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FOR REVIEW

A Thriving, Resilient, Living Coastline - 75 Year Plan
Coastal Adaptation Master Plan

Hindmarsh River (Latung) to Inman River (Muwerangi)

Prepared for City of Victor Harbor
by JPE Design Studio

25098 - Coastal Adaptation
Master Plan

15.04.26
Draft Master Plan

Acknowledgement of Country

“ **We acknowledge the Ramindjeri and Ngarrindjeri people, the Traditional Custodians of the land and surrounding waters where we live and work. We acknowledge their deep connection to country and pay our respects to Elders past, present and emerging. This respect is extended to Aboriginal and Torres Strait Islander people across Australia.** ”

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01

Part 01 - Introduction & Context

Introduction

Victor Harbor's coastline will continue to evolve over the next 75 years. In response, this Coastal Adaptation Master Plan has established a long-term strategy for the Inman River (*Latung*) to Hindmarsh River (*Muwerangi*) that supports a resilient, connected and thriving coastal community.

The Master Plan has embraced change as an opportunity to reimagine the foreshore - strengthening ecological systems, enhancing public spaces, and ensuring continued access to the coast for future generations. It has responded to projected sea level rise, coastal processes and changing climate conditions by identifying where protection, adaptation and transformation can occur over time.

Informed by the Coastal Adaptation Study and Strategy (2021) and supported through LGA Coastal Hazard Adaptation Grant funding, the Master Plan has translated technical insights into a place-led vision. It has balanced environmental stewardship with the needs of the Victor Harbor community, recognising the coast as both a valued landscape and a vital part of daily life.

How The Plan Will Be Used

The Master Plan provides Council with a clear and implementable framework to guide decision-making and investment over time. It has identified priority areas, key risks and spatial responses, supported by concept design for locations requiring early action.

Structured across short, medium and long-term horizons, the plan enables Council to align coastal adaptation with asset management, capital works planning and future funding opportunities. It has clarified where interventions such as coastal protection, reconfiguration of infrastructure, or strategic retreat will be most appropriate, ensuring decisions are timely, transparent and evidence-based.

Equally, the Master Plan supports the Victor Harbor community - residents, clubs, businesses and visitors - to better understand how the coastline will change and what this means for access, use and experience over time.

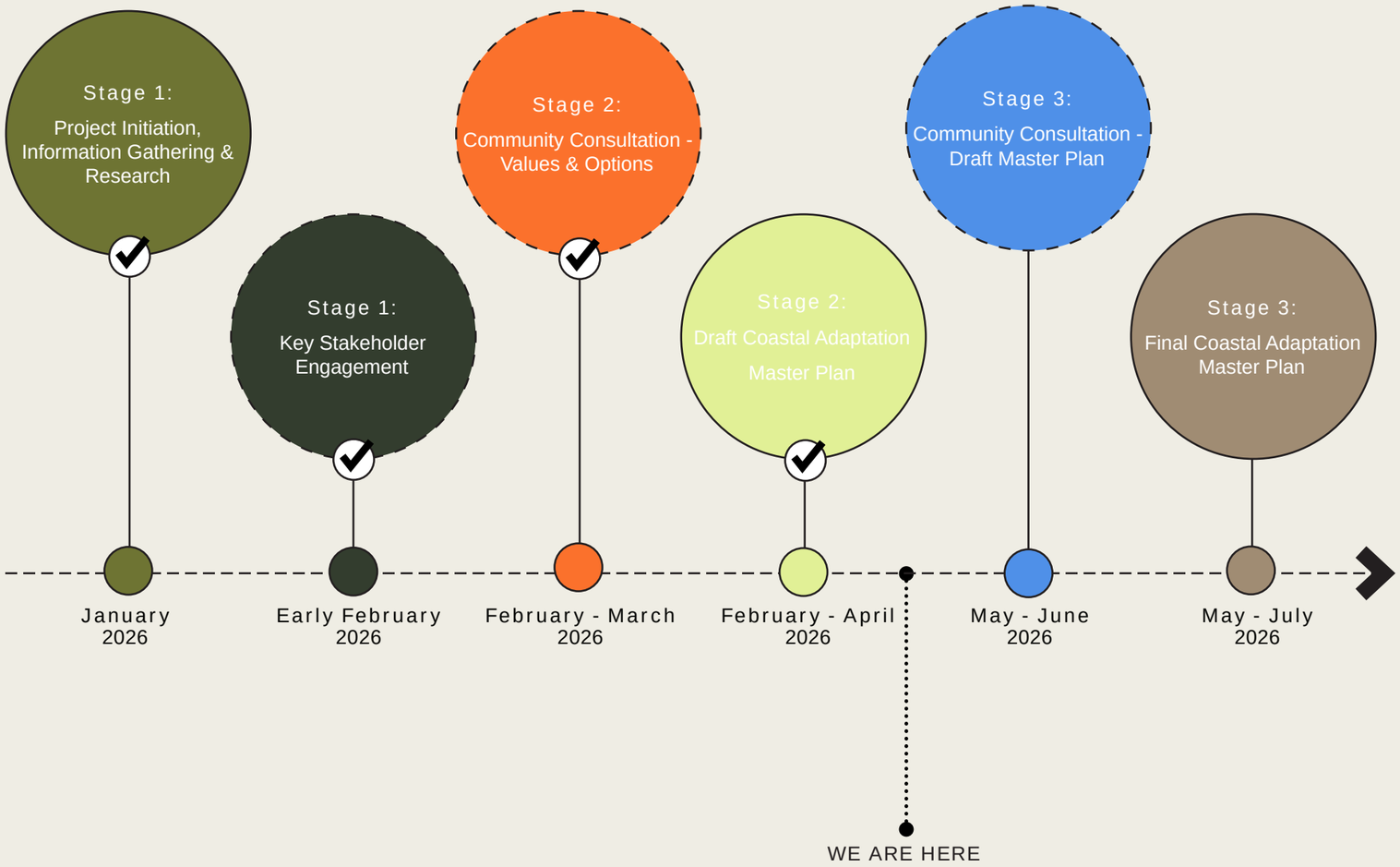
Grounded in technical expertise, existing policy and meaningful engagement, it has created a shared pathway forward - one that enables the community to adapt with confidence while continuing to enjoy and care for this much-loved coastal environment.



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Project Process

The Master Plan process began in January 2026 and will be completed in July 2026 for Council endorsement (in line with LGA Coastal Hazard Adaptation Grant funding). The project process is outlined as follows:



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A Living Coastline



1949
Victor Harbor



2025
Victor Harbor

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A Living Coastline



1900
Distant view of Granite Island, Victor Harbor, and the coastline.



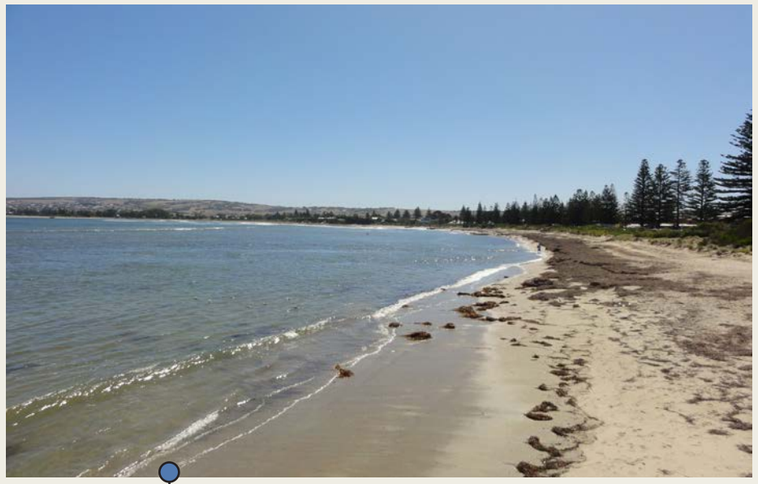
Panoramic aerial view of town roads and buildings with a glimpse of Encounter Bay on the right and open countryside in the distance.
1928



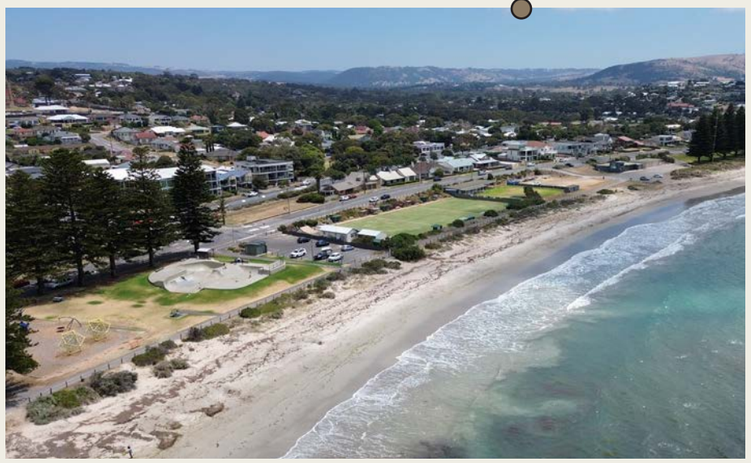
1950
Panoramic view of Victor Harbor, Encounter Bay and the Bluff in the distance.



City of Victor Harbor, viewed from bluff
2004



2011
Victor Harbor

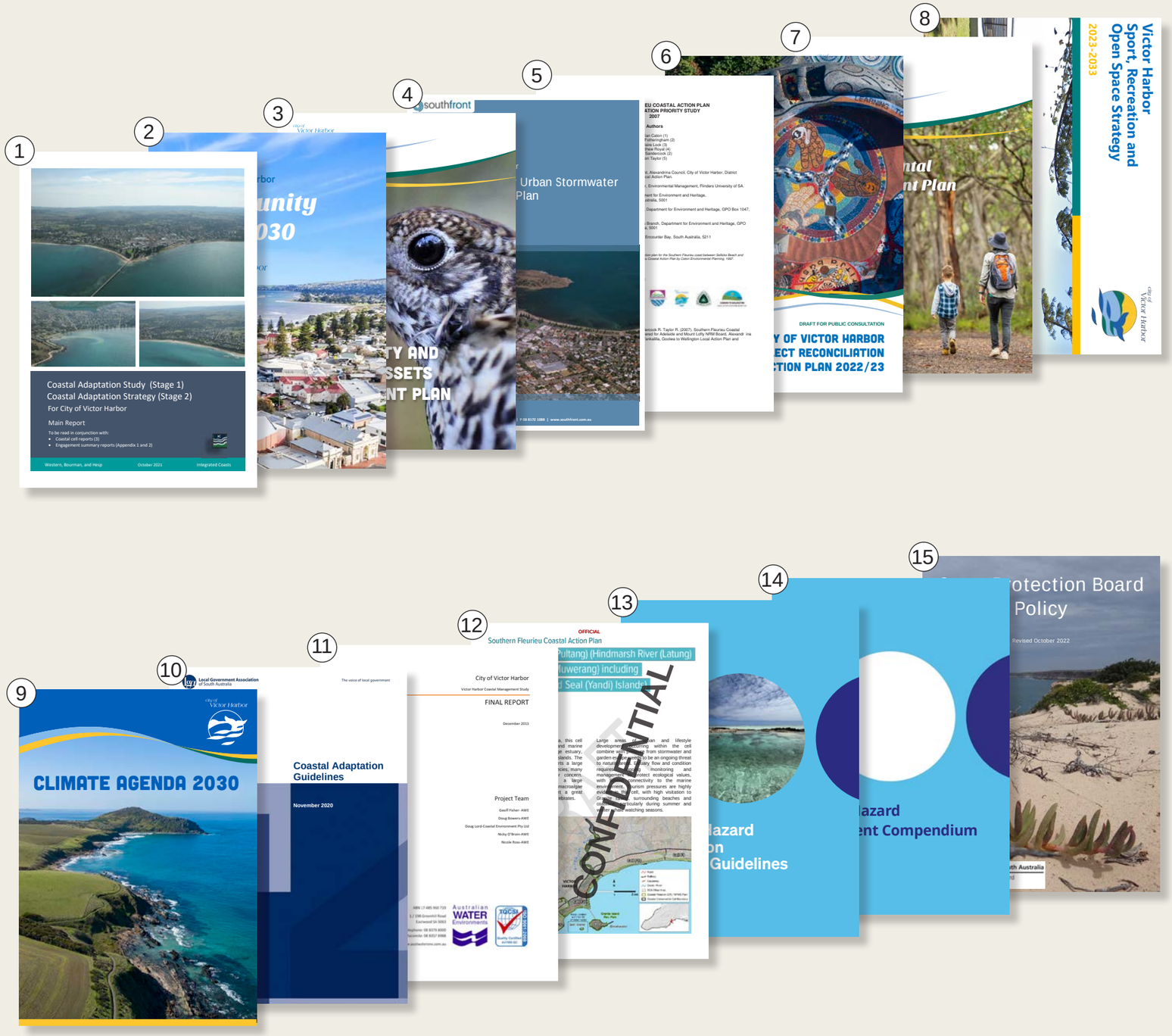


Victor Harbor
Tennis Courts &
Beach Volleyball
2026

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Background Documents

The Coastal Master Plan will align with the following documents and acknowledge Council's existing and previous plans and documents. These include the following:



1	Coastal Adaptation Study & Strategy (and previous consultation)
2	City of Victor Harbor Community Plan 2030
3	Biodiversity and Natural Assets Management Plan 2023-2028
4	Urban Stormwater Management Plan
5	Southern Fleurieu Coastal Action Plan
6	City of Victor Harbor Reflect Reconciliation Action Plan (RAP) 2022/23
7	Environmental Management Plan 2025-2030 (draft)
8	Victor Harbor Sport, Recreation and Open Space Strategy 2022-2033
9	Coastal Adaptation Guidelines (State & National Coastal Policies & Procedures)
10	City of Victor Harbor Victor Harbor Coastal Management Study Final Report December 2013
11	Climate Agenda 2030
12	Southern Fleurieu Coastal Action Plan 2026
13	Coastal Hazard Adaptation Planning (CHAP) Guidelines 2025
14	Coastal Hazard Assessment Compendium 2025
15	Coast Protection Board Policy 2022

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Best Practice - Background Documents

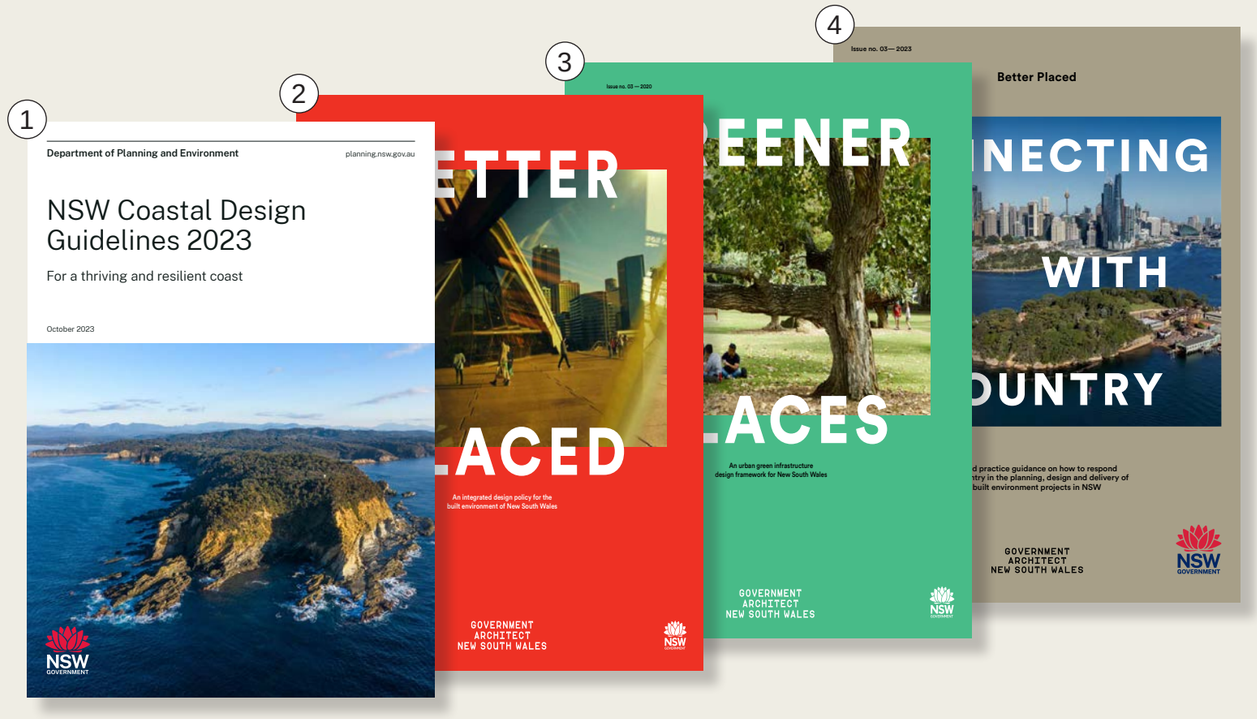
In addition, we have provided several other ‘best practice’ background documents to help guide the Master Plan - these include the following:

1. The NSW Coastal Design Guidelines promote a place-based approach to coastal planning that integrates natural systems, built form and community values. They emphasise ecosystem protection, public access, climate-responsive design and nature-based solutions to guide high-quality and resilient coastal development.

2. Better Placed sets out the NSW Government’s overarching design policy, defining good design as both a collaborative process and a long-term outcome. Its seven design objectives provide a framework for assessing how projects respond to place, users, sustainability and visual quality.

