subject land shall comply with State Planning Policy 3.1 – Residential Design Codes', except as varied by this Plan with respect to the maximum plot ratio and building height in the R-100 Code area. For the R-100 area, the following allowances apply:

	Maximum Plot Ratio	Maximum Height		
R-Code Provisions for R-100 area	*1.25*	*12*	*13*	*15*
R-100 Variation allowed by this Plan	*1.5*	*15*	*15*	*18*

TIMING AND STAGING

6. Site subdivision and construction works may be undertaken prior to or simultaneously with the decommissioning of the STP and occupation of dwellings may occur with knowledge that the STP will be relocated.

CUT AND FILL

7. Modification of the site's land form is required to achieve appropriate grades for residential development.
8. Land levels and the configuration of roads need to be considered in order to minimise the importation of fill.

STORM SURGE & FLOODING

9. Development levels are to be consistent with the Port Hedland Coastal Vulnerability Study 1:100yr inundation level of 5.9m AHD (or any other level determined to be the 1:100yr level following further modeling and approvals).

ROAD NETWORKS

10. Type "C" road to be 15.4m wide, 6.4m pavement with 4.5m wide verge either side, footpath on one side only.
11. Type "D" road to be 15.0m wide, 6.0m pavement with 4.5m wide verge either side, footpath on one side only.

GEOTECHNICAL & CONTAMINATION

12. Site works to be undertaken in accordance with measures identified in the Douglas Partners report contained in the accompanying planning report, except as modified by subsequent approved approaches.

OPEN SPACE

13. The Development Plan seeks to maximise the utilisation of the Development Plan Area for housing purposes and to facilitate private open space associated with dwellings.

ENDORSEMENT OF REGISTERED TOWN PLANNER

SIGNATURE: _____ DATE: _____

ENDORSEMENT OF AMENDED LOCAL DEVELOPMENT PLAN FOR LOT 2 McGREGOR STREET AND LOT 5474 THOMPSON STREET, PORT HEDLAND

The Western Australian Planning Commission resolved on 24 January 2012 to endorse the Amended Local Development Plan as a guide for future subdivision within the locality.

Signed for and on behalf of the Western Australian Planning Commission

an officer of the Commission duly authorised by the Commission pursuant to section 24 of the *Planning and Development Act 2005* for that purpose in the presence of

M. Wiseila — Witness

30.1.2012 — Date

DEPARTMENT OF PLANNING
2 3 NOV 2011
FILE SPN 0383/1

LOCAL DEVELOPMENT PLAN

Lot 2 McGregor Street and Lot 5474 Thompson Street, PORT HEDLAND

for: blaxland

LOCAL SCHEME RESERVES
- Other Public Purposes (T – DENOTED AS: TELECOMMUNICATIONS)
- Local Road

ZONES
- Residential

OTHER
- R40 – R-Codes

NOTES :
- SITE BOUNDARY
- AREAS AND DIMENSIONS SUBJECT TO SURVEY
- CARRIAGEWAYS ARE DIAGRAMMATIC ONLY
- BASE DATA SUPPLIED BY LANDGATE

NORTH

Scale 1: 1,500 @ A3

0 10 20 30 40 50 metres

COMPILED: DPS		DRAWN BY:	MDH
DATE:	13/07/2011	REVISED:	17/11/2011
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