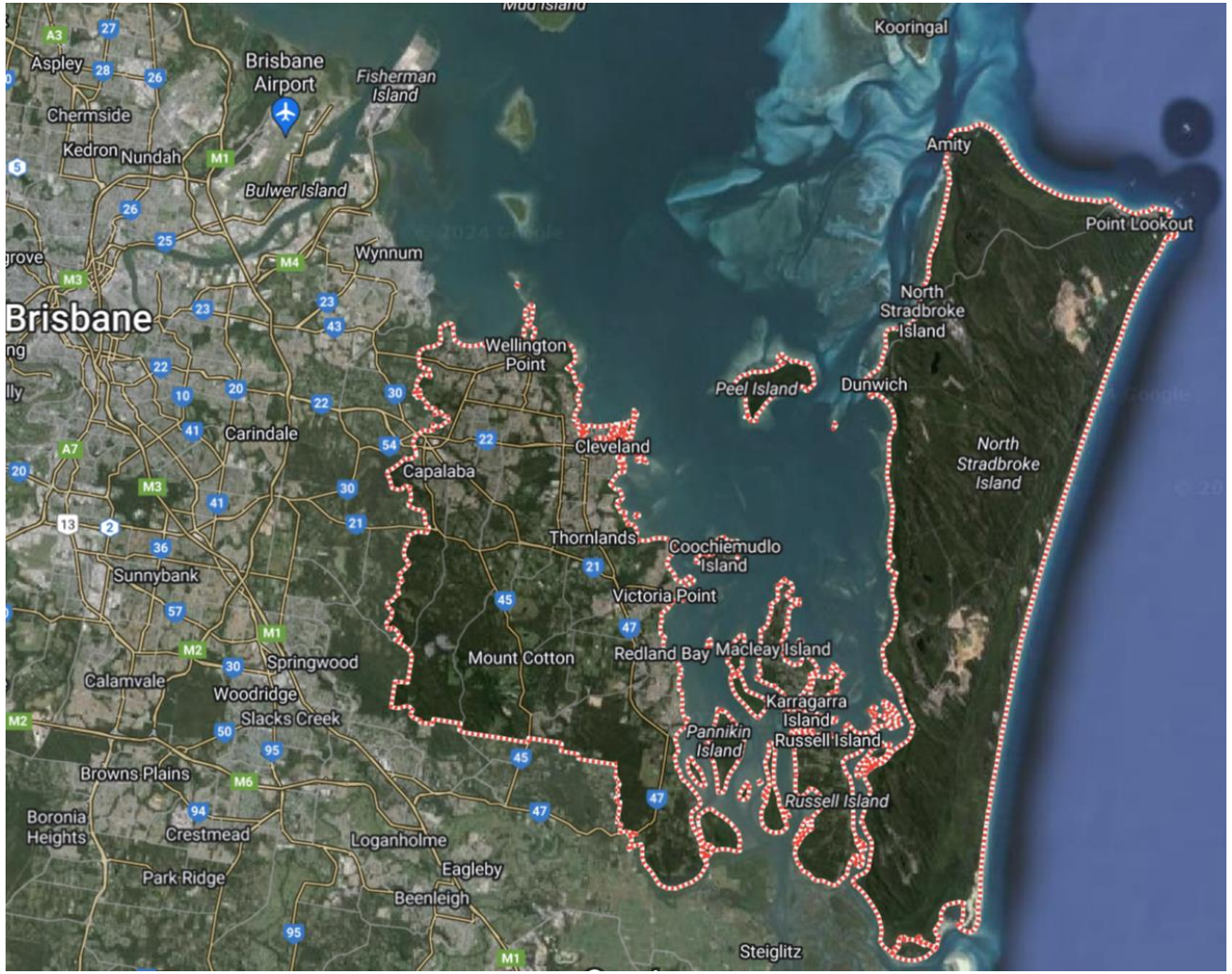
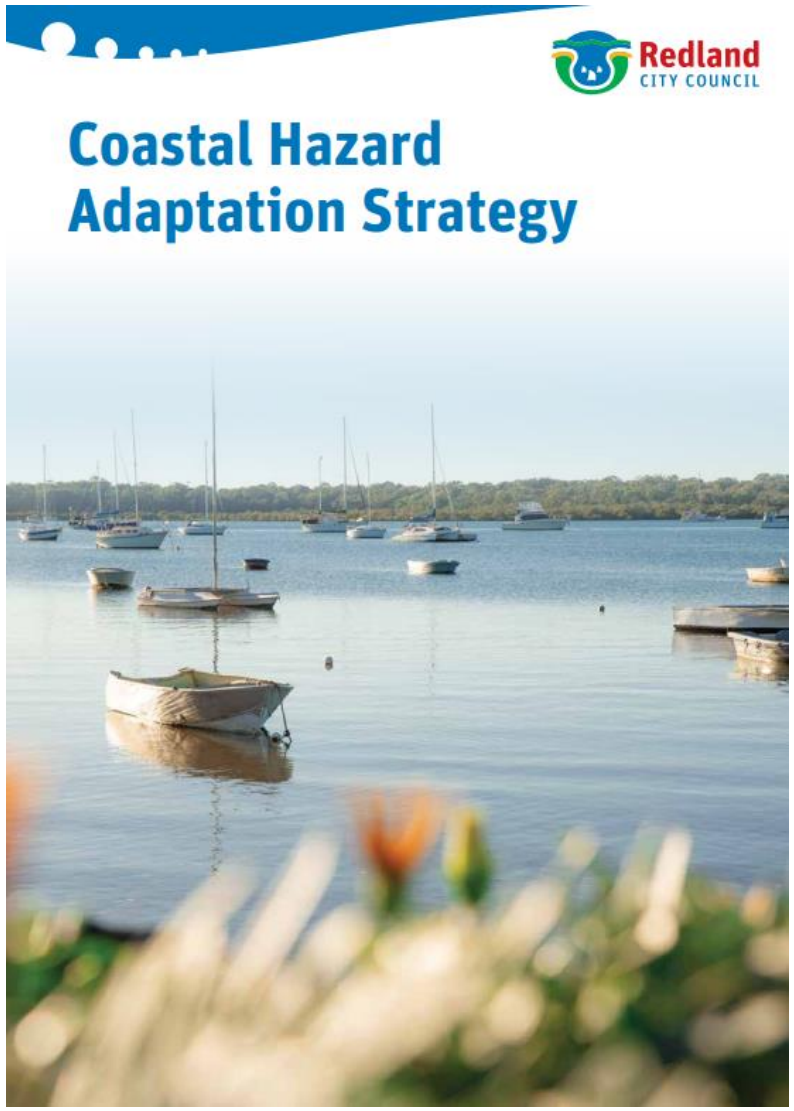
# Redlands Coast Living Shorelines Pilot Program