3. The NSW Green Infrastructure Framework positions green infrastructure as essential urban infrastructure and advocates for connected networks of open space, waterways, canopy and habitat. It links green infrastructure to climate adaptation, biodiversity, health and liveability, encourageing integrated and multifunctional design.

4. The Connecting with Country Framework guides projects to be led by Aboriginal knowledge and grounded in Country as a cultural, ecological and spiritual system. It outlines actions to embed cultural safety, heritage protection, community partnership and long-term care into planning and design.



1	NSW Coastal Design Guidelines 2023
2	Better Placed: An Integrated Design Policy for the Built Environment of New South Wales, 2017
3	Greener Places: An Urban Green Infrastructure Design Framework for New South Wales, 2020
4	Connecting with Country: Good Practice Guidance on How to Respond to Country in the Planning, Design and Delivery of Built Environment Projects in NSW, 2023

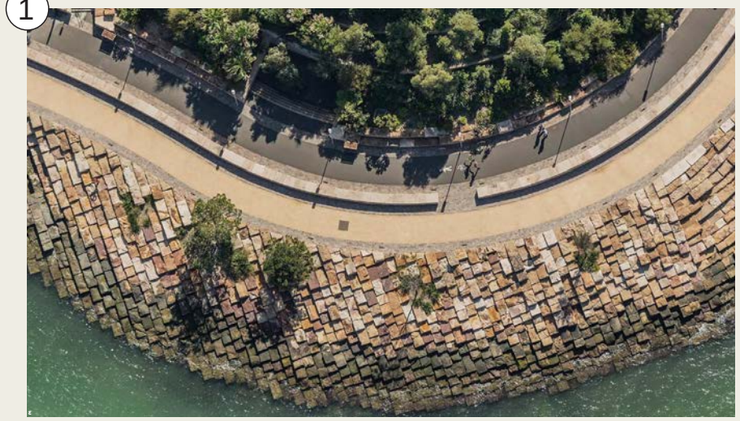
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Exemplar Precedent Projects

The purpose of the provided exemplar precedent projects is to provide a broader story about potential / opportunities provided with this project, and consider natural solutions that benefit places socially & ecologically.

- **Precedent 01:** Barangaroo responds to a common waterfront problem: hard urban edges often provide public access but have very low ecological value. At Watermans Cove, the project addressed this by installing 384 habitat panels beneath the boardwalk, turning a conventional engineered edge into a more biologically active marine habitat.
- **Precedent 02:** Kingscliff faced severe beach erosion and long-term coastal risk, including the added pressure of sea-level rise on the beach and immediate foreshore. The response was not a single engineering fix, but a combined coastal management strategy involving a seawall, sand nourishment, dune rebuilding, and long-term hazard planning based on sea-level-rise scenarios.
- **Precedent 03:** Carss Bush Park, the challenge was an ageing vertical seawall in a public foreshore setting that also had ecological and heritage sensitivities. Instead of simply replacing the wall with another conventional structure, the project introduced a more naturalised edge by combining an environmentally friendly seawall with salt marsh benches, mudflats, rock pools, and intertidal habitat, while maintaining pathways and public access.

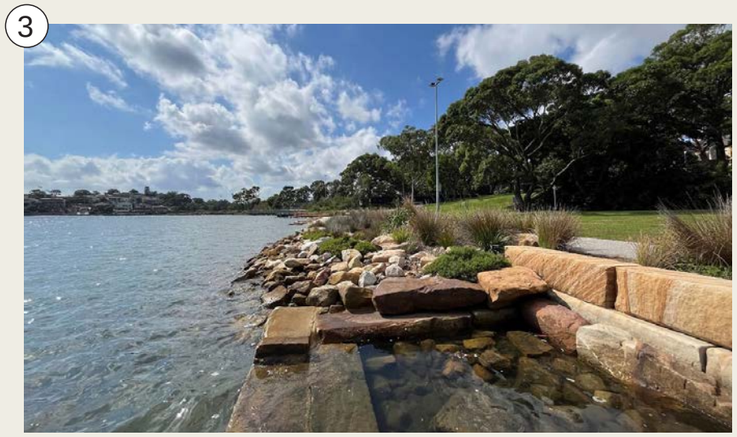
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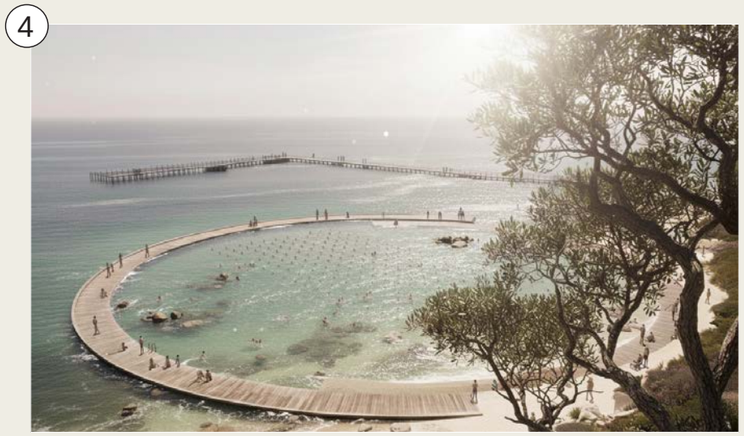
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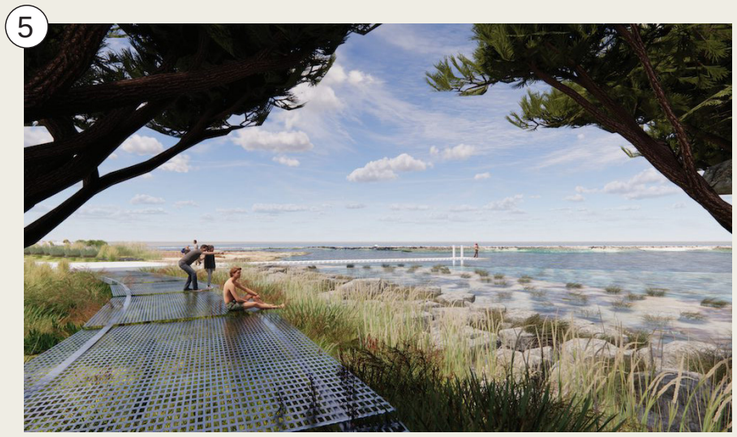
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6



1	Barangaroo + Living Seawalls (Sydney)
2	Kingscliff Coastal adaptation (NSW)
3	Carss Bush Park Foreshore Naturalisation (Kogarah Bay, NSW)
4	Portsea sea bath (Portsea, VIC)
5	Wagonga Inlet Living Shoreline (Narooma, NSW)
6	Bronte Surf Life Saving Club (Sydney, NSW)

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Local Coastal Projects & Community Stewardship

Community stewardship plays an important role in the management of this coastal environment. Local groups are actively involved in conservation and restoration initiatives, including dune rehabilitation, estuary health, habitat enhancement, and shorebird monitoring. These efforts contribute significantly to maintaining and improving ecological values across the precinct. There is also several local projects already undertaken in Victor Harbor, including citizen science programs for coastal monitoring, new sea wall at Yilki and sand nourishment to dunes.

Several coastal community groups are working in Victor Harbor including:

- Victor Harbor Coastcare - monitor coastal dunes
- Hindmarsh River and estuary (Friends of Hindmarsh River Estuary), and Granite Island (Friends of Granite Island) - undertaken a range of conservation and restoration activities across this cell, including species monitoring, extensive weed control and revegetation, significantly increasing habitats and species diversity values.
- Friends of the Hooded Plover Fleurieu Peninsula (supported by BirdLife Australia) and Team Oystercatcher volunteers (SA Shorebird Foundation - monitor and raise awareness of beach nesting and shorebird species within the cell.

These community groups and projects should be referenced in the implementation of the projects identified in the master plan.

1



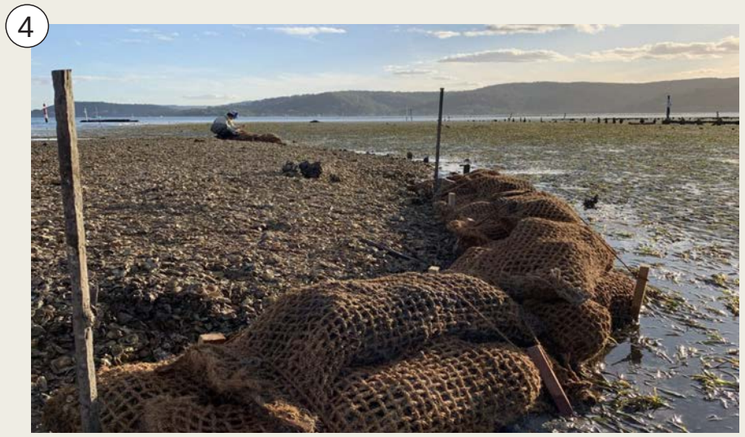
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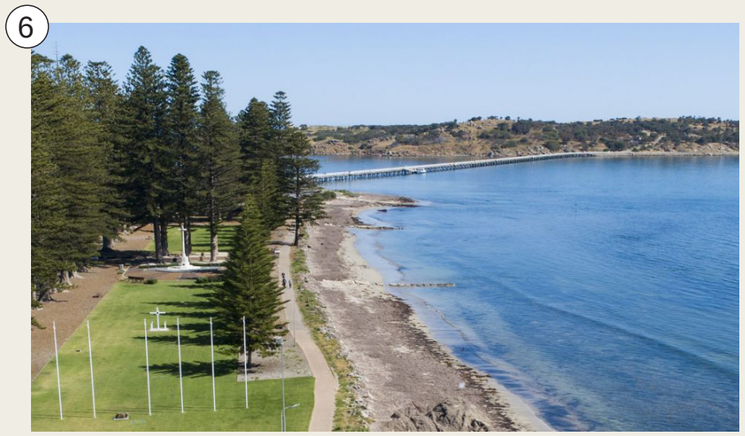
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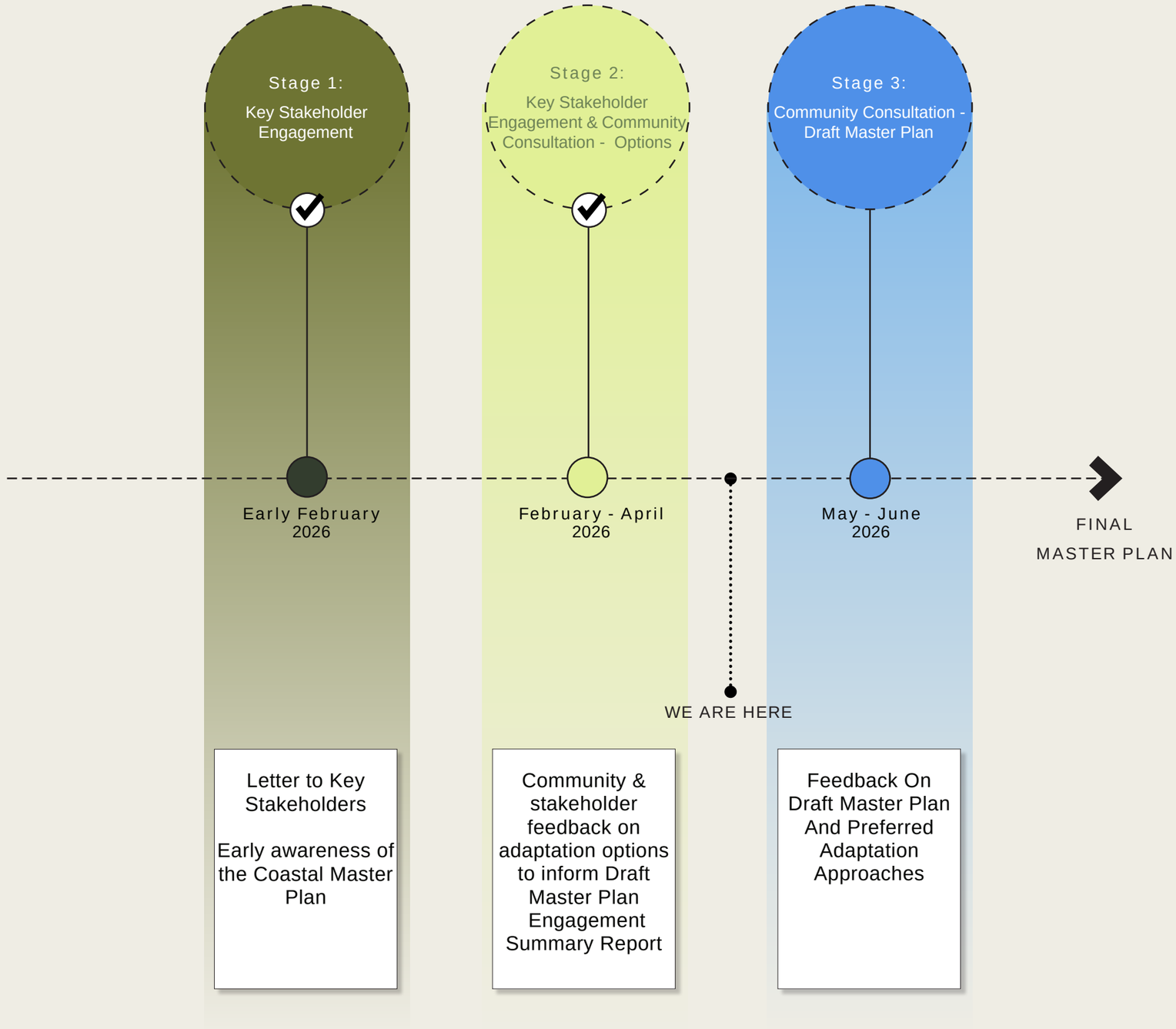


1	Coast snap app
2	3D printed artificial coral reefs
3	Citizen science for monitoring seasonal-scale beach erosion and behaviour with aerial drones
4	Living Shorelines Program - Ocean Watch Australia
5	Yilki Coastal Protection Works (Victor harbor, SA)
6	Living Shorelines Australia (sand nourishment) (Victor harbor, SA)

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Summary of Consultation Process

The community consultation & stakeholder engagement for the Master Plan will occur in three stages, with objectives & key activities as follows:



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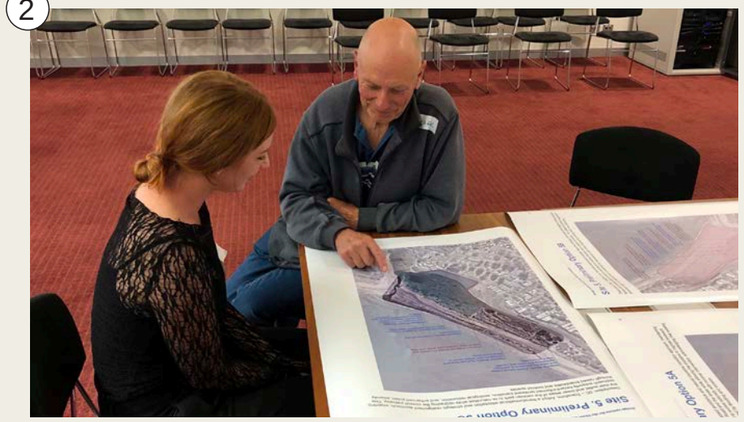
Summary of Consultation Process

Stage 2 consultation included a dedicated project webpage, fact sheet, survey, stakeholder meetings and promotion. Feedback from both the community and key stakeholders was largely aligned, showing a strong preference for a natural, transformative and holistic approach to adaptation, consistent with Council and project team directions, with only minor discrepancies noted between groups for site 2.

1



2



3



4



5



6



1	Information Session - Options
2	Information Session - Options
3	Subconsultant Team Workshop
4	Public signage for consultation
5	Subconsultant Team Site Visit & Walkover
6	Subconsultant Team Site Visit & Walkover

Summary of Community & Stakeholder Engagement

Stage 2 consultation highlighted generally consistent support for nature-based, holistic adaptation approaches across all sites, with some variation in priorities. At Sites 1, 4 and 5, there was strong preference to retain and enhance natural systems - such as dunes and estuary health - while transitioning away from hard infrastructure over time; Site 3 showed clear support for retaining existing community infrastructure and raising the seawall in the short term. At Site 2, while the broader community supported renaturalisation and revegetation, key stakeholders preferred to retain existing uses, representing the main point of divergence.

	Community Key Themes	Key Stakeholder Key Themes
Site 1	• Protect and work with natural estuary processes of river • Balance protection of key landscape assets with coastal change • Maintain access and amenity while planning for long-term change	• Predominant support for transformation and ecological restoration • Consistent advocacy for nature-based solutions • Secondary support for limited “hold the line” interventions
Site 2	• Strong value on recreation, activity and community identity • Support for transition toward a more natural and resilient coastline • Support for increased dunes and natural response	• Divergence between asset protection and transformation - yacht club + croquet club • Support for hybrid or staged adaptation pathways - yacht club supports continued operation of marine/recreation uses while incorporating retreat and dune restoration • Ongoing emphasis on nature-based outcomes
Site 3	• Protect civic, heritage and tourism assets • Maintain a high-quality public realm and coastal experience • Limited support for relocation of assets	• Strong consensus to protect existing assets (“hold the line”) • Limited stakeholder support for retreat or transformation • Secondary preference for integrating nature-based elements
Site 4	• Strong value on natural dune landscape and “living coast” character • Priority for dune restoration and coastal resilience • Reduce built form and reconfigure infrastructure over time	• Preference for a “transform” approach, but interest in retaining car park • Strong support for dune restoration and coastal processes • Reduce reliance on hard infrastructure over time
Site 5	• Strong support to restore and prioritise estuarine systems of river • Consider improving river systems • Accept change (including relocation) to enable long-term resilience	• Clear consensus toward full transformation • Priority on ecological restoration and system function • Acceptance of relocation and significant land-use change

02

Part 02 - Master Plan Concepts & Key Projects

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Guiding Principles - CHAP

These guiding principles are referencing the Coastal Hazard Adaptation Plan principles. The CHAP guiding principles establish the strategic foundation for coastal adaptation, focusing on risk management, resilience, and long-term environmental, social, and economic outcomes.