# Where is the Redland LGA?




# Project Background




Redland City Council adopted its CHAS in 2021.

Our CHAS recommended Council undertake two trial sites for the design and establishment of living shorelines, using combined vegetation and minor structural protection works and monitoring the effectiveness of this approach for mitigating coastal hazard risk.

LGAQ have awarded Redland City Council grant funding to undertake design, approvals and construction of two pilot sites.

# Traditional Coastal Protection Structures

- Do a great job at protecting land behind the structure, controlling erosion and protecting from overtopping and inundation,
- Removes or alters foreshore environment and the associated ecological benefits,
- Costly to build and maintain,
- Permitting and approval requirements.

# What is a Living Shoreline?

- Natural ecosystems contribute to coastal hazard risk reduction, via increased bed friction, local shallowing of water, sediment deposition and building of vertical biomass.

- Nature-based methods are adaptive to a changing climate, and can self-repair after storm events.

- In this instance our Living Shorelines pilots are our attempt to recreate, or hybrid engineer a natural solution to coastal erosion.

# Living Shoreline Pilot Objectives

- Demonstrate the role they can play in coastal hazard mitigation,
- Develop options and designs to enable future implementation,
- Construct and trial different types of designs, materials, and construction techniques,
- Determine permit and approval requirements,
- Facilitate a template for Council to implement further Living Shorelines.