2. Avoid maladaptation
Ensure coastal hazard adaptation addresses one risk without creating another

4. Evidence-based
Draw upon the best available science, data, and information

6.Use local knowledge
Consider the perspectives of groups that value the marine and coastal environment, including Traditional Owners

1. Coastal resilience
Understanding and responding to values of the marine and coastal environments

3. Fit for purpose
Adaptation plans are appropriately scaled to address the place-based context of each part of the coast

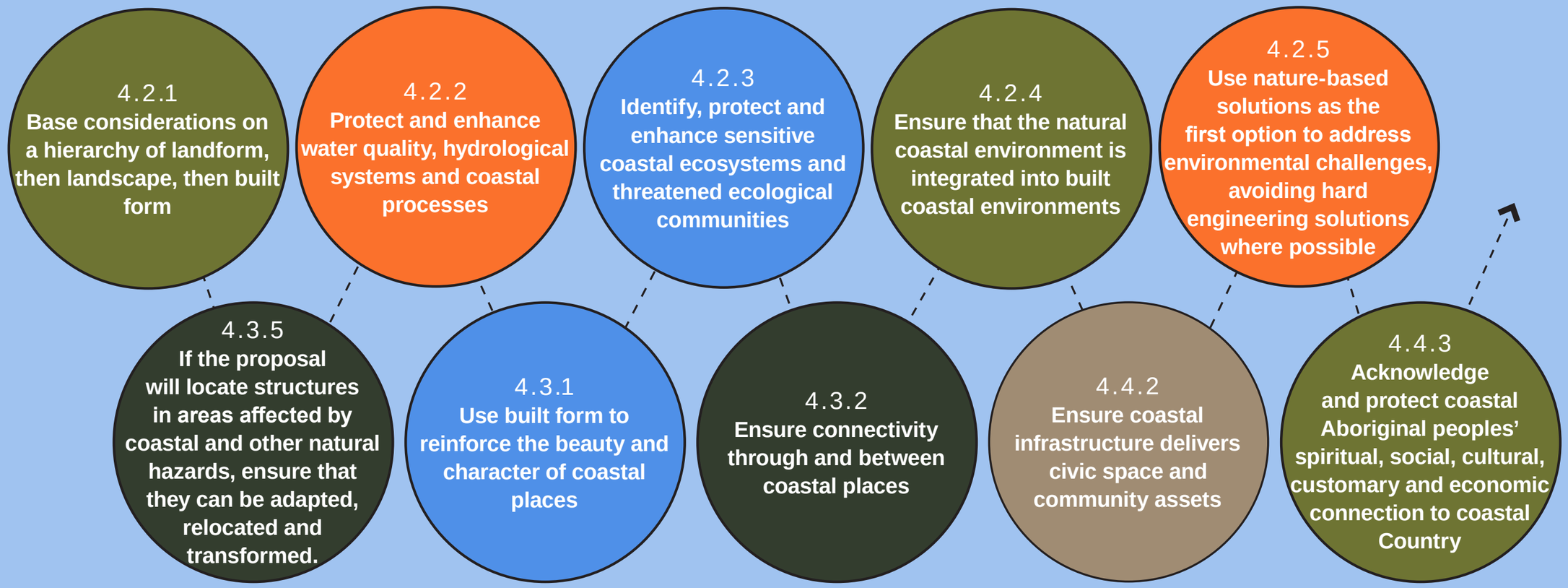
5. Collaborative approach
Coastal adaptation is complex, meaning it is best worked through with a range of stakeholders

7. Transparency
Share information associated with coastal hazard exposure and risk to support a culture of shared responsibility

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Guiding Principles - NSW Coastal Design Guidelines

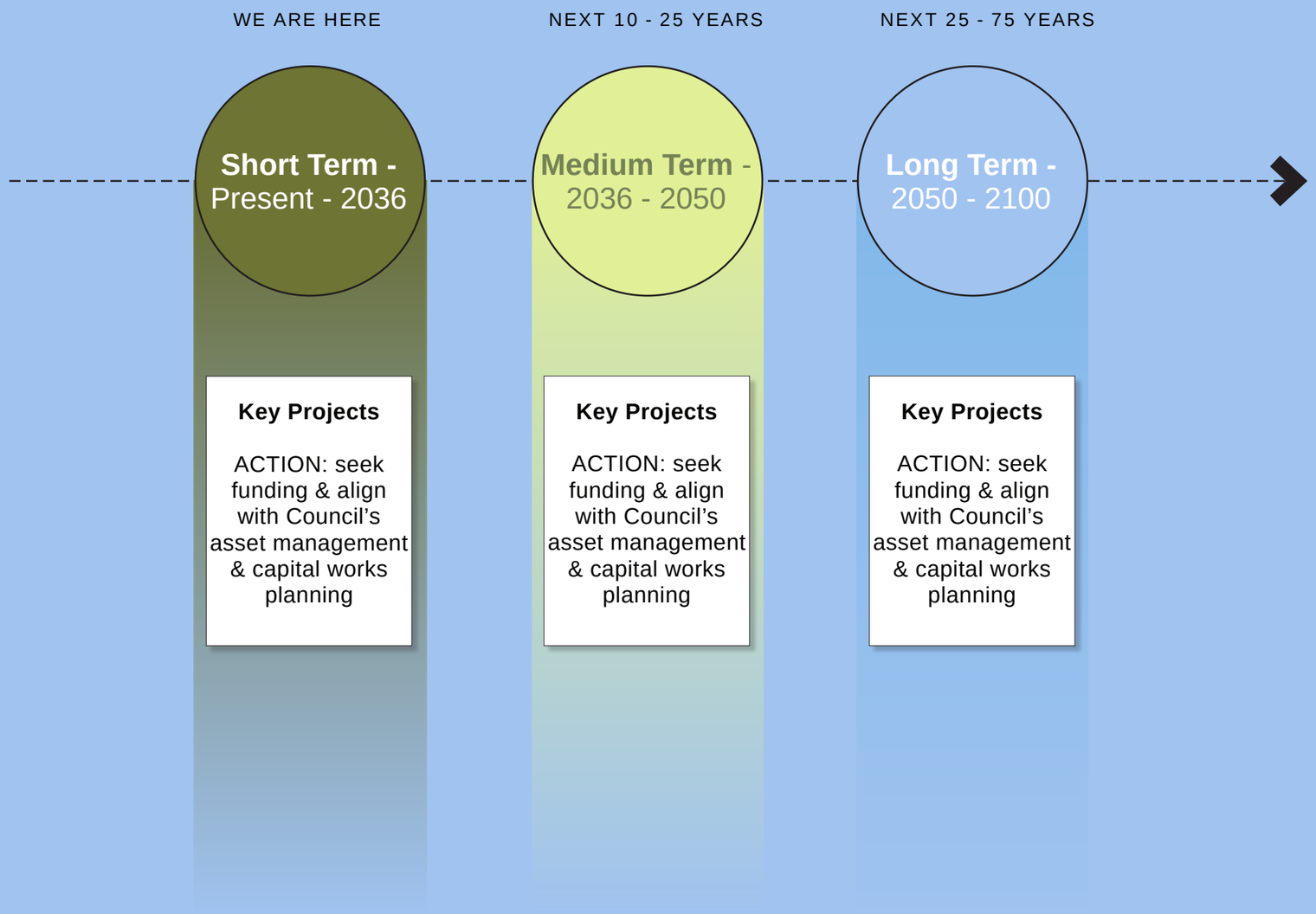
The NSW Coastal Design Guidelines principles provide a complementary urban design lens, translating these strategic directions into place-based design responses that shape how coastal environments are experienced, used, and integrated into the public realm.



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Timeframes, Priorities & Implementation

The Master Plan provides a practical and implementable framework for action, outlining short, medium, and long-term priorities. This will enable Council to seek funding and undertake capital works planning aligning with Council's asset management.



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Overall Site - Existing Character

Detailed site analysis has been undertaken to inform the approach to the Master Plan - see appendix. A holistic view should be taken when looking at the entire length of coast as it is a living, changing coast made up a series of connected systems relating to movement, infrastructure, environment & social use. For the purposes of the Master Plan, Cell 11 is divided into a finer grain of 5 x separate sites.

Legend

	Existing Stormwater Outlet
	Existing Tree
	Existing Rock revetment
	Existing Concrete Block Seawall
	Existing Sand Sausage & Sand Bags
	2024 Coastline
	Existing Bike Direct Network
	Existing Pedestrian Walkway
	Existing Road
	Existing Lawn
	Existing River
	Existing 1m Contour
	Existing Aboriginal Cultural Site - Kent Reserve
	Existing Beach
	Existing Car Park
	Existing Open Space
	Existing Understorey Planting
	Existing Water Body
	Existing Building
	Existing State Heritage Place
	Existing Local Heritage Place
	Existing Significant Environment Benefit Area
	Existing Recreational Space
1	Site Boundary

0 50 100 200 400 600m



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Overall Site - Existing Protection

1	Rock groyne & Sand bag extension (Hindmarsh River outlet)
2	Rock revetment (Beach Volleyball to Bowling Club)
3	Concrete blocks (Bowling Club frontage)
4	Rock revetment (Soldiers Memorial Gardens to Boat Ramp)
5	Concrete/ cement blocks (Causeway East)
6	Sand sausage & Sand bags (Wills Street and King Street)
7	Concrete blocks (King Street to Inman River)
8	Rock training wall (Inman River)

1



6



7



8



Legend

▪▪▪▪▪▪	Rock revetment
▬	Concrete block seawall
▬	Sand sausage & Sand bags
▭	Site boundary

Scale

0 50 100 200 400 600m



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Overall Site - Proposed Protection

Legend

	Stormwater Outlet
	Tree
	New Hybrid Seawall
	New Concrete Seawall
	Road
	Bike Direct Network
	Pedestrian Walkway
	1m Contour
	Aboriginal Cultural Site - Kent Reserve
	Beach
	Car Park
	Open Space
	Understorey Planting
	Sea
	Building
	State Heritage Place
	Local Heritage Place
	Significant Environment Benefit Area
1	Site Boundary

0 50 100 200 400 600m



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Site 01 - Short Term (Present - 2036)

CASS Summary

Historically stable shoreline with no pressing current issues. Erosion is the primary long-term risk (~60m retreat by 2100), placing the pine trees at risk without protection or eventual removal.

Community & Stakeholder Summary

1. **Protect and work with natural estuary processes**
2. **Balance protection of key landscape assets with coastal change**
3. **Maintain access and amenity while planning for long-term change**

Key Moves

1	**Short-term** - Do nothing in short term & allow natural processes to continue. Maintain functional beach in short-term & accept gradual loss of trees. Undertake sand nourishment, revegetation & fencing to protect dunes.
	Medium-term - Realign tree planting to Bridge Terrace.
	Medium-term - New boulevard for walking / cycling with upgraded public amenity including reconfiguration of car park and green spaces.
	Medium-term - New hybrid sea wall & sand nourishment to dunes.
	Medium-term - New boardwalk, trails & viewing decks.
	Medium-term - Protect and enhance the integrity of the estuary system through ecosystem-led adaptation such as wetlands / revegetation (river mouth re-naturalised).
	Medium-term - Stormwater outfall upgrades (in conjunction with WSUD / car park / sand nourishment).



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Site 01 - Medium Term (2036 - 2050)

CASS Summary

Historically stable shoreline with no pressing current issues. Erosion is the primary long-term risk (~60m retreat by 2100), placing the pine trees at risk without protection or eventual removal.

Community & Stakeholder Summary

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Key Moves

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3	**Medium-term** - New boulevard for walking / cycling with upgraded public amenity including reconfiguration of car park and green spaces.
4	**Medium-term** - New hybrid sea wall & sand nourishment to dunes.
5	**Medium-term** - New boardwalk, trails & viewing decks.
6	**Medium-term** - Protect and enhance the integrity of the estuary system through ecosystem-led adaptation such as wetlands / revegetation (river mouth re-naturalised).
7	**Medium-term** - Stormwater outfall upgrades (in conjunction with WSUD / car park / sand nourishment).



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Site 02 - Short Term (Present - 2036)

CASS Summary

Generally stable shoreline, though stormwater outlets and revetment interaction are contributing to localised erosion and beach lowering. Erosion and coastal flooding threaten narrow dunes and foreshore infrastructure. Without intervention: reduced beach width and routine flooding of 0.3–0.5m anticipated.

Community & Stakeholder Summary

1. **Strong value on recreation, activity and community identity**
2. **Support for transition toward a more natural and resilient coastline. Support for increased dunes and natural response**
3. **Divergence between asset protection and transformation. Yacht & croquet club supports continued operation of marine/recreation uses while incorporating retreat and dune restoration. Opportunity for hybrid or staged adaptation pathways**

Key Moves

1	**Short-term** - Explore relocation possibilities for the existing yacht club (ageing infrastructure - at end of useful life) & implement new relocated yacht club. NOTE: This requires sea wall / protection from rising sea levels.
2	**Short-term** - Explore relocation possibilities for the existing croquet club (ageing infrastructure) & re-vegetation and sand nourishment in its place. SEB location retained.
3	**Short-term** - Protect the heritage cafe (Qahwa) in current location from rising sea levels. New portion of hybrid seawall to protect Cafe (and removal of existing rock revetment).
	Medium-term - Explore relocation of Council assets, including skate park, tennis courts, beach volleyball - replace with soft recreation (e.g. playspace) & new hybrid sea wall with natural dune + revegetation.
	Medium-term - Coastal sand nourishment + revegetation.



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Site 02 - Medium Term (2036 - 2050)

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5	**Medium-term** - Coastal sand nourishment + revegetation.



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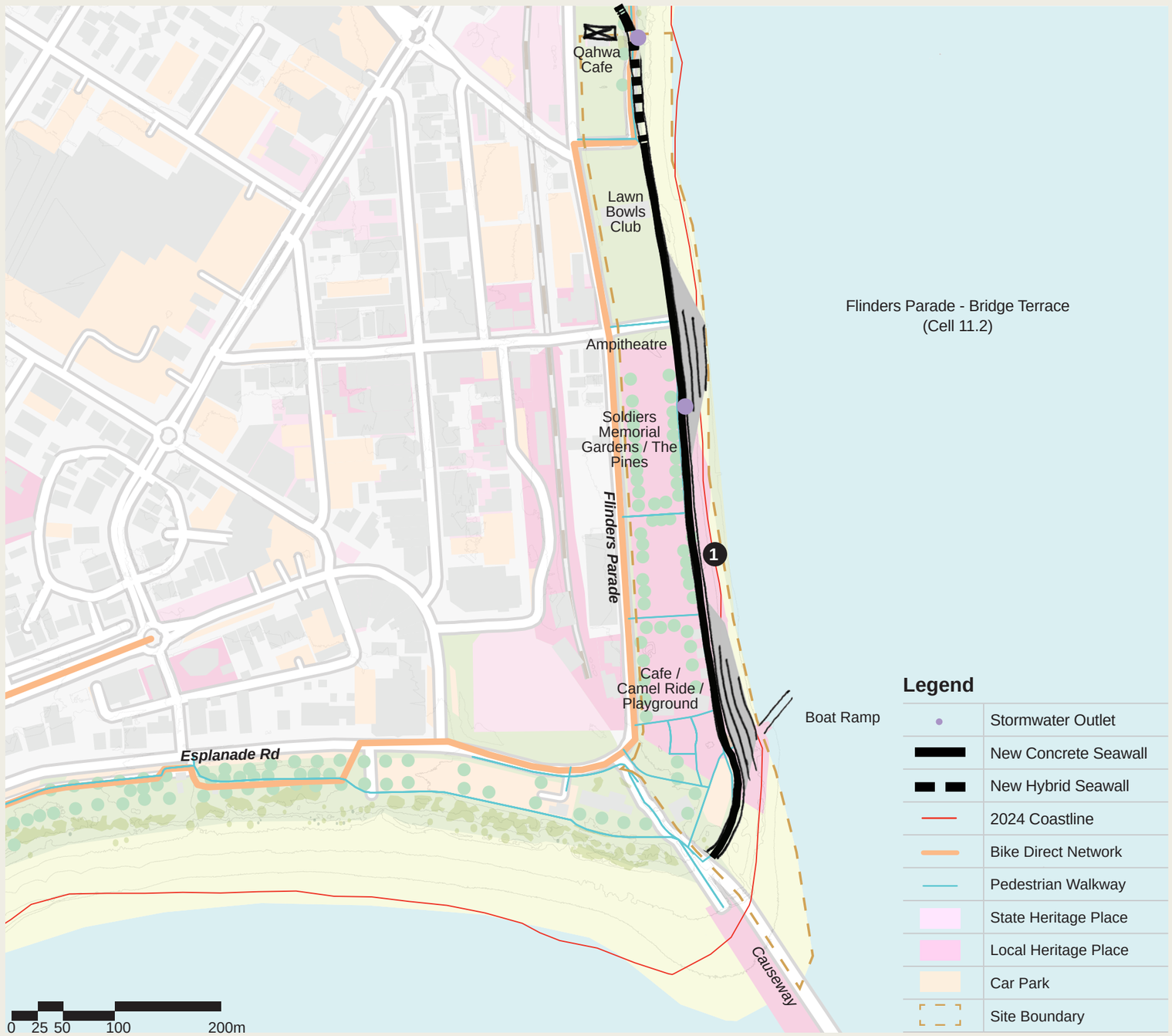
Site 03 - Short Term (Present - 2036)

CASS Summary

Most historically modified site with long-term “hold-the-line” approach and ongoing seawall issues. Beach lowering, overtopping and structural failures present ongoing maintenance and safety challenges. Coastal flooding is the greatest future risk, with promenade inundation (up to 0.5m) and minimal to no recreational beach width expected by 2100.

Community & Stakeholder Summary

1. **Protect civic, heritage and tourism assets**
2. **Maintain a high-quality public realm and coastal experience**
3. **Limited support for relocation of assets**



Key Moves

1	**Short-term** - Design & construct existing path into new raised seawall (1.5m higher). Existing concrete block wall removed. New seawall to be constructed from concrete with opporunties for terraces to beach.
	Medium-term - Stormwater outfall upgrades (in conjunction with WSUD / car park / sand nourishment). Explore relocation of boat ramp (impacted by sea levels in medium term).

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Site 03 - Medium Term (2036 - 2050)

CASS Summary

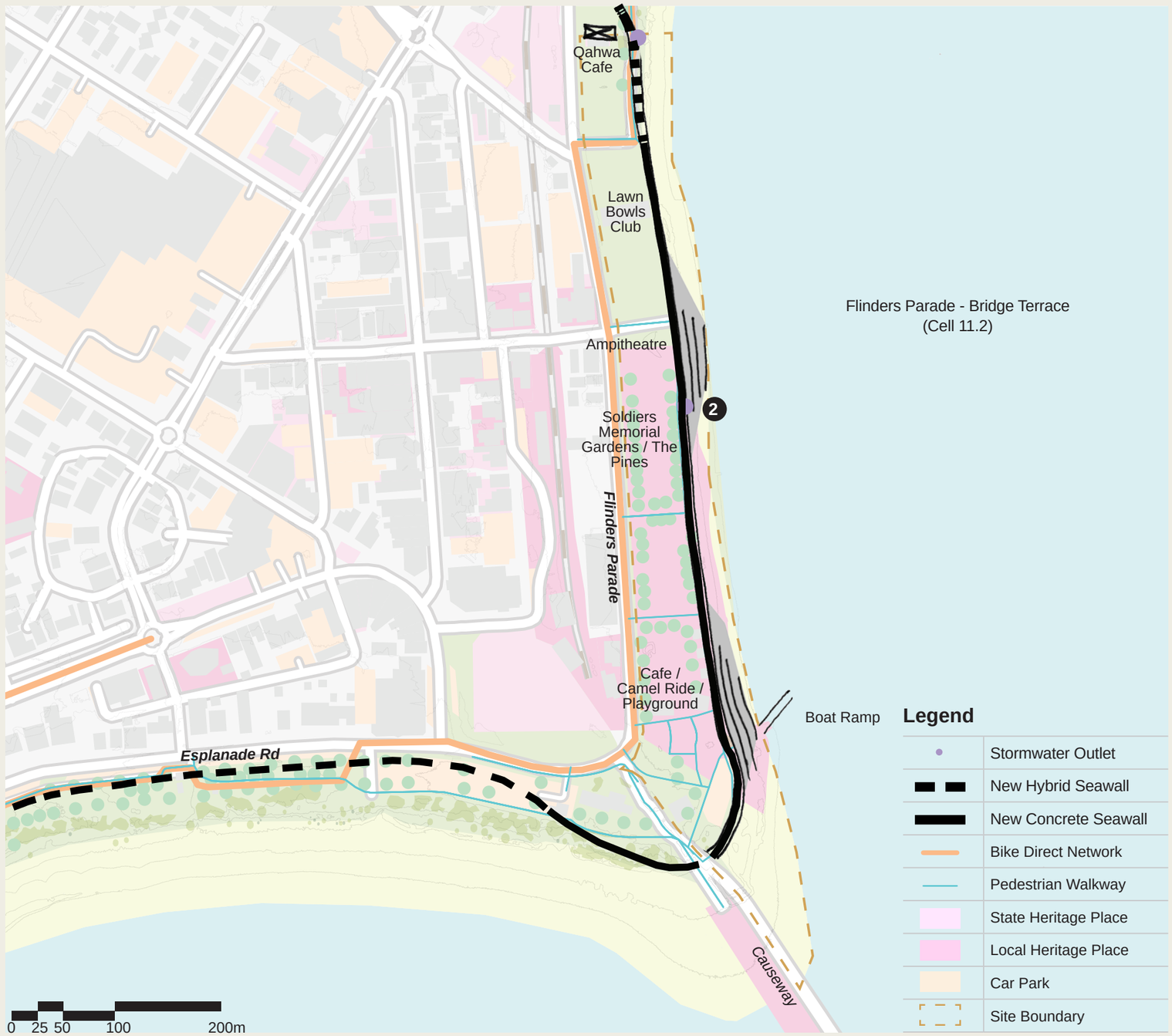
Most historically modified site with long-term “hold-the-line” approach and ongoing seawall issues. Beach lowering, overtopping and structural failures present ongoing maintenance and safety challenges. Coastal flooding is the greatest future risk, with promenade inundation (up to 0.5m) and minimal to no recreational beach width expected by 2100.

Community & Stakeholder Summary

1. **Protect civic, heritage and tourism assets**
2. **Maintain a high-quality public realm and coastal experience**
3. **Limited support for relocation of assets**

Key Moves

	Short-term - Design & construct existing path into new raised seawall (1.5m higher). Existing concrete block wall removed. New seawall to be constructed from concrete with opporunties for terraces to beach.
2	**Medium-term** - Stormwater outfall upgrades (in conjunction with WSUD / car park / sand nourishment). Explore relocation of boat ramp (impacted by sea levels in medium term).



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Site 04 - Short Term (Present - 2036)

CASS Summary

Stormwater outfalls are eroding dunes and creating erosion ingress points. Erosion is the primary risk (~50m dune retreat by 2100). CASS recommends dune nourishment, returning landscaped foreshore to natural veg/dune system, diverting stormwater.

Community & Stakeholder Summary

1. **Strong value on natural dune landscape and “living coast” character**
2. **Priority for dune restoration and coastal resilience**
3. **Reduce built form and reconfigure infrastructure over time**



Key Moves

1	**Short-term** - Explore relocation of car park elsewhere & explore staged removal and relocation.
2	**Short-term** - Explore relocation of car park with dunes including revegetation & sand nourishment, remove existing terraced concrete blocks.
	Medium-term - Stormwater outfall upgrades (in conjunction with sand nourishment). Consolidate dune into one consistent dune.
	Medium-term - New boulevard for walking / cycling with upgraded public amenity including reconfiguration of car park and green spaces. New hybrid sea wall.

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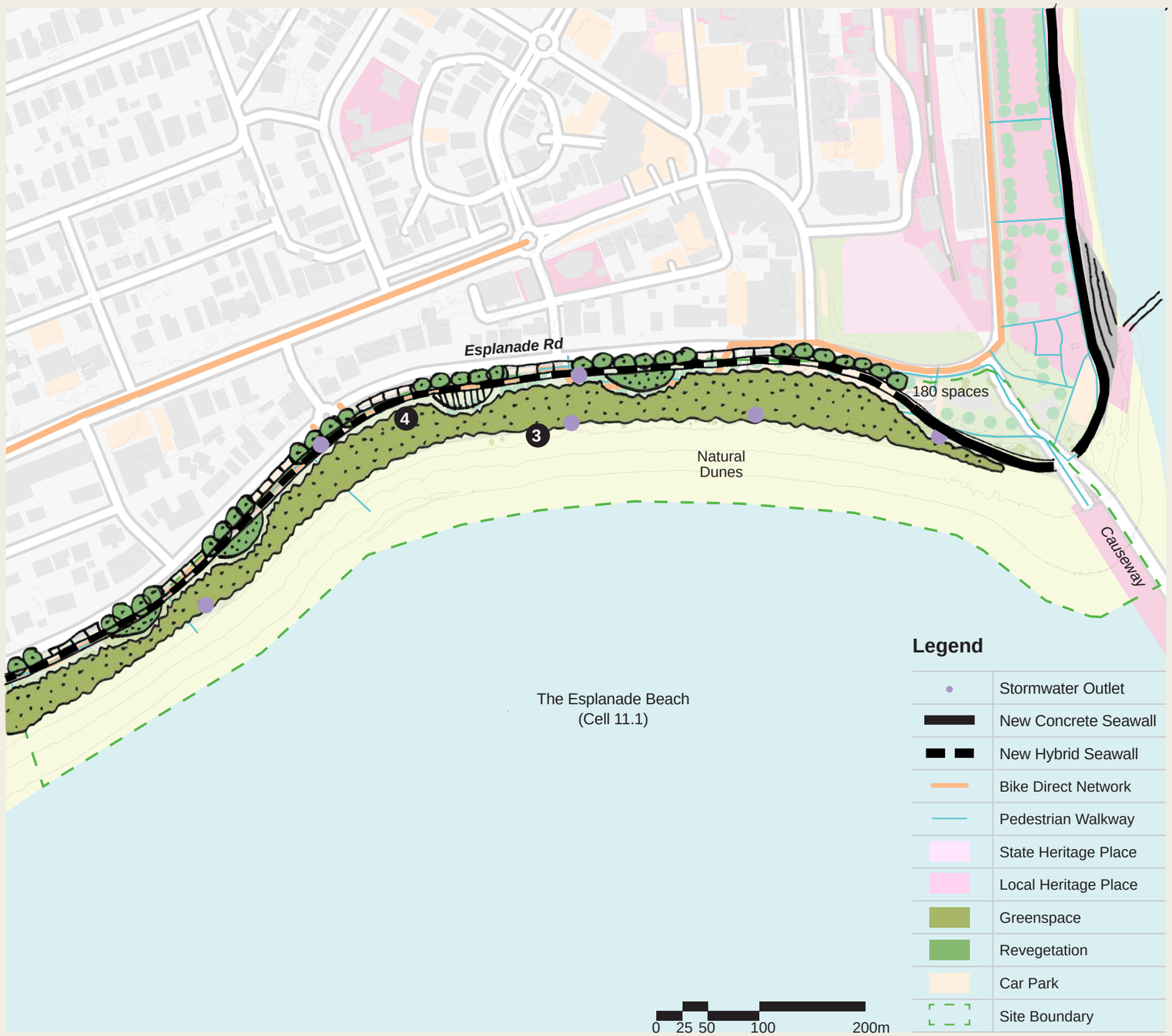
Site 04 - Medium Term (2036 - 2050)

CASS Summary

Stormwater outfalls are eroding dunes and creating erosion ingress points. Erosion is the primary risk (~50m dune retreat by 2100). CASS recommends dune nourishment, returning landscaped foreshore to natural veg/dune system, diverting stormwater.

Community & Stakeholder Summary

1. **Strong value on natural dune landscape and “living coast” character**
2. **Priority for dune restoration and coastal resilience**
3. **Reduce built form and reconfigure infrastructure over time**



Key Moves

	Short-term - Explore relocation of car park elsewhere & explore staged removal and relocation.
	Short-term - Explore relocation of car park with dunes including revegetation & sand nourishment, remove existing terraced concrete blocks.
3	**Medium-term** - Stormwater outfall upgrades (in conjunction with sand nourishment). Consolidate dune into one consistent dune.
4	**Medium-term** - New boulevard for walking / cycling with upgraded public amenity including reconfiguration of car park and green spaces. New hybrid sea wall.

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Site 05 - Short Term (Present - 2036)

CASS Summary

Primary issue is coastal flooding risk to the caravan park during storm surge events. Sea level rise will increase flood frequency; erosion also anticipated (~50m potential retreat by 2100).

Community & Stakeholder Summary

1. **Strong support to restore and prioritise estuarine systems of river**
2. **Consider working with natural processes**
3. **Accept change (including relocation) to enable long-term resilience**



Key Moves

1	**Short-term** - Plan for improvements to estuary including re-establishing wetlands & re-vegetation (in lieu of levee).
2	**Short-term** - New boardwalk, with trail & viewing deck (to wetland & Kent Reserve).
	Medium-term - Stormwater outfall upgrades (in conjunction with sand nourishment). Consolidate dune into one consistent dune.
	Medium-term - New boulevard for walking / cycling with upgraded public amenity including reconfiguration of car park and green spaces. New hybrid sea wall.

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Site 05 - Medium Term (2036 - 2050)

CASS Summary

Primary issue is coastal flooding risk to the caravan park during storm surge events. Sea level rise will increase flood frequency; erosion also anticipated (~50m potential retreat by 2100).

Community & Stakeholder Summary

1. **Strong support to restore and prioritise estuarine systems of river**
2. **Consider working with natural processes**
3. **Accept change (including relocation) to enable long-term resilience**



Key Moves

	Short-term - Plan for improvements to estuary including re-establishing wetlands & re-vegetation (in lieu of levee).
	Short-term - New boardwalk, with trail & viewing deck (to wetland & Kent Reserve).
3	**Medium-term** - Stormwater outfall upgrades (in conjunction with sand nourishment). Consolidate dune into one consistent dune.
4	**Medium-term** - New boulevard for walking / cycling with upgraded public amenity including reconfiguration of car park and green spaces. New hybrid sea wall.

Timeframes, Priorities & Implementation

	Short Term - Present - 2036	**Medium Term** - 2036 - 2050	**Long Term** - 2050 - 2100
Site 1	• Do nothing in short term & allow natural processes to continue. Maintain functional beach in short-term & accept gradual loss of trees. Undertake sand nourishment, revegetation & fencing to protect dunes.	• Realign tree planting to Bridge Terrace. • New boulevard for walking / cycling with upgraded public amenity including reconfiguration of car park and green spaces. • New hybrid sea wall & sand nourishment to dunes. • New boardwalk, trails & viewing decks. • Protect and enhance the integrity of the estuary system through ecosystem-led adaptation such as wetlands / revegetation (river mouth re-naturalised). • Stormwater outfall upgrades (in conjunction with WSUD / car park / sand nourishment).	• Optional - plan & implement strategy based on CHAP mitigating impacts of coastal erosion and flooding on Bridge Terrace.
Site 2	• Explore relocation possibilities for the existing yacht club (ageing infrastructure - at end of useful life) & implement new relocated yacht club. NOTE: This requires sea wall / protection from rising sea levels. • Explore relocation possibilities for the existing croquet club (ageing infrastructure) & re-vegetation and sand nourishment in its place. SEB location retained. • Protect the heritage cafe (Qahwa) in current location from rising sea levels. New portion of hybrid seawall to protect Cafe (and removal of existing rock revetment).	• Explore relocation of Council assets, including skate park, tennis courts, beach volleyball - replace with soft recreation (e.g. playspace) & new hybrid sea wall with natural dune + revegetation. • Coastal sand nourishment + revegetation.	• Optional - plan & implement strategy based on CHAP mitigating impacts of coastal erosion and flooding on Bridge Terrace.
Site 3	• Design & construct existing path into new raised seawall (1.5m higher). Existing concrete block wall removed. New seawall to be constructed from concrete with opportunites for terraces to beach.	• Stormwater outfall upgrades (in conjunction with WSUD / car park / sand nourishment). Explore relocation of boat ramp (impacted by sea levels in medium term).	• NIL - Flinders Parade protected.
Site 4	• Explore relocation of car park elsewhere & explore staged removal and relocation. • Explore relocation of car park with dunes including revegetation & sand nourishment, remove existing terraced concrete blocks.	• Stormwater outfall upgrades (in conjunction with WSUD / car park / sand nourishment). • New boulevard for walking / cycling with upgraded public amenity including reconfiguration of car park and green spaces. New hybrid sea wall.	• Optional - plan & implement strategy based on CHAP mitigating impacts of coastal erosion and flooding on Bridge Terrace.
Site 5	• Plan for improvements to estuary including re-establishing wetlands & re-vegetation (in lieu of levee). • New boardwalk, with trail & viewing deck (to wetland & Kent Reserve).	• Stormwater outfall upgrades (in conjunction with sand nourishment). Consolidate dune into one consistent dune. • New boulevard for walking / cycling with upgraded public amenity including reconfiguration of car park and green spaces. New hybrid sea wall.	• Optional - plan & implement strategy based on CHAP mitigating impacts of coastal erosion and flooding on Bridge Terrace.