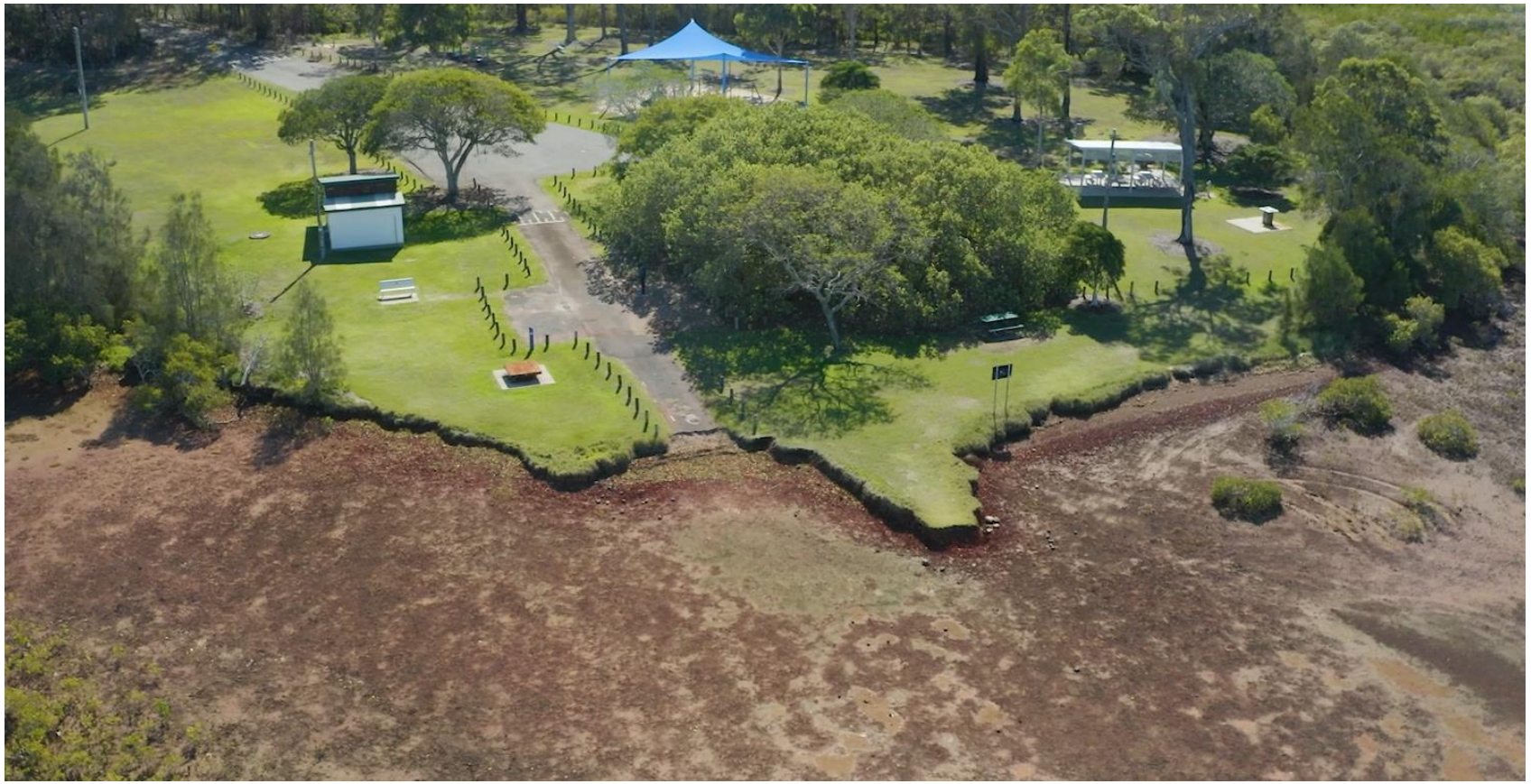
# Pilot Locations

**PILOT SELECTION CRITERIA**

- Sites experiencing ongoing erosion,
- Sites representative of broader Redlands coastline,
- Sites to have community infrastructure nearby,
- Sites to not have critical infrastructure nearby in case of living shoreline failure or pathway change,
- Sites to have community foot traffic for passive community engagement,
- Sites with minimal viewlines from private residences,
- Sites with nearby vegetation that can be tapered into.

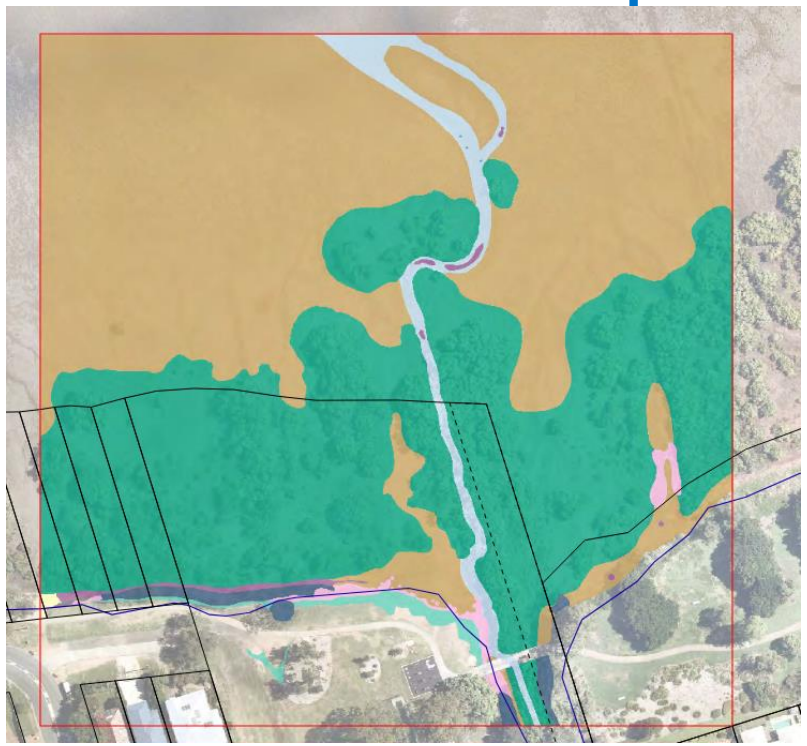
# Site 1 - Three Paddocks Park, Birkdale


# Site 2 - Oyster Point Park, Cleveland




# Phase 1 (Complete) - Concept Development & Concept Design

- Site Surveys,
- Marine Plant Survey,
- Coastal Process Studies,
- Concept Design,
- Concept Design Report; including options appraisal, indicative costs, indicative maintenance, indicative monitoring plan.



220320 RCC Soft Engineering

Map 4: Distribution of Marine Plants and Other Marine Habitats: Three Paddocks Park, Birkdale

LEGEND

Study area

Cadastre
- Lot boundary
- Easement
- Highest astronomical tide (QLD Government 2021)

Marine plants
- Mangrove
- Seagrass
- Saltmarsh
- Saltmarsh dominated by *S. virginicus*
- Casuarina

Transitory marine plants
- Bare Mud
- Detritus

Other
- Outlet channel
- Rock wall
- Sand

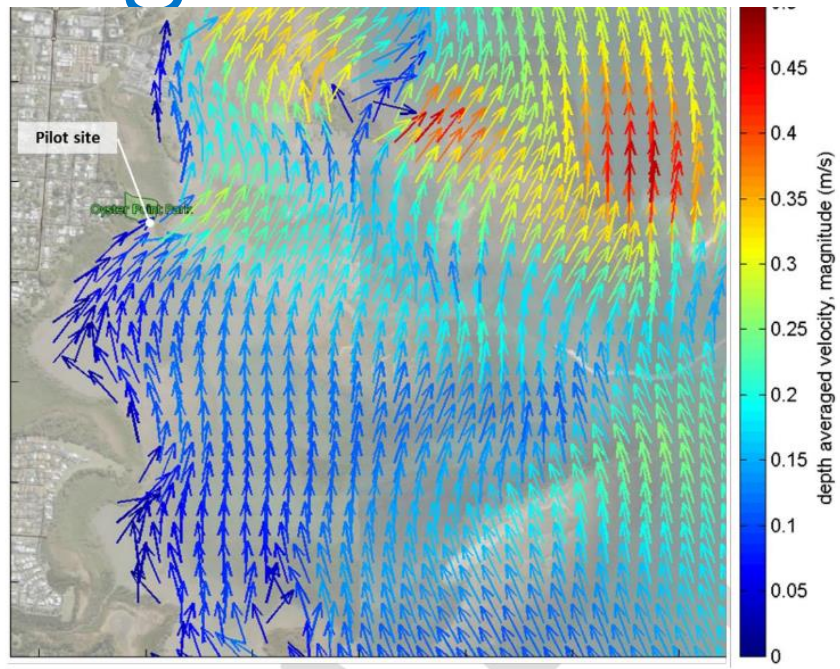



Figure 4-14: General tidal currents during ebb tide at Oyster Point Park

# Potential Options

- Bank regrading to stabilise scarp heights,
- Vegetation – Dune, mangrove and salt marsh,
- Low scale engineering toe and/or bank protection; such as log jams, rock fillets, reef balls, rocks fillets, pocket breakwaters,
- Planted revetments.

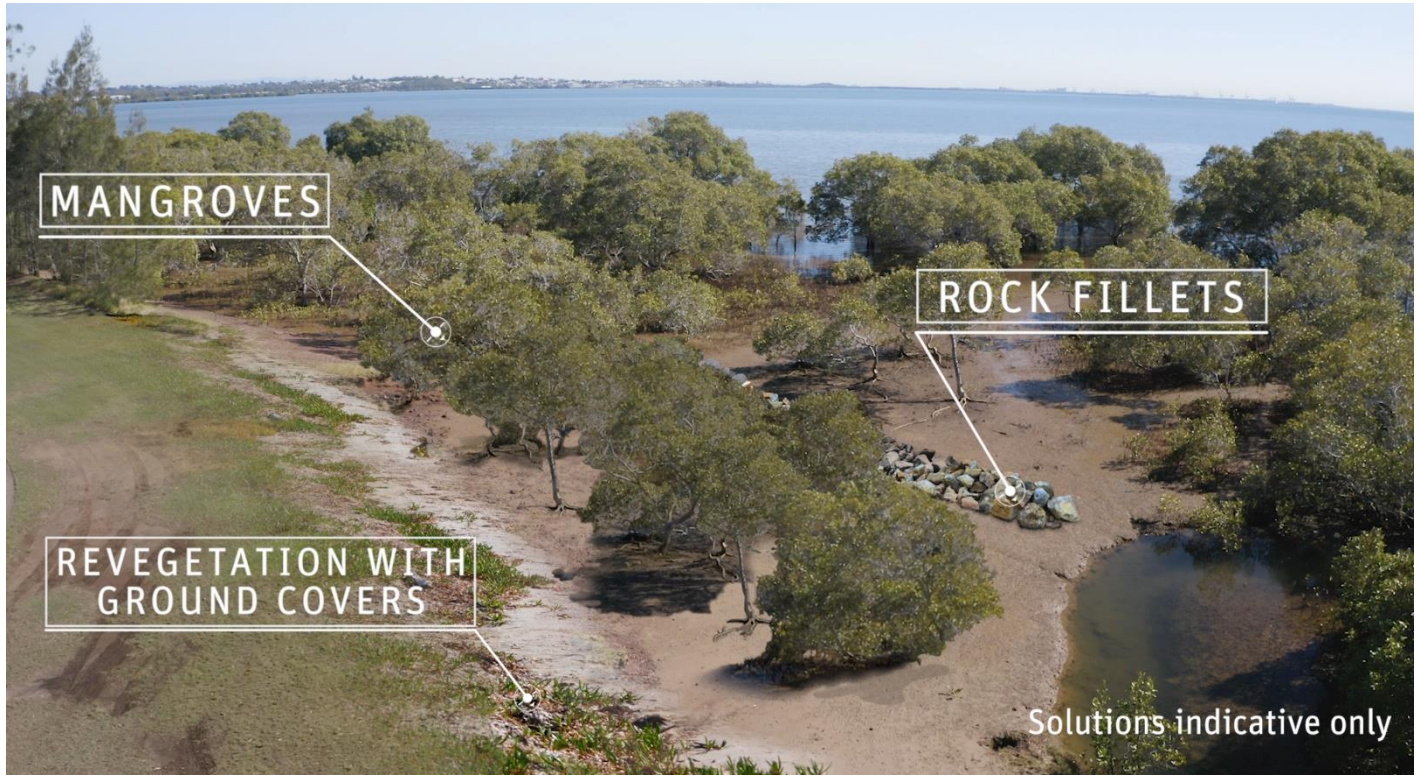






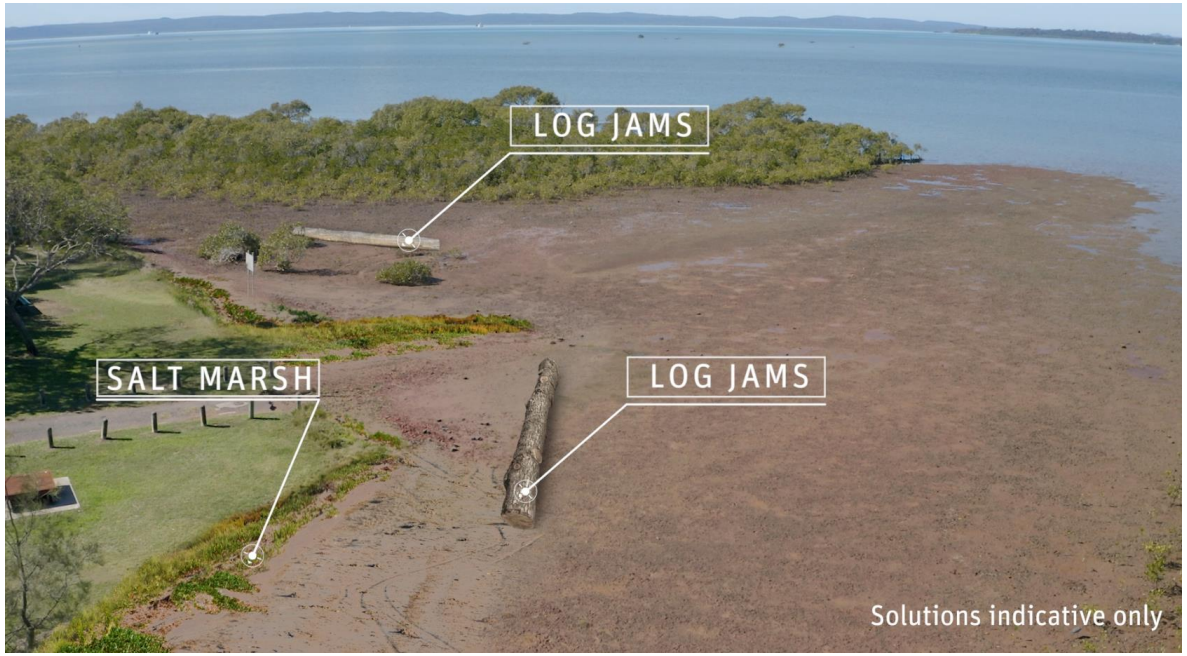

# Phase 2 (In progress) – Detail Design, Permits and Approvals, Construction

- Detail Design
- Design Reports
- Maintenance Program
- Monitoring Program
- Cost Estimates
- Whole of Life Costings
- Permits and Approvals
- Construction Methodology
- Safety in Design
- Certification
- Communications
- Webpage
- Factsheet
- Site Signage
- Video

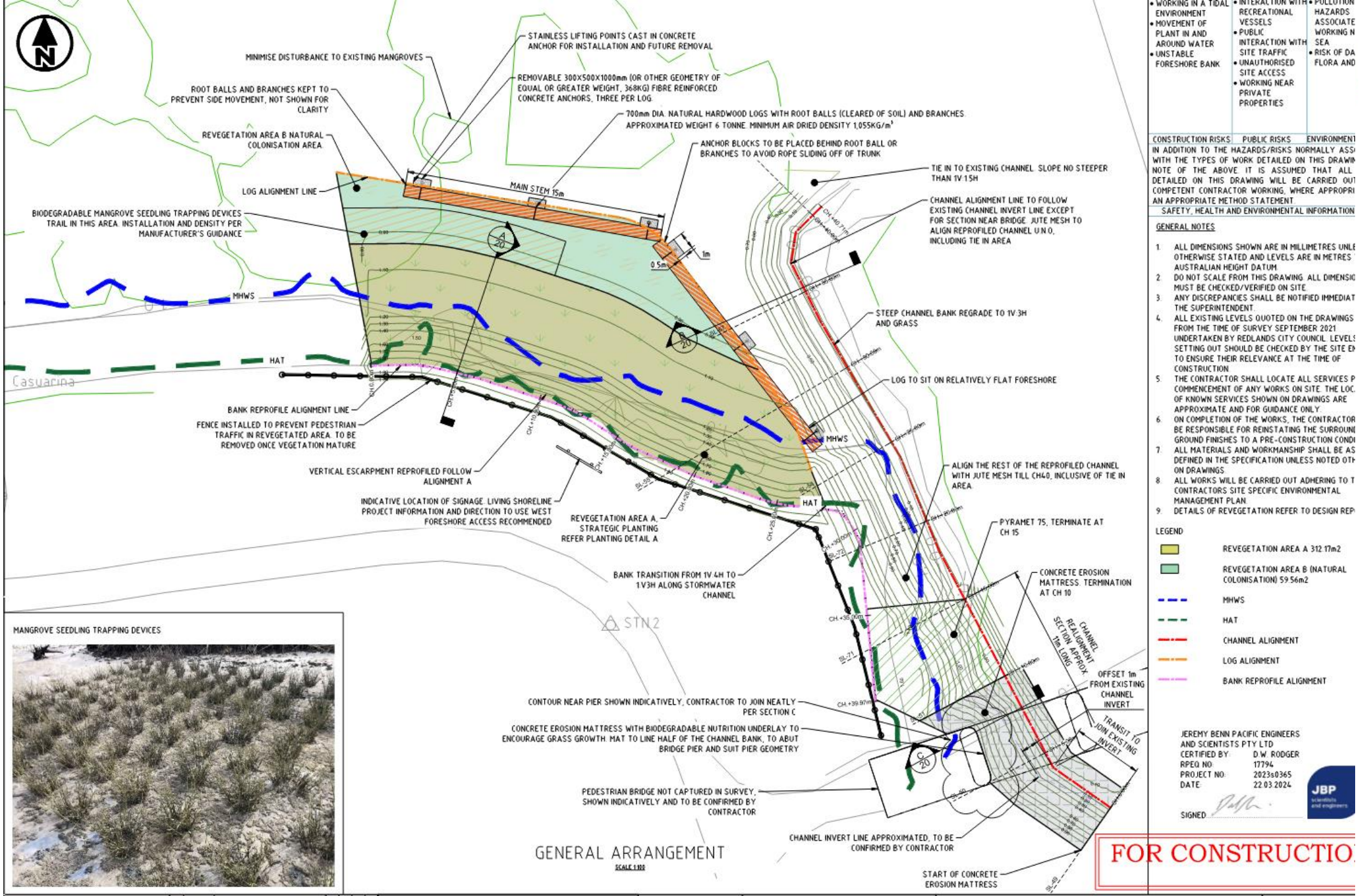


# Functional Design Requirements

- Provide measurable shoreline protection against erosion,
- Have increased ecological and social benefits,
- Provide continued public access to enjoyment of the foreshore,
- Have design and specifications capable of being documented (and potentially certified),
- Be capable of gaining permits and approvals,
- Minimise capital costs and ongoing maintenance requirements,
- Minimise construction and disturbance areas,
- Minimise design, construction, operation, and maintenance risks.



# Three Paddocks Park




MANGROVE SEEDLING TRAPPING DEVICES



## GENERAL ARRANGEMENT

SCALE 1:100

| • WORKING IN A TIDAL ENVIRONMENT<br>• MOVEMENT OF PLANT IN AND AROUND WATER<br>• UNSTABLE FORESHORE BANK | • INTERACTION WITH RECREATIONAL VESSELS<br>• PUBLIC INTERACTION WITH SITE TRAFFIC<br>• UNAUTHORISED SITE ACCESS<br>• WORKING NEAR PRIVATE PROPERTIES | • POLLUTION HAZARDS ASSOCIATE WORKING N SEA<br>• RISK OF DA FLORA AND |
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| CONSTRUCTION RISKS | PUBLIC RISKS | ENVIRONMENT |
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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

GENERAL NOTES

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8. ALL WORKS WILL BE CARRIED OUT ADHERING TO T CONTRACTORS SITE SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN.
9. DETAILS OF REVEGETATION REFER TO DESIGN REP

LEGEND

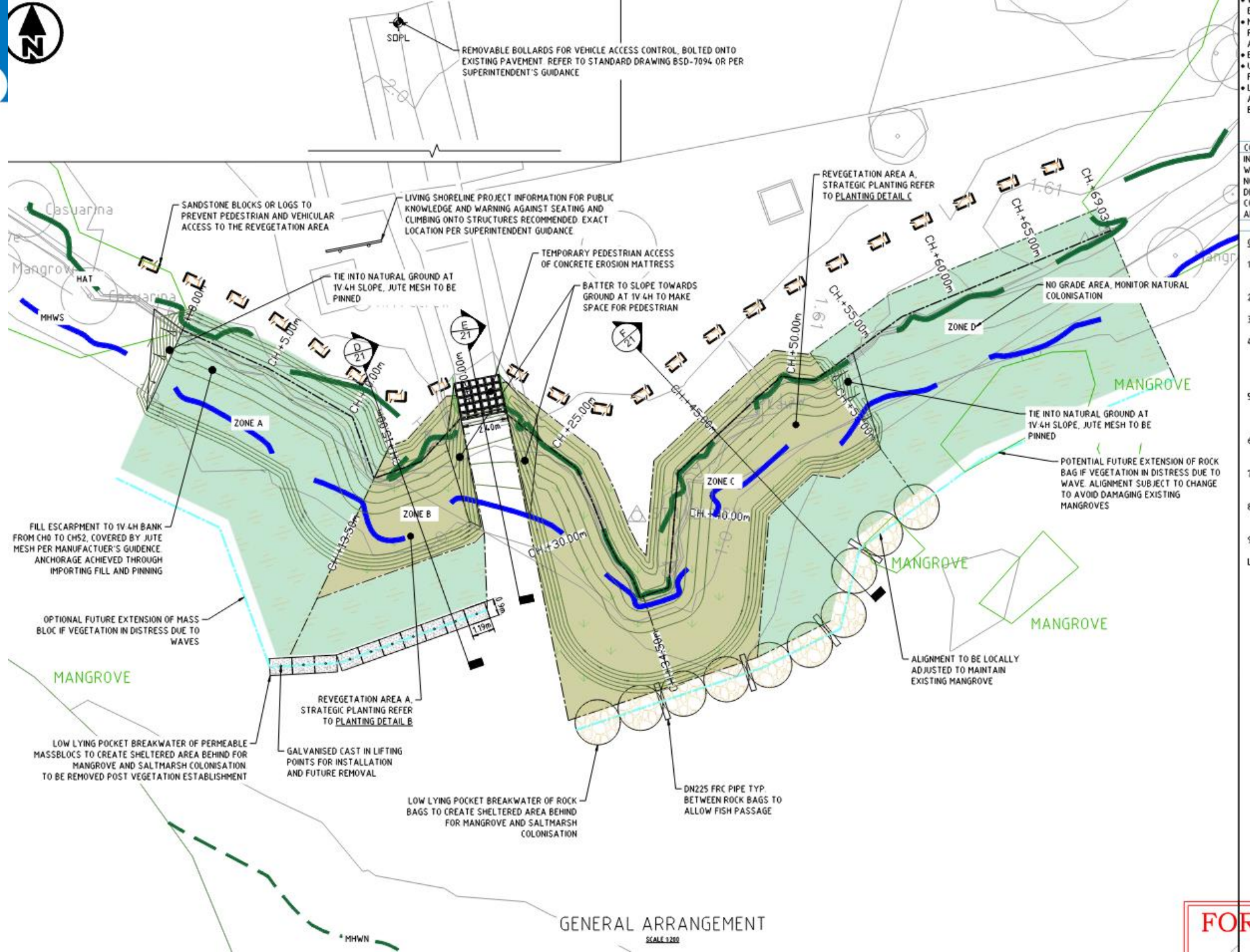
- REVEGETATION AREA A 312.17m2
- REVEGETATION AREA B (NATURAL COLONISATION) 59.56m2
- MHWS
- HAT
- CHANNEL ALIGNMENT
- LOG ALIGNMENT
- BANK REPROFILE ALIGNMENT


JEREMY BENN PACIFIC ENGINEERS AND SCIENTISTS PTY LTD
CERTIFIED BY: D.W. RODGER
RPEQ NO: 17794

PROJECT NO: 2023s0365
DATE: 22.03.2024
SIGNED:

FOR CONSTRUCTIO

Oyster Point Park




GENERAL ARRANGEMENT

SCALE 1:200

| ENVIRONMENTAL | RECREATIONAL VESSELS | HAZARDS ASSOCIATED W WORKING NEAR SEA |
|---|---|---|
| • WORKING IN A TIDAL ENVIRONMENT<br>• MOVEMENT OF PLANT IN AND AROUND WATER<br>• EXCAVATION<br>• UNSTABLE FORESHORE BANK<br>• LIFTING / CRANE ACTIVITY ON SOFT BANK | • PUBLIC INTERACTION WITH SITE TRAFFIC<br>• UNAUTHORISED SITE ACCESS<br>• WORKING NEAR PRIVATE PROPERTIES | • RISK OF DAMA FLORA AND FA |

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9. DETAILS OF REVEGETATION REFER TO DESIGN REPORT

LEGEND

- REVEGETATION AREA A 241m2
- REVEGETATION AREA B (NATURAL COLONISATION) 356m2
- MHWS
- HAT
- BANK REPROFILE ALIGNMENT
- ROCK BAG ALIGNMENT
- MASS BLOC ALIGNMENT


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FOR CONSTRUCTION

# Permits, Approvals and Legislative Requirements

- Marine Park Permit,
- State tidal works approvals,
- Cultural Heritage,
- Native Title,
- Environment Protection and Biodiversity Conservation Act (EPBC Act).

# State Operational Works Approval

Development permit for operational works for tidal works, including prescribed tidal works (i.e. works in local government tidal waters), or works within the Coastal Management District. **Referral to SARA required to address *State code 8: Coastal development and tidal works***

Development permit for Operational works for the removal, destruction or impacts on marine plants**. Referral to SARA required to address *State code 11: Removal, destruction or damage of marine plants.***

**State Codes are geared towards development and not towards revegetation or nature-based solutions where protection of foreshore land is proactive prior to critical infrastructure or property being impacted**. Thus, some responses to performance outcomes in the State Codes were tailored to meet the overall purpose of the code because it was not possible, or very difficult to be able to meet the Performance Outcome, example below.

| Performance Outcome | Response |
|---|---|
| **PO10 Erosion control structures (excluding revetments) are only constructed where there is an imminent threat to significant buildings or infrastructure, and there is no feasible option for either:**<br><br>**1. beach nourishment; or**<br><br>**2. relocation or abandonment of structures.** | <u>Alternative response addressing Purpose of Code.</u><br><br>The proposed coastal protection works are required to protect Council assets from substantial coastal erosion. Oyster Point Park is community infrastructure which has been subject to progressive erosion, which will be the focus of the nature-based designs. The coastal protection works comply with the purpose of this code by ensuring that works are designed and located to:<br><br>1. protect infrastructure from the impacts of coastal erosion.<br>2. maintain coastal processes by restoring the growth and spread of plants and succession of plant communities, that have a specific role in trapping sediment and building landforms and stabilising sediments against erosion.<br>3. conserving coastal resources including;<br>• the beach and dune system,<br>• habitat, plant and animal diversity<br>• and cultural resources and sites.<br>4. maintaining appropriate public use of, and access to and along, State coastal land.<br>5. accounting for the projected impacts of climate change – the proposed works are a recommendation of Councils Coastal Hazard Adaptation Strategy; this pilot project is intended to build understanding of the solutions that will be adaptable to the impact of climate change.<br>6. & 7. – The projects provide net environmental benefit. |
| **Table 1 – Example State code 8: Coastal development and tidal works performance outcome response** | |

*Erosion control structure means a structure designed to protect land or to permanently alter sediment transport processes and includes structures such as revetments (including seawalls), groynes, artificial reefs, or breakwaters.*

# What next?

- Oyster Point Park determination with respect to EPBC Act, and subsequent timing of construction.
- Construction works packages being prepared for Three Paddocks Park, plan to build this year.
- Finalise project communications, factsheets, video, infographic, site signage and webpage.
- State has conditioned a flora and fauna monitoring program for pre-construction and post-construction. Strict reporting requirements to State, but it can form evidence base to support incorporating Living Shorelines into State Codes.
- University interest in pilots.
- Projects that can manage/maintain view lines.
- More no dig designs.
- Other design solutions for pilots to consider - reef breakwater, oyster reefs, sandy beach pilot.