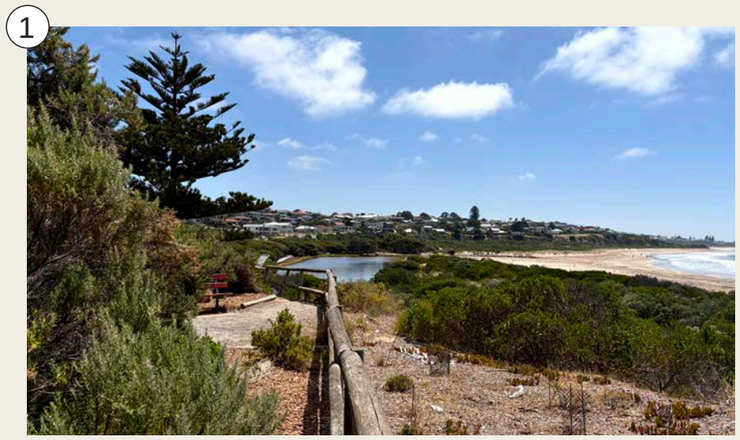
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Part 03 - Appendix

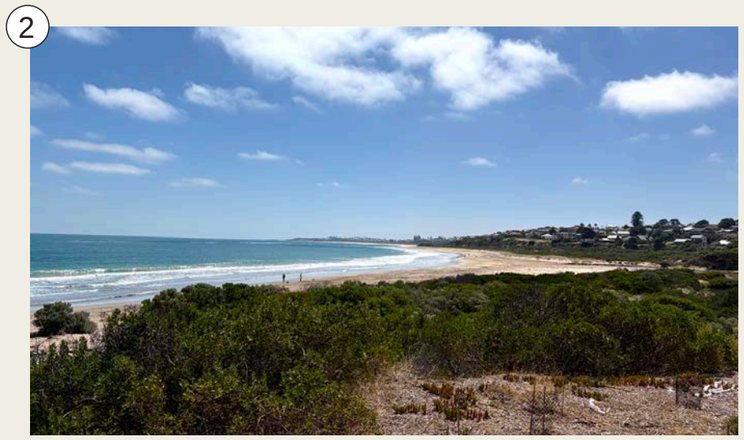
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Site Analysis

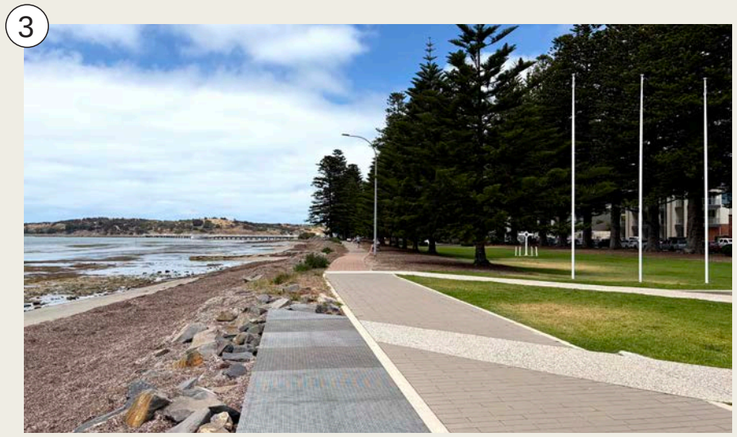
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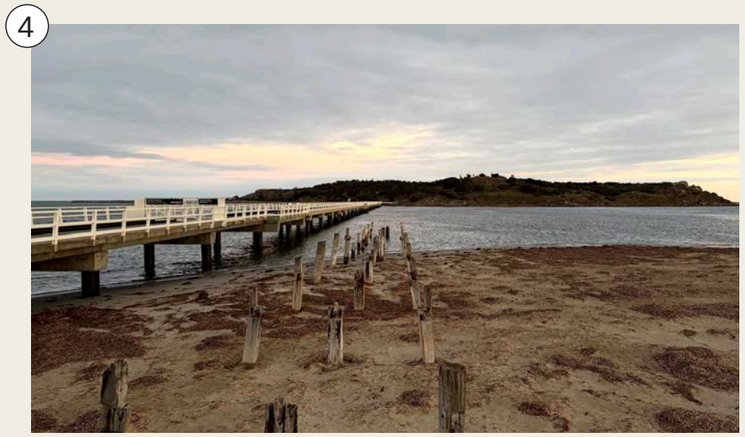
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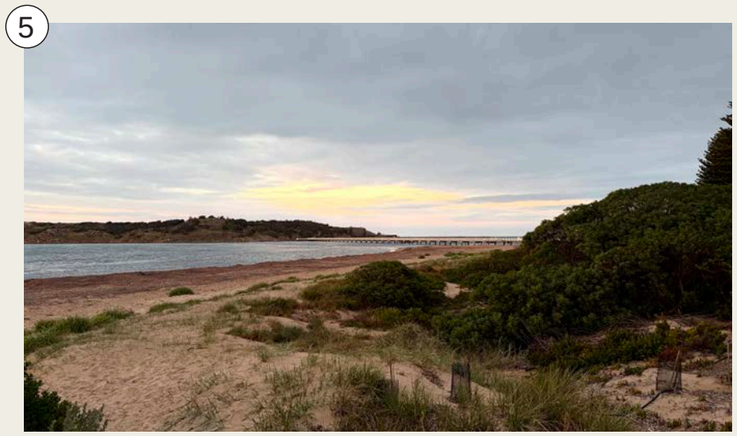
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4



5



6



1	Hindmarsh River (Latung) / Bridge Point
2	Hindmarsh River (Latung) / Bridge Point
3	Ampitheatre / Soldiers Memorial Gardens / The Pines
4	The Causeway / Granite Island
5	Granite Island / Esplanade Dunes
6	Inman River (Muwerangi) / Caravan Park

Site Analysis - A Living Coastline

Digital Earth Australia (DEA) Coastlines has been sourced to provide insight into the shoreline recession and accretion potential at Victor Harbor.

The DEA Coastlines map records the change in coastline at the water level (nearshore zone). The map combines satellite data from Geoscience Australia with tidal modelling to map the typical (representative) location of the shoreline at mean sea level for each year from 1988 to present. This allows for trends of coastal recession (retreat) or accretion (growth) to be examined, and for patterns of change to be mapped historically.

DEA Coastlines does not record levels or changes to the back-shore (e.g., dunes, seawalls at the back of the beach). The map summarises the median (most dominant) position of the shoreline through the entire year, and will therefore not reflect shorter-term variability, such as changes in shoreline between low and high tide, seasonal effects, or short-lived influences of individual storms.

Comparison of the 1988 and 2024 shoreline from DEA Coastlines shows areas of shoreline growth (accretion) at the Inman and Hindmarsh River mouths. River outlets are often very dynamic shorelines subject to both coastal and fluvial (river-based) processes.

The eastern end of the Esplanade Beach is also shown to have accreted. Sediment transport in this southern area is typically towards the north-east, where the sediment is partially blocked by the Police Point sand spit at the Causeway.

No change to the shoreline north of the Causeway can be seen. This is due to the hard infrastructure (seawalls, playing fields) along this stretch of coast holding the shoreline in place.



Legend

	1988 Coastline
	2024 Coastline
	Site boundary

Scale

0 50 100 200 400 600m

Site Analysis - Movement & Circulation

The site is part of a broader movement network for pedestrians walking, cycling and driving. There is also consideration to be given to beach & river access such as boat ramps, trails & boardwalks. The Steam Ranger railway corridor traverses the cell, occupying portions of the landward edge of the coastal dunes and contributing to both the character and constraints of the precinct.



Legend

	Pedestrian walkway
	Bike direct network
	Road
	Site boundary
	Car park

Scale

0 50 100 200 400 600m

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Site Analysis - Flood Mapping

The Coastal Flood Mapping Viewer has used a simple bathtub modelling method to map six sea level rise scenarios across South Australia. Two of the sea level rise scenarios are shown in the figure to the right. A bathtub modelling method assumes that all areas at or below a given flood level for a scenario are considered flooded. This provides a simple visualisation of areas at risk of coastal or of possible groundwater flooding from rising water tables as a result of sea level rise.

The modelling does not consider connectivity to the ocean, the complex hydrodynamics of real-world flooding, flooding pathways, or changes to the landscape over time (e.g., erosion). Bathtub modelling also does not indicate the duration of flooding, but rather identifies areas that are likely to flood under the modelled event. The figure to the right shows the coastal flood hazard at Victor Harbor for a Mean High Water Spring (MHWS) flood event in the year 2050 and 2100.

The MHWS flood event in 2020 (not pictured) was sourced from the Tide Tables for SA Ports. In accordance with South Australian Coastal Protection Board Policy, a +0.3 m sea level rise allowance to 2050 is added to this 2020 value. A +1 m sea level rise allowance to 2100 is added. The flood mapping for the MHWS flood event in 2050 and 2100 shows flood risk to land adjacent the Inman and Hindmarsh Rivers.



Legend

	2020 MHWS = 0.58 m AHD
	2050 MHWS = 0.88 m AHD
	2100 MHWS = 1.58 m AHD
	1m contour
	Site boundary

Scale

0 50 100 200 400 600m

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Site Analysis - Storm Surge

The Coastal Flood Mapping Viewer has used a simple bathtub modelling method to map six sea level rise scenarios across South Australia. One of the sea level rise scenarios are shown in the figure to the right. The figure to the right shows the 1% Annual Exceedance Probability (AEP) storm surge flood event in the year 2100.

A 1% AEP event is an event that has a probability of occurring once in any given year. A storm surge includes the contribution of astronomical tide and atmospheric storm effects (e.g., high wind speeds, low atmospheric pressure) on water levels.

The 1% AEP storm surge flood event in 2020 (not pictured) was sourced from a database of estimated storm surge values based on existing historical tidal records and observations following significant storm events in South Australia managed by the Department for Environment and Water Coast Unit. In accordance with South Australian Coastal Protection Board Policy, a +1 m sea level rise allowance to 2100 is added to the 2020 value.

The flood mapping for the 1% AEP storm surge flood event in 2100 shows a very high risk to land adjacent the Inman and Hindmarsh Rivers. The eastern shoreline (north of the causeway) is also under very high risk with flooding of the foreshore to Flinders Parade/Bridge Tce predicted by the modelling.



Legend

	1% Annual Exceedance Probability (AEP) Storm Surge 2100
	1m Contour
	Site boundary

Scale

0 50 100 200 400 600m

Site Analysis - State, Local & Cultural Heritage

This dataset is defined as a collection of clearly bounded places with outstanding natural or cultural elements that are important to the state's development, identity, and distinctive sense of place. It includes heritage areas recognised under the South Australian Heritage Act 1978 and authorised under the Development Act 1993.

Key Items

1	Local heritage place - Hindmarsh River Railway Bridge & State heritage place - New Alexandra Bridge
2	Local heritage place - Qahwa Cafe & Tennis Clubhouse
3	State heritage place - Soldiers Memorial Gardens
4	State heritage place - Granite Island Causeway
5	Cultural heritage place - Kent Reserve

Legend

	State heritage place
	Local heritage place
	Cultural heritage
	Significant environment benefit area
	Site boundary

Scale

0 50 100 200 400 600m



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Site Analysis - Recreation

The narrow coastal reserves are a major recreational resource for residents and visitors. The area experiences large fluctuations in population due to the visitation from tourists throughout the year (summer and winter). There is land-based and sea-based activities functioning from the foreshore including lawn areas, Memorial Gardens and the beach itself. Current tenants include croquet, skate park, playgrounds, basketball, beach volleyball, tennis & bowling. The area between the caravan park, the Inman River and foreshore is significant and highly visible piece of coastal open space.

Ecotourism from penguin tours and boat trips from the causeway visiting local nearshore marine waters and offshore island operate seasonally. The cell is utilised for recreational fishing, diving, boating, swimming and walking. The beach is used for launching boats in several locations. Some of the reefs are recognised fishing and diving sites, including 'Whalebones' - a reef system that is a recognised recreational diving site.

Key Items

1	Victor Harbor Croquet Club
2	Victor Harbor Skate Park
3	Bridge Terrace Playground
4	Basketball
5	Fleurieu Beach Volleyball
6	Tennis Court
7	Victor Harbor Bowling Club
8	G T Fisher Playground
9	Open Lawn & Norfolk Pine Trees
10	Soldiers Memorial Gardens
11	Pocket Parks & Open Lawn

Legend

	2024 Coastline
	Recreational space
	Beach
	Site boundary

Scale

0 50 100 200 400 600m



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Site Analysis - Land Vegetation

The land vegetation in the Victor Harbor area includes coastal dunes, estuaries, and shrublands, which support diverse native flora and fauna. Key vegetation communities include coastal shrublands, swamp paper-bark forests, and eucalyptus woodlands. These habitats are home to conservation-significant species like Hooded Plover, Black-chinned Honeyeater, and Swamp Paper-bark. However, the area faces threats from urbanization, invasive weeds, erosion, and climate change. Restoration efforts, weed control, and community education are critical for preserving biodiversity and maintaining ecological balance.



Key Items

1	Norfolk Island Pine Trees & Open Lawn
2	Norfolk Island Pine Trees & Open Lawn (The Pines)
3	Pocket Parks & Open Lawn

Legend

	Tree
	Lawn
	Green Space
	Understorey Planting
	Site boundary

Scale

0 50 100 200 400 600m

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Site Analysis - Protected Vegetation

Native Vegetation Floristic Areas – Pre-European Settlement – Agricultural Region
This dataset identifies the floristic composition and general structural characteristics of native vegetation communities believed to have existed before European settlement in 1836.

Native Vegetation Floristic Areas – NVIS – Statewide
This dataset provides floristic and structural information on vegetation types, as well as the presence and spatial distribution of native vegetation across the state.

Vegetation ID

SM0203	Brown Stringybark woodland over tall shrubs and low shrubs.
SM0601	Swamp paperbark low closed forest over tall sedges and low forbs
SM1201	River red gum mid woodland over golden wattle low trees and mid tussock grasses.
AP0023PE	Samphire understorey / saline-edge vegetation dominated by *Sarcocornia quinqueflora* and *Tecticornia spp*.; associated with low-lying saline depressions and saltmarsh margins.
AP0024PE	Coastal shrubland dominated by *Olearia axillaris* and *Leucopogon parviflorus*, typical of coastal dune and near-shore environments.
MN0017PE	Low woodland dominated by *Allocasuarina verticillata*; used in South Australian native plant lists and associated with grassy/ herbaceous understorey in Lower Lakes / Southeast settings.

Key Items

1	Samphire understorey / saline-edge vegetation dominated by *Sarcocornia quinqueflora* and *Tecticornia spp*.; associated with low-lying saline depressions and saltmarsh margins.
2	Swamp paperbark low closed forest over tall sedges and low forbs.
3	Significant Environment Benefit Area (SEB) - Hooded Plover

Legend

	Native vegetation floristic areas
	Pre european vegetation
	Site boundary

Scale
0 50 100 200 400 600m



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Site Analysis - River & Ocean Flora

The precinct supports a diverse range of coastal and marine habitats, including estuarine systems, dunes, reefs, and seagrass meadows, which underpin significant biodiversity and recreational fishing values. These environments provide habitat for species such as Southern Garfish and King George Whiting, and support offshore reef systems used for fishing and diving, including sites around Granite Island.

Granite Island Recreation Park is a popular recreation site with known locations to view the Little Penguins (*Eudyptula minor novaehollandiae*).

The offshore reefs are important habitat and recreational fishing areas for Southern rock lobster (*Jasus edwardsii*) and various fish species. Bryars (2013) describes the inshore beaches, seagrasses and reefs are important habitat and recreational fishing areas for species such as Southern Garfish (*Hyporhamphus melanochir*) and King George Whiting (*Sillaginodes punctatus*).

Granite Island and Seal Island are managed by National Parks, with surrounding waters forming part of the Encounter Marine Park. A 1.8-hectare area within the Hindmarsh River mid-estuary is designated as a Significant Environmental Benefit Area, protected under the Native Vegetation Act 1991.



Legend

	Site boundary
	Supratidal melaleuca
	Supratidal/ Estuarine flat
	Estuarine sedges
	Unconsolidated bare substrate
	Low Profile Reef - Continuous
	Low Profile Reef - Patchy
	Seagrass - Continuous
	Seagrass - Patchy

Scale

0 50 100 200 400 600m

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Site Analysis - Stormwater Outfalls

Stormwater outlets that exit onto the beach cause issues of erosion and localised beach scour. Water exiting the outlets erodes the beach face and lowers the beach levels. During high tide or storm events, this can result in seawater ingress and exacerbated erosion from coastal processes.



Legend

●	Stormwater outlet
▭	Site boundary

Scale

0 50 100 200 400 600m

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Site Analysis - Fauna

This map is based on 912 fauna sighting records from the Victor Harbor area between 2020 and 2026. The data are primarily derived from georeferenced observations from iNaturalist Australia and cover 219 species in total. As a result, the distribution shown on the map reflects not only areas of concentrated animal activity, but also the spatial density and reporting preferences of citizen science observations.

Records from 2020 to 2026 are dominated by birds, with 713 records representing approximately 84 species, including Silver Gull, Pacific Gull, New Holland Honeyeater, Singing Honeyeater, and Australian Magpie. Insects and fish are the next most frequently recorded groups, while smaller numbers of molluscs, sharks, cephalopods, crustaceans, reptiles, and other marine invertebrates were also documented.

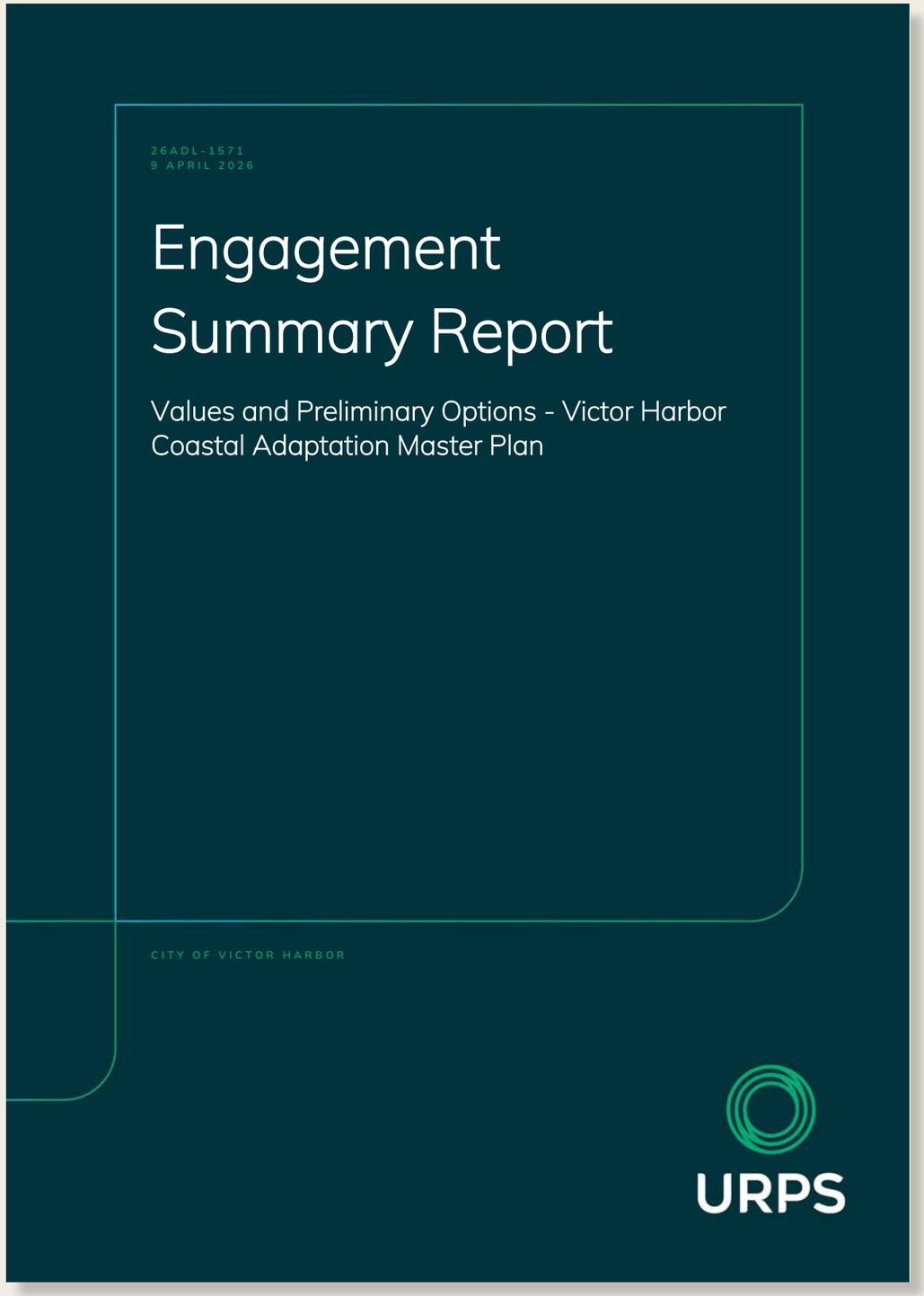


Legend

●	Animal witness 2020-2026 (In Site)
○	Animal witness 2020-2026
—	2024 Coastline
	Beach
▭	Site boundary

Scale

0 50 100 200 400 600m



Engagement Summary Report

9 April 2026

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V2	31/03/26	Z. Hambour	E. Mansfield	Updates from JPE review
V3	09/04/26	Z. Hambour		Update about NAC April Board meeting

We acknowledge the Kaurna people as the Traditional Custodians of the land on which we work and pay respect to their Elders past, present and emerging.

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Snapshot

Consultation on the Victor Harbor Coastal Adaptation Master Plan was undertaken from Thursday 26 February until Sunday 22 March 2026.

The aim of the consultation was to gather stakeholder and community feedback on the proposed coastal adaptation preliminary options to respond to increasing coastal erosion and inundation for five sites along the Victor Harbor foreshore between the Hindmarsh and Inman Rivers.

Consultation was undertaken through a community survey (27 responses) and key stakeholder meetings (9 meetings). Two stakeholders chose to provide a letter of feedback to Council.

Preliminary options preferred by survey respondents are summarised in the below table. It is important to note that given the response rate of the survey, this may not be indicative of the views of the wider community.

Site	**Preferred option for survey respondents** (based on combined support and strongly support responses)
Site 1 - Hindmarsh River Estuary / Bridge Point	Option 1b Hold the Line
Site 2 - Croquet Club / Skate Park / Tennis Courts	Option 2c Transform (Noting that Option 2a Hold the Line and Managed Retreat had the same level of combined support, but Option 2c Transform received a greater number of strongly support responses)
Site 3 - Flinders Parade / Heritage Cafe / Lawn Bowls / Soldiers Memorial Garden	Option 3b Hold the Line
Site 4 - Esplanade Beach Dunes	Option 4b Hold the Line (Noting that Option 4b Hold the Line received the highest level of combined support and strongly support responses, but Option 4c Transform received a larger number of strongly support responses)
Site 5 - Inman River Estuary & Caravan Park	Option 5c Transform

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Preliminary options preferred by key stakeholders are summarised in the table below. These preferred options were directly identified by stakeholders.

	Preferred option for each site (as identified by stakeholders)				
Group	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Biodiversity Victor Harbor	Option 1C Transform	-	Option 3B Hold the Line	Option 4B or combination of Option 4B Hold the Line and 4C Transform	Option 5C Transform
Victor Harbor Yacht Club	-	Option 2B Hold the Line and Managed Retreat and Dune Restoration	-	-	-
Victor Harbor Coast Care	Option 1B Hold the Line or 1C Transform	Option 2C Transform	Option 3B Hold the Line	Combination of Option 4B Hold the Line and 4C Transform then Option 4C	Option 5C Transform
Landscapes Hills & Fleurieu	General preference for nature-based solutions to be prioritised.				
Victor Harbor Bowls Club	Environmental option	-	Option 3B Hold the Line	-	-
Fleurieu beach volleyball / tennis courts / cafe	-	-	Option 3B Hold the Line	-	-
Horse Drawn Tram	-	-	Option 3B Hold the Line	Option 4B Hold the Line	-
Victor Harbor Croquet Club	-	Seawall	-	-	-
Birdlife Australia	Option C Transform, where this protects bird habitat				

More detail about the respondents, their preferred options and their associated commentary is provided in the body of this Engagement Summary Report.

1. Why did we engage?

The City of Victor Harbor is preparing a Coastal Adaptation Master Plan for the section of coast between Hindmarsh and Inman Rivers to manage the projected long term impacts of coastal erosion and flooding.

This engagement provided the opportunity for the community to provided feedback on preliminary technically effective design options and to share what they value about the section of the coast or how they think it could be improved.

1.1 Background

The Victor Harbor foreshore between Hindmarsh and Inman Rivers is a stretch of living coast cherished as a valued public place and active natural system.

Like most coastal areas around Australia, our foreshore is at risk of coastal erosion and flooding from projected sea level rise and increasing storm frequency associated with climate change.

Design, engineering and environmental planning are coming together to prepare a Master Plan for the foreshore. It will identify a layout that manages coastal risks whilst providing places for people, nature and the ongoing natural processes that shape our dynamic coastline.

Preparation of the Master Plan is an action from Council's Coastal Adaptation Study and Strategy (CASS) and is being funded through a Coastal Hazard Adaptation Grant from the Local Government Association of South Australia.

The CASS projected that by 2100, if nothing is done, parts of the foreshore could erode by 60 metres, and some areas could flood from coastal storm surges three times a month.

Coastal engineers and scientists identified preliminary technically effective options for managing the projected coastal erosion and flooding impacts. Landscape architects provided input on how these options can consider people and place, providing opportunities to enhance, protect and preserve it for years to come, while creating new places and amenity for the community.

This consultation sought community feedback on preliminary technically effective options for managing the projected coastal erosion and flooding impacts that have been identified by consultants.

Council has not formed a view on these options and before preparing the draft Master Plan, wants to understand the community's views, what people value most about the foreshore, and any ideas they have for improving it.

Future decisions will be informed by community views, effectiveness, cost and social and environmental impacts.

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1.2 Master Plan area and sites

The Master Plan area was divided into 5 sites. Preliminary options were identified for each. Consultation asked for feedback on each site's preliminary options as well as what the community value about the site and how it could be improved.



2. How did we engage?

Engagement was undertaken from February 26 until 5pm Sunday 22 March 2026.

Activity	Description
Your Say Victor Harbor	A page was established on Council's Your Say website (www.yoursay.victor.sa.gov.au/camp) which provided information about the Master Plan and how to have a say.
Fact sheet	A fact sheet was prepared to provide information to support community understanding about the projected risk of coastal erosion and flooding to the master plan area and the preliminary options proposed to manage the risks into the future. (Appendix A)
Survey	A survey (Appendix B) was available on the Your Say page for community to provide feedback on the preliminary options and share what they value about the coast or how it could be improved. The survey was available in hard copy on request.
Key stakeholder meetings	One on One meetings were held with key stakeholder groups with assets in the Master Plan area or a strong relationship to it. The below groups were invited to meet (those with an astrix took up the opportunity to meet): • Victor Harbor Croquet Club* • Victor Harbor Yacht Club* • Victor Harbor Bowling Club* • Fleurieu Beach Volleyball/ Qahwa Café* • Victor Harbor Horse Drawn Tram* • Landscape Board - Hills and Fleurieu* • Victor Harbor Coast care* • Biodiversity Victor Harbor* • Ngarrindjeri Aboriginal Corporation (NAC) (the Chair of NAC advised that the Board will discuss the project at their meeting on 24 April and provide feedback to Council) • Victor Harbor - Goolwa Sea Rescue Squadron • Causeway Cafe • Dunes Mini Golf • Victor Harbor Caravan Park • Victor Harbor RSL
Promotion	• Signage established along the foreshore • Emails to stakeholders • Social media posts

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3. What did we hear?

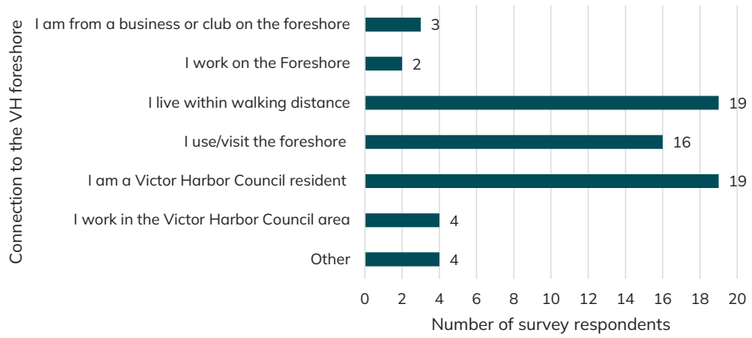
3.1 Survey

There were 27 respondents to the survey. Not all respondents answered all questions. Each option received between 14 and 18 responses to indicate level of support. It is important to note that this is a small sample size and may not reflect the views of the broader community.

Survey respondents were asked to identify their connection to the Victor Harbor foreshore between Hindmarsh and Inman Rivers. They could select more than one response.

Most survey respondents were Victor Harbor residents and lived within walking distance of the project area. Three respondents were from a business or club on the foreshore, and a further two worked on the foreshore. While the survey was anonymous, it is likely that some of the respondents were also part of the key stakeholder meetings. Hence their views may have been represented twice within this Engagement Summary Report.

What is your connection to the Victor Harbor foreshore between Hindmarsh and Inman Rivers? Please select all that apply.



Only two respondents were not a resident or ratepayer of Victor Harbor, and four respondents were ratepayers but not residents.

The following table summarises the preliminary option that was most preferred by survey respondents for each site.

Site	**Preferred option for survey respondents** (based on combined support and strongly support responses)
Site 1 - Hindmarsh River Estuary / Bridge Point	Option 1b Hold the Line
Site 2 - Croquet Club / Skate Park / Tennis Courts	Option 2c Transform (Noting that Option 2a Hold the Line and Managed Retreat had the same level of combined support, but Option 2c Transform received a greater number of strongly support responses)
Site 3 - Flinders Parade / Heritage Cafe / Lawn Bowls / Soldiers Memorial Garden	Option 3b Hold the Line
Site 4 - Esplanade Beach Dunes	Option 4b Hold the Line (Noting that Option 4b Hold the Line received the highest level of combined support and strongly support responses, but Option 4c Transform received a larger number of strongly support responses)
Site 5 - Inman River Estuary & Caravan Park	Option 5c Transform

Survey respondents also provided feedback about what they value and the improvements they would like to see for each site.

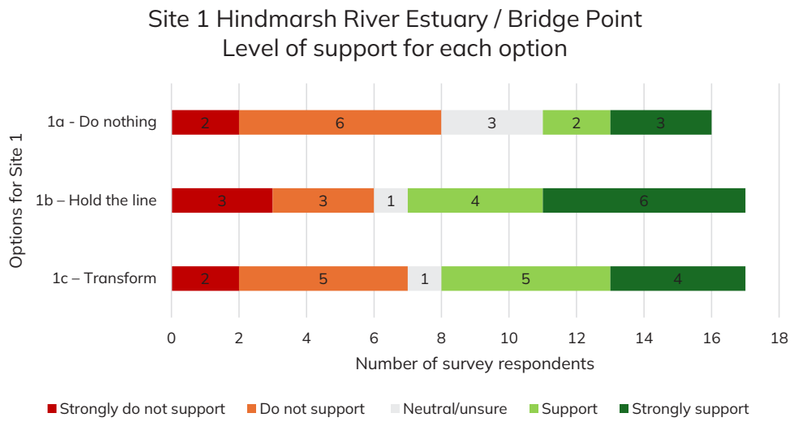
3.1.1 Site 1 - Hindmarsh River Estuary / Bridge Point

Level of support for each preliminary option

Option 1b Hold the Line received the greatest level of support from survey respondents for Site 1, with 10 out of 17 survey respondents supporting or strongly supporting this option.

Option 1C Transform received the second greatest level of support from survey respondents for Site 1. The least amount of support was provided for Option 1a Do Nothing, with only five respondents supporting or strongly supporting this option and 8 respondents not supporting or strongly not supporting this option.

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What do you value about the Site 1 area now?

Survey respondents indicated that they value the following existing aspects of the Site 1 area:

- The beauty of the natural, unmodified coastal environment.
- The open views it provides given its elevated position.
- The natural environment including the Norfolk Pines, extensive birdlife, planting surround the picnic area, old swamp paperbark trees in the lagoon area, revegetation at Bridge Point, dune replanting and grassed reserve.
- The beach, lagoon, river estuary, dunes and reserve.
- The existing open space and usable beach area.
- The safe walking paths, cycling paths and boardwalks.
- Its current layout.
- The carpark.
- The bowling club.

What would improve the Site 1 area?

Survey respondents suggested the following improvements for the Site 1 area:

- A more naturalised environment including sand dune restoration and revegetation and expanding the vegetated zone that exists between the road and beach.
- Improved pedestrian access including a path along the foreshore road, raised boardwalks along the coast, better access to beach and/or a car free zone.

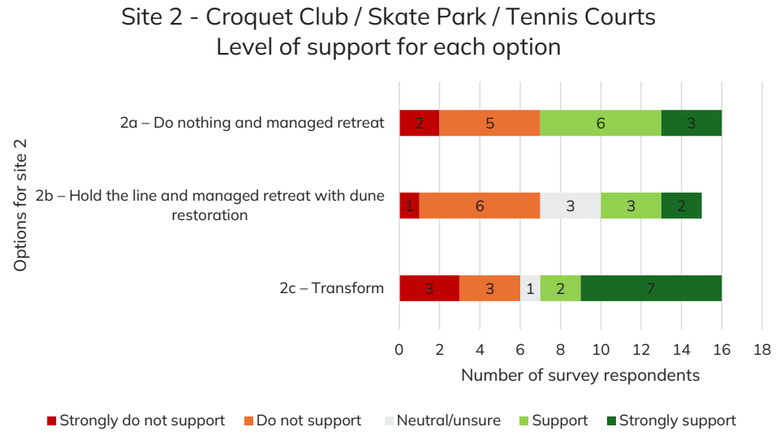
- Hard infrastructure solutions including sea walls, restoring the two wooden groynes and redesigning the stormwater outlets.
- Public amenity upgrades including low-impact lookouts.
- Relocating existing built form including the existing foreshore clubs and parking.
- No more building approvals along the Esplanade (Bridge Terrace).
- Some dredging of the river to improve water flow.
- Protecting and strengthening the natural estuary and dune function rather than over-engineering it too early – a design that keeps future options open as the shoreline changes over time.
- Better fencing to reduce off path tracks being created through the dunes.

3.1.2 Site 2 - Croquet Club / Skate Park / Tennis Courts

Level of support for each preliminary option

Option 2c Transform received the greatest level of support from survey respondents for Site 2, with nine out of 16 survey respondents supporting or strongly supporting this option and 6 respondents not supporting or strongly did not supporting this option.

Option 2a Do Nothing and Managed Retreat was the second most supported option for Site 2, with the same level of combined support as Option 2c but with less strongly support responses. Option 2b Hold the line and managed retreat with dune restoration received the least amount of support from survey respondents for Site 2.



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What do you value about the Site 2 area now?

Survey respondents indicated that they value the following existing aspects of the Site 2 area:

- Public amenities and open spaces including the beach, open spaces, skate park and beach volleyball courts.
- Coastal views.
- The natural beach front.
- The site's historical link to Victor Harbor.
- Safe public access to walk and cycle.
- Peaceful atmosphere.
- The sites key role in community identity.
- Known Hooded plover breeding location.
- Access to the water for small yachts and school regattas.
- Nothing.

What would improve the Site 2 area?

Survey respondents suggested the following improvements for the Site 2 area:

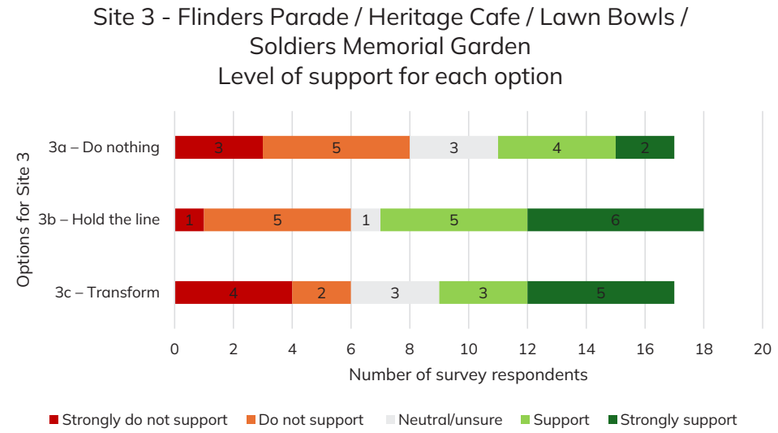
- Return to a more natural vegetated environment and dune system to support coastal resilience.
- Remove existing hard infrastructure including the road, sporting facilities/clubs and relocate these further back from the shoreline. Cease future building approvals in the area.
- Redesign current public facilities including the volleyball courts and playground.
- Improve stormwater management.
- Improve pedestrian access.
- Preserve important community recreation values.
- Fencing to deter people walking through the dune system.
- Stabilisation of the sand.
- No changes needed.

3.1.3 Site 3 - Flinders Parade / Heritage Cafe / Lawn Bowls / Soldiers Memorial Garden

Level of support for each preliminary option

Option 3b Hold the Line received the greatest level of support from survey respondents for Site 3. 11 out of 18 respondents supported or strongly supported this option, and six respondents did not support or strongly did not support this option.

Option 3c Transform received the second greatest level of support from survey respondents, with Option 3a Do Nothing receiving the least amount of support.



What do you value about the Site 3 area now?

Survey respondents indicated that they value the following existing aspects of the Site 3 area:

- Public facilities including the bowls club, pedestrian and cycle paths, green areas, playground and sporting facilities.
- The site's heritage/memorial significance.
- Coastal views.
- Local events and functions.
- Access to Granite Island.
- Habitat for shore birds including Hooded Plovers.
- Tourism value and a place people identify with Victor Harbor.
- Nothing.

What would improve the site 3 area?

Survey respondents suggested the following improvements for the Site 3 area:

- Minimise investment in hard infrastructure and prioritise retaining the beach and associated ecosystems as well as public realm by returning the site to a more natural environment.
- Relocate the memorial park, playground, road car park further back from the coast, including through council repurchasing private lots for this use.
- No further development.
- Better care of existing trees and more new planting.

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- Planning for a long-term, cohesive layout.
- Cleaner beach including with less seaweed to allow for more swimming etc.
- Sea walls or extending the height and width of loose stone rock wall.
- Avoid increasing the height in the sea wall to avoid cutting off view to the sea.
- Bring in paved areas and make it like a town square.
- Restrict the movement of dogs and people through bird nesting areas on the beach - especially during the breeding season from September to March.
- Options to moving the wave break further out from the beach.
- Improve access to beach.
- Nothing.

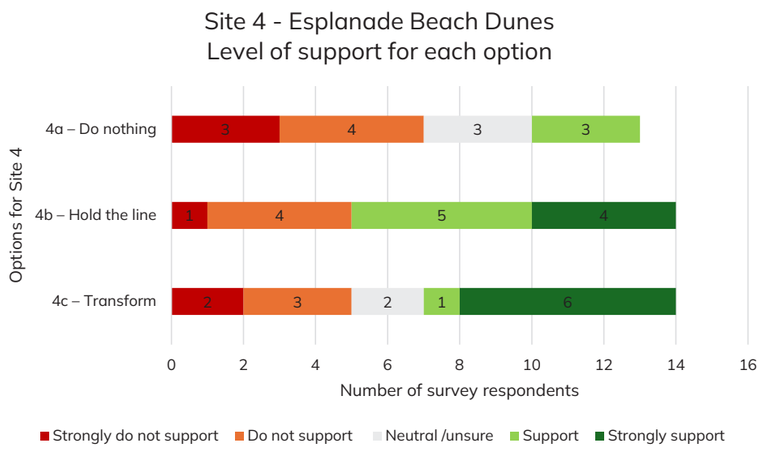
3.1.4 Site 4 - Esplanade Beach Dunes

Level of support for each preliminary option

Option 4b Hold the Line received the greatest level of support from survey respondents for Site 4. Nine out of 14 survey respondents supported or strongly supported this option.

Option 4c Transform received the second greatest level of support for Site 4, with seven respondents supporting or strongly supporting this option. However interestingly, Option 4c received a greater number of strongly support responses than Option 4b (six compared to four).

Option 4a Do Nothing received the least amount of support for Site 4.



What do you value about the Site 4 area now?

Survey respondents indicated that they value the following existing aspects of the Site 4 area:

- Current dune system and vegetation.
- Natural beauty, coastal views, fresh air and open feel.
- Coastal pathway and parks.
- Its role as part of the wider natural estuary, stormwater and shoreline system.

What would improve the Site 4 area?

Survey respondents suggested the following improvements for the Site 4 area:

- A return to a more natural state.
- Remove the road, mini golf, café and car park from the shoreline.
- Reduce erosion including through improved stormwater management, water sensitive urban design (WSUD), dune restoration and coastal management as a priority before hard engineering options are used.
- A new cycling track.
- Better maintenance.
- Adequate fencing and boardwalks to keep the public from making unofficial paths through the dunes.

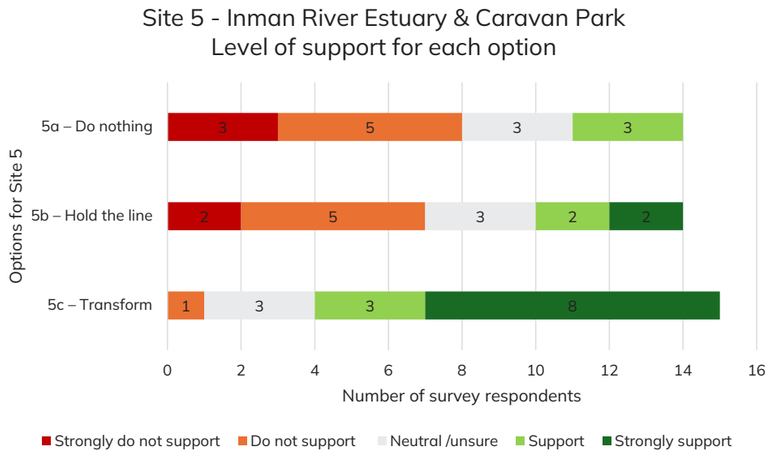
3.1.5 Site 5 - Inman River Estuary & Caravan Park

Level of support for each preliminary option

Option 5c Transform received by far the greatest level of support by survey respondents for Site 5. Over half (8) of the 15 respondents strongly supported this option, with a further 3 indicating support. Only one respondent did not support this option, and there were no respondents that indicated that they strongly did not support the option.

Option 5b Hold the Line received the second greatest level of support for site 5, with Option 5a Do Nothing receiving very little support.

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What do you value about the Site 5 area now?

Survey respondents indicated that they value the following existing aspects of the Site 5 area:

- Natural coastal environment including the wide beaches, dunes, estuary, highly vegetated habitats and wildlife including pelicans.
- Access between Encounter Bay, Victor Harbor and the caravan park.
- Public amenities including the playground, shared path and open space.
- Views.

What would improve the Site 5 area?

Survey respondents suggested the following improvements for the Site 5 area:

- Return to natural state including for restoring dune vegetation and natural river flow, direction and flooding patterns, even if this requires relocation of the caravan park and road. This will restore plant and animal habitats, wetlands and water quality.
- Shared walking and cycling track, raised boardwalks and lookouts.
- First Nations involvement in Kent Reserve.
- Reduce the impact of humans and dogs on vulnerable birds.
- Improve upstream efforts to support the entire estuary-to-coast system.
- In the future, raise the height of the path/levee by the caravan park without blocking the sea view.
- No change needed.

3.1.6 Anything else

At the conclusion of the survey, respondents were invited to share any other comments they had about coastal adaptation in the area. Responses included:

- Encouraging proactive approaches that prioritise nature-based solutions over hard engineering solutions and protect the environment and natural processes.
- Suggestion for council to monitor and gather additional data before lock in expensive, permanent options, or otherwise delaying options that will impact on the environment, community and landholders.
- Seeking additional data/information from the consultants about historic sea levels and the data behind the projections that forecast of three overflow storms per month and other negative outcomes.
- General indications of support for the project.
- Encouragement for council to listen to community recommendations.
- Request to consider coastal adaptation for Kent Reserve.
- Suggesting that the final Master Plan expands beyond just a sea-edge response – also need consider and assess the need for nature-based interventions in the wider catchment-to-coast system to benefit the coast.
- Opposition to the stormwater pipes being redirected to the river systems and causing flooding risk for residential development along the river.
- Highlighting the importance of maintaining public access and amenity connected to a living coastline.
- Suggestions for road upgrades, avoiding building additional boat ramps in these locations, and upgrading the Encounter Bay - Whalers boat ramp.
- Thanks to council for quickly installing the seawall at Yilki.

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3.2 Key stakeholder engagement

Meetings were held with a number of key stakeholders to gather their feedback on the proposed options. Two stakeholders provided written submissions.

The following table summarises the groups and individuals who were engaged and when:

Group	How	Who
Biodiversity Victor Harbor	Meeting	Loretto Cameron Peter Sharley
Victor Harbor Yacht Club	Meeting and written submission	Keith Watkinson Rob Martin
Victor Harbor Coast Care	Meeting	Geoff Cope Loretto Cameron
Landscapes Hills & Fleurieu	Meeting	Caroline Taylor Alison Skinner Paul Wainwright
Victor Harbor Bowls Club	Meeting	Dennis Williams Dale Speck
Fleurieu beach volleyball / tennis courts / cafe	Meeting	Cathy Saunderson Andrew Saunderson
Horse Drawn Tram	Meeting	Megan Whibley
Victor Harbor Croquet Club	Meeting	Shirley Howlett Helen McQueen
Bird Life Australia	Written submission	Julia Roetman Grainne Maguire

The following table summarises the preferred options indicated by representatives from each key stakeholder group during their meeting or in their letter.

	Preferred option for each site (as identified by stakeholders)				
Group	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Biodiversity Victor Harbor	Option 1C Transform	-	Option 3B Hold the Line	Option 4B or combination of Option 4B Hold the Line and 4C Transform	Option 5C Transform
Victor Harbor Yacht Club	-	Option 2B Hold the Line and Managed Retreat and Dune Restoration	-	-	-
Victor Harbor Coast Care	Option 1B Hold the Line or 1C Transform	Option 2C Transform	Option 3B Hold the Line	Combination of Option 4B Hold the Line and 4C Transform then Option 4C	Option 5C Transform
Landscapes Hills & Fleurieu	General preference for nature-based solutions to be prioritised.				
Victor Harbor Bowls Club	Environmental option	-	Option 3B Hold the Line	-	-
Fleurieu beach volleyball / tennis courts / cafe	-	-	Option 3B Hold the Line	-	-
Horse Drawn Tram	-	-	Option 3B Hold the Line	Option 4B Hold the Line	-
Victor Harbor Croquet Club	-	Seawall	-	-	-
Birdlife Australia	Option C Transform, where this protects bird habitat				

The following sections summarise the key points from each meeting.

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3.2.1 Biodiversity Victor Harbor

Feedback provided on the Master Plan

Biodiversity Victor Harbor (BVH) representatives emphasised that the biodiversity of the inlet at the mouth of Inman and Hindmarsh and adjacent areas should be protected. They also noted that Norfolk Island Pines do not provide biodiversity value.

Feedback provided for each site is summarised below.

Site 1

BVH representatives would like to see dune stabilisation with revegetation and fencing, filtering of river water before it enters the ocean, fenced boardwalk access to the beach, a reduced number of beach access points, and no bulldozering of vegetation for green lawn.

Support Option 1C Transform.

Site 3

BVH representatives prefer Option 3B Hold the Line. This area has a business and cultural focus and as such a sea wall protect the amenity and Soldiers Memorial gardens.

Site 4

As with Site 3, this area includes a business and cultural focus and as such BVH representatives support a sea wall to protect amenity and parking maintained. They suggest a combination of Option 4B Hold the Line and 4C Transform with a transition through to Site 4. They suggest pines be replaced overtime with natives. They would like a reduction in the number and impact of the stormwater outlets (i.e. not water discharging onto the beach).

Site 5

BVH representatives prefer Option 5C Transform. They feel that the entire area should be a biodiversity protection zone with natural flooding of the area restored even if this floods the caravan park. They suggested connecting the natural area with Kent Reserve and extending the area to Esplanade Road.

3.2.2 Victor Harbor Yacht Club

The Victor Harbour Yacht Club provided feedback via their key stakeholder meeting and through a letter submitted during the consultation period. The feedback included in both have been summarised together below.

About the Victor Harbor Yacht Club

The representatives provided the following information about the Club.

The Victor Harbor Yacht Club was founded in 1952 and since then has served local families and enthusiasts. They are the fastest growing sailing club in South Australia and have new committee members and young families currently joining. The club is a valuable part of the community, with rooms hired out every day of the week. They have all-day racing on Saturdays from October through March with meetings and social functions at other times.

Their club rooms are next to the Croquet Club. They lease the area and launch their small catamarans and dinghies off the beach. It is important that they remain somewhere on Site 2 (to the bay area north east of the causeway and Granite Island) because:

- the sand and reef on the other side of the causeway is too shallow for safe sailing and access.
- the beach area in front of the Club is the only option for boats and crews to safely negotiate the shore break.
- they need to be in close proximity to the Causeway Boat ramp to launch rescue/support boats.

They need space for approximately 20 racing catamarans to rig up. They also use the Causeway boat ramp to launch two powerboats on race days.

The club have records from 1987 where sand needed to be shovelled out of the club rooms.

Feedback provided on the Master Plan

Site 2

Yacht Club representatives would like the marina development impact on shoreline incursions to be considered in the predictions. They also strongly suggest that cost needs to be a key factor in identifying options.

They prefer Option 2B Hold the Line option in front of the club, however not as it is represented in the preliminary design. They highlight the apparent inconsistency between the red line as it is depicted for Option 1B Hold the Line and Option 2B Hold the Line and would like this to be checked. They also made the observation that the Club appears to be worse off with Option 2B Hold the Line than by Option 2A Do Nothing, and therefore question this prediction. They would like Option 2B to introduce additional protection measures towards the front of their existing site but broadly in line with the sites either side of them.

If Option 2B is not possible, they indicated openness to the club being located further south in Site 2.

They are not supportive of the Transform options.

3.2.3 Victor Harbor Coast Care

Feedback provided on the Master Plan

General feedback by Coast Care (CC) representatives included considering that erosion projections could occur faster than projected and as such options need to be adaptive and fluid; and that the Master Plan must consider the impacts of options on the adjacent areas of the Inman and Hindmarsh estuaries that fall outside the Master Plan site area.

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Feedback provided on each site is summarised below.

Site 1

CC representatives prefer Option 1B Hold the Line or 1C Transform as they believe some hard structures will be needed, however protecting the natural area is their primary interest and they want the Coast Care display garden to be maintained.

Site 2

CC representatives prefer Option 2C Transform with relocation of hard infrastructure to lessen erosion of the beach and restoration of the dunes to support the Hooded Plovers in front of the Yacht Club and Croquet Club.

Site 3

CC representatives would prefer Option 3B Hold the Line with stormwater consolidated and redirected. They also questioned the impact on the causeway headline spit.

Site 4

CC representatives prefer a combination of Option 4B Hold the Line and 4C Transform with the car park and memorial gardens protected (given their commercial importance for Victor Harbor) and then transition into Option C.

Site 5

CC representatives prefer Option 5C Transform which is most likely to preserve Coast Cares' restoration and weed control in the site and protect Hooded Plovers. They would like the impact of sand movement on Kent Reserve to be considered.

3.2.4 Landscape Board Hills & Fleurieu

About Landscapes Hills & Fleurieu

The Landscape Board Hills & Fleurieu (LB) have responsibilities for regulating water affecting activities, managing stormwater and implementing their Coastal Action Plan which covers nearshore habitats, land-based impacts and climate change impacts and incorporates the direction from Council's Coastal Adaptation Study and Strategy.

The LB emphasised the following natural values that Council should strive to maintain:

- Both estuaries are of high value and need to be considered through a whole of system approach. Maintaining functioning estuaries should be a priority including their flow, underground water flow and water allocation planning.
- There is an EPBC Act protected temperate saltmarsh community in the Hindmarsh estuary.
- Hooded Plovers are moving towards the estuaries.
- Sea grass meadows

They noted that Norfolk Island Pines may be reaching the end of their short life span.

Feedback provided on the Master Plan

LB representatives suggested the need to provide additional information about some of the proposed solutions/information including:

- A whole of system approach is important. Need to consider the impacts of options (and stormwater outlet changes) on estuaries, ground water quality and flow, sand loss/movement, habitats.
- Need to consider the flow on impacts of hold the line options on dunes in adjacent areas and particularly on the estuaries (e.g. risk of increased saltwater movement up estuaries).
- Dunes can provide a natural hold the line approach and this should be communicated to community.
- Consider the impact of sea level rise and seawalls on groundwater (salination).
- Consider flow on impacts of options between estuaries and adjacent coastal cells.

Feedback provided on "holding the line" and seawall options included:

- The beach and natural assets are a central part of the community and economy. Holding the line may not be worth it if it causes a loss of the beach.
- Draw a cross section to show the impact of seawalls on beach profile.
- Further explore the impact of the seawall on groundwater, stormwater, dunes to either side, and seawater flow upriver.

Feedback provided on "transform" and prioritising nature-based solutions included:

- Give the environment the best opportunity to operate as a protective buffer to coastal hazards including through protecting and restoring dune vegetation and species diversity particularly for Site 1 and 5.
- In relation to Option 5C Transform for Site 5, consider how to improve stormwater management to reduce erosion, improve stormwater quality, reduce impacts on seagrass and avoid backflow of seawater up the pipes which contaminates groundwater and causes growth of mussels in the pipes.
- Maintain sand connection between sites.

Feedback provided for Site 3 included:

- There is a large amount of space available for retreat.
- If a seawall is implemented, the beach level will drop with sand moving from the Hindmarsh Estuary towards the causeway. Council will need to mine sand from the spit to nourish the beach to maintain the Hindmarsh Estuary.
- If the seawall is set back, there will be more space for beach recession.

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3.2.5 *Victor Harbor Bowls Club*

About the Victor Harbor Bowls Club

Representatives provided the following information about the club.

The Victor Harbour Bowls Club (BC) is the busiest bowls club on the Fleurieu Peninsula with approximately 300 members. The club prides itself in being inclusive and age friendly. In summer they run bowls five times a week, and in winter they run twice weekly social bowls. The club hosts tens of thousands of people across the year, with 650 people hosted each week in March alone.

The club benefits the community with the venue being hired for events and funerals and their two-day bowl club tournaments filling up the caravan park and providing tourism benefits to the area.

The location and in particular ocean views from the club is essential to its success.

The club has a lease on their site until 2041. They own the facilities which are currently valued at $3 million. If the club was forced to move, this would be a significant cost and should be at Council's expense. They are planning to replace two green in the next two years, with one other green recently replaced. Each green has an approximately 15-year lifetime. They also have a strategic plan to replace the current sheds with a new building/shed on the same footprint and a minor upgrade planned for the club room.

They note that the coastal walkway is used more than the beach.

Feedback provided on the Master Plan

Site 3

The BC representatives indicated that Option 3B Sea Wall is their preferred option for Site 3.

The club would like input into the design of the seawall. Their priority is to maintain views of the beach over the wall, and they have concerns that this will be prohibited if the wall is raised too high. They note that their coastal views are central to their level of income and mental health.

They also explained that wind comes down Coral Street and affects their bowling games, which will be made worse by the proposed sea wall.

They wondered whether a groyne may be more suitable than a sea wall.

Site 1

The BC support option 1C Transform, noting that the seawall installed at Yilke is causing too much beach erosion. environmental option

3.2.6 *Fleurieu Beach Volleyball / Café*

About the Fleurieu Beach Volleyball / Café

The Fleurieu Beach Volleyball / Café has had a lease/license since 2005. Before 2005 the site was used as a carpark for bowling. They started to lease the area with the aim of activating the area in particular for young people.

The volleyball courts have been the main focus given their use by local youth with $500,000 invested. Sadly a partnership with Volleyball SA fell through.

Current challenges they experience include sand blowing from the beach volleyball courts to the beach and stormwater drainage. They do not currently experience any coastal flooding. They note that the seaweed on the beach acts as a protective wall.

They are planning on retiring soon.

Feedback provided on the Master Plan

The representatives are not set on a particular option. They see merit in the seawall (Option 3B Hold the Line) for site 3, however overall they want what is best for the town, young people and jobs. They encourage council to focus on addressing current issues and reassessing in 20 years when the coastal hazards may be more extreme.

3.2.7 *Horse Drawn Tram*

About the Horse Drawn Tram

The Horse Drawn Tram representative explained that they are the main area people come to when they visit Victor Harbor. In site 3, they have a building and horse stables and need access to the beach with horses, the car parking and the boat ramp. Their building is Council-owned and they intend to stay on the site.

They noted that the causeway has changed the way sand moves, with sand now blowing up onto the tracks, bogging the tram and causing trip hazards. They do not want this issue to be exacerbated.

Feedback provided on the Master Plan

Site 3

The Horse Drawn Tram representative prefers Option 3B Hold the Line, given they would not be able to operate under Option 3A Do Nothing and are unsure how they would be impacted by Option 3C Transform.

Site 4

The Horse Drawn Tram representative prefers Options 4B Hold the Line given this retains the car parking area and ability to walk and ride on the beach with horses.

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3.2.8 Victor Harbor Croquet Club

About the Victor Harbor Croquet Club

Representatives provided the following information about the club.

The Victor Harbor Croquet Club (CC) has operated for 102 years and currently has approximately 65 members. They note that the Croquet Club and Yacht Club receive more usage than the beach and playground in front. It is a good and inclusive activity for the growing older population.

They lease a Council-owned building. They note that continued maintenance or upgrades are desired to the facilities (e.g. spruce up the toilets).

The Club is not interested in moving to another site, with cost and ability to establish new lawns presenting a substantial barrier unless Council provided significant financial assistance. They note that croquet must be played on natural turf. They also emphasise the difficulty in the club planning ahead to 2100.

Feedback provided on the Master Plan

Site 2

The CC representatives would prefer the seawall in Option 2B Hold the Line to be extended to protect their facilities. If have to move this needs to be to a location with suitable natural greens and at Council's expense.

3.2.9 Birdlife Australia

Birdlife Australia did not have a key stakeholder meeting. However, they submitted a detailed letter of feedback which has been summarised below.

About Birdlife Australia

BirdLife Australia (formerly Birds Australia) is a highly respected, science-based, not-for-profit conservation organisation. They have 13,000 members Australia-wide and more than 100,000 volunteers and supporters, who are dedicated to achieving outstanding conservation results for our native birds and their habitats. During the 2024/25 Hooded Plover breeding season, volunteers from the region spent over 6,911 hours monitoring the Hooded Plovers and their threats. Over 864 of these hours were spent by local volunteers in the City of Victor Harbor.

About bird life in the project area

The coastline at Victor Harbor provides essential habitats for coastal-dependent native species, including shorebirds, inshore seabirds and waterbirds. Notably, the beaches and dunes of Sites 1 - 5 provide crucial breeding habitat for the EPBC-listed, threatened Hooded Plover (Eastern). The area also provides foraging areas for young (just fledged) Sooty Oystercatchers (listed as rare in SA) and small numbers of EPBC-listed migratory shorebirds. Strong site fidelity means Hooded Plover breeding pairs cannot easily change breeding locations. Flightless chicks must feed themselves from when they hatch and must be able to move to the water's edge and along the shore to access enough food for survival.

Further information on birdlife is available in the full letter in Appendix D of this report.

Feedback provided on the Master Plan

Birdlife Australia would like the Master Plan to maintain shorebird habitat and also allow for enhanced breeding and feeding areas for shorebirds. They believe options that threaten these habitats need to be avoided.

They make the following recommendations:

- Coastal adaptation options should be further evaluated for their impacts on shorebird habitat and with the advice of shorebird ecologists, with these impacts avoided wherever possible especially for EPBC Act listed species as per National impact assessment obligations.
- For planning and development that may impact shorebird habitat there should be continuous consultation with the relevant stakeholders including Birdlife Australia.
- During construction and operation of these site options, considerations must include protecting Hooded Plovers from disturbance by people, dogs, vehicles and loss of habitat.
- Planning for this section of coastline should also include maintaining or enhancing migratory shorebird foraging and roosting habitat.

Option C Transform seems to provide better outcomes for dune habitat; however, this is not presented as the situation across all sites.

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Appendix A – Fact Sheet

NOTE: APPENDIX A HAS BEEN EXCLUDED FROM THIS REPORT

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Sustainable Design Opportunities Checklist

Date: 1/04/2026

Design Driver Alignment
- Circular Economy + Adaptive Reuse
- Reduce Embodied Carbon
- Reduce Operational Carbon
- Ecology + Bio Diversity
- Climate Change Resilience

Sustainable Design Opportunities Checklist

Discipline	Design Phase		ESD Opportunity	Benefit	Design Driver	Comments/ Actions
ARCHITECTURE / GENERAL	CONCEPT	☐	Is a new building necessary to meet the brief. Has retrofit been considered?	Making use of existing buildings will reduce overall carbon footprint.		
		☐	Can existing materials/products on site be re-used?	Prioritising material reuse will reduce carbon footprint.		
		☐	Seek to simplify the design. Rationalise the building/project mass and scale. Only build what is required to meet the brief. Consider multipurpose spaces.	Cost saving as the quantity of materials and time required to deliver the project is reduced. Simple designs generally mean lower embodied carbon.		
		☐	Consider topography and building siting to minimise cut and fill. Locate building elements on level portion of site. Reuse excavated soil to reduce soil qty removed from site.	Cost saving as reduces complexity of civil works.		
		☐	Identify '**big ticket items**' - consider the material for superstructure, substructure, façade and internal finishes. Reduce the use of high embodied carbon materials such as concrete, steel and aluminium. Consider using timber structure or hybrid (CLT, GLT, wall & ceiling framing).	Significant embodied carbon reductions are possible with a considered super structure material selection.		
		☐	Consider mechanically fix systems rather than adhesive fix so building/items can be demounted and reused/recycled.	Supports a circular economy		
		☐	Site analysis: prioritise building orientation, with glazing facing North/South. Services/BOH spaces located on East/West elevations.	When a building is orientated North- South, horizontal façade shading, such as verandas, eaves and shrouds will effectively minimise solar heat gain in summer while enabling desired gains in winter, assisting with passive heating. Horizontal shading is commonplace and easy to integrate into any design.		
		☐	Site analysis: Building orientation considered to protect outdoor spaces from prevailing winds. Orient openable windows to allow for natural/passive ventilation based on wind direction on site.	Provides user comfort and improves effectiveness of natural ventilation.		
		☐	Adequate horizontal shading to windows located on the northern elevation, tested via Revit sun study.	Minimises solar heat gain in summer but allows in winter.		
		☐	Adequate vertical shading to windows located on East and West elevations, tested via Revit sun study.	Minimises solar heat gain and glare.		
		☐	Run an embodied carbon analysis on all early concept designs to understand impacts.	Software TBC (Forma massing).		
		☐	Incorporate ventilated and weatherproof storage facilities for the collection and disposal of general, recyclable, organic waste, and bulky waste.			
		☐	Maximise thermal insulation within exterior walls using minimum 140mm/150mm studs.	Thermal performance of building fabric is improved as external walls can have R5 insulation 2x 90mm 2.5R batts.		
	DESIGN DEVELOPMENT	☐	High-level windows for passive ventilation and night purging.	Allows passive ventilation, minimising the reliance on mechanical ventilation during mild weather, lowering operational costs. Allows for secure, night purge ventilation.		
		☐	Openable high light or side light windows to internal doors.	Allows for cross ventilation throughout the building interior.		
		☐	Double glazing to all exterior windows. Review optimal glazing specification with engineers.	Contributes to a improved R rating of external walls. Reduces undesirable solar heat gains in summer and interior heat loss in winter.		
		☐	High performance glazing to windows located on East and West elevations. Review optimal glazing specification with engineers.	Low - e glass minimises undesirable ingress of solar radiation		
		☐	Blinds to rooms located along eastern and western elevation	Mitigates glare, overheating and improves thermal comfort for building users		
		☐	Dual vapour permeable membranes to external walls and roof cavity as per Proclima's detail.	Offers superior airtightness which improves efficiency of air conditioners, reducing running costs. Provides condensation control, minimising risk of mould and improving air quality.		
		☐	Thermally broken aluminium window frames.	Reduces cold bridges in building envelope and condensation points which become mould hotspots.		
		☐	Thermal bridge free construction detailing that focuses on airtightness.	Contributes to significant energy savings.		
		☐	Specification of local materials where possible.	Supports the local economy.		
		☐	Wood products to be FSC certified.	Ethically sourced.		
		☐	Rainscreen detail with permeable building wrap and ventilated cavity to external walls.	Ensures adequate airflow to mitigate mould growth.		
		☐	Light coloured roof with high Solar Reflective Index (SRI) finish.	Reduces Heat Island Effect.		
		☐	Light coloured façade and external shading with high Solar Reflective Index (SRI) finish.	Reduces Heat Island Effect and human comfort stress in the public realm.		
		☐	Use off site pre-fabrication techniques to reduce on site construction time, waste, and greenhouse gas emissions, wherever practicable.	Cost, time and carbon benefits.		
		☐	Builder to recycle demolition (if applicable) and construction waste where possible. (Note in specification)	Diverts waste from landfill, the recycling process requires less energy than manufacturing new materials and conserves natural resources.		
		☐	All electric building (no gas).	Eliminates reliance on fossil fuels, particularly gas infrastructure.		
		☐	Solar panel extent maximised on roof area, (and facade if applicable), to maximise onsite energy generation.	Operational carbon reduced.		
		☐	Rainwater tanks for landscape watering and toilet flushing / laundry use.	Potable water preservation.		
		☐	Additional rainwater tanks for irrigation.	Potable water preservation.		

Sustainable Design Opportunities Checklist

Date: 1/04/2026

SERVICES	CONCEPT	☐	Specification of low GWP (Global Warming Potential) refrigerants for air conditioning and hot water heating.	Reduced green house gas emissions from building operation. Contributes to higher energy efficiency and has zero Ozone depletion potential. High-GWP refrigerants are a major concern for climate change because they are potent greenhouse gases that are released through leaks in air conditioning and refrigeration systems. These gases contribute to warming the planet.	
		☐	Consider future proofed risers and a central plant space.	Allows building to be adapted more easily in future.	
		☐	Incorporate Mechanical Ventilation with Heat Recovery. (MVHR)	Allows spaces to reach higher airtightness levels and reduced energy consumption for A/C.	
	DESIGN DEVELOPMENT	☐	Battery Installation.	Onsite energy can be stored which reduces operational carbon needs of the development.	
		☐	EV chargers in carpark.	Provides amenity for owners of EVs. Available infrastructure encourages the uptake of electric vehicles.	
		☐	Electrical provision for EV chargers in carpark (refer NCC requirements).	Creates futureproofed developments.	
		☐	Blower door test	Testing will provide building performance data.	
		☐	Ceiling fans in all habitable rooms	Reduces cooling loads and reliance on mechanical ventilation.	
		☐	Grey water collection and treatment onsite to be reused for irrigation	Water preservation with circular approach.	
		☐	JV3 analysis (refer NCC requirements).	Ensures optimal insulation and glazing requirements are specified.	
		☐	Internal lighting controls including PIR motion sensors and timers.	Ensure there is no wasted energy from lighting and mechanical exhaust fans being left on.	
		☐	External lighting controls.	Lighting controlled by a timer and daylight sensor to ensure lighting is not left on unnecessarily during the day.	
		☐	Heat pump hot water units.	Utilises ambient air to heat water, reducing the energy required for water heating.	
		☐	Water saving hydraulic fixtures.	Reduces consumption of potable water.	
		☐	Airconditioning systems sized to cater for future load increases.	Creates resilient spaces.	
		☐	Onsite organic waste processing (e.g. dehydrator) to use biproduct as compost onsite or sell.	Reduced waste processing and scope 3 emissions.	
STRUCTURAL	CONCEPT	☐	Maximising timber construction for superstructure. CLT & GLT	Timber is a carbon sequestering material, thus reducing the overall carbon footprint of the development when compared to alternatives such as concrete or steel.	
		☐	Maximising timber construction for secondary structure, roof trusses and wall partitions.	Timber is a carbon sequestering material, thus reducing the overall carbon footprint of the development when compared to alternatives such as concrete or steel.	
		☐	Optimised structure, consider regular structural grid with short spans.	Less materials used, therefore reducing overall cost.	
		☐	Specify green steel or recycled steel.	Carbon emissions are significantly reduced when steel is produced using renewable energy such as hydrogen or with electric furnaces.	
		☐	Low carbon concrete slab.	Made by replacing a portion of Portland cement, the most carbon-intensive component, with alternatives like fly ash and slag.	
	DESIGN DEVELOPMENT	☐	Reduce the weight of dead loads and large spans where possible. Understand what loadings are required to meet the brief.	Designing in efficiency to reduce or mitigate overengineering, cost effective and reducing embodied carbon by building only what is needed with smaller structural members	
		☐	Structural members designed for 100% utilisation rate where possible	Designing in efficiency to reduce or mitigate over-engineering. Cost effective and reduces embodied carbon by building only what is needed	
LANDSCAPE	CONCEPT	☐	Design with WSUD principals e.g. raingardens, retention, reuse for irrigation. Kerb inlets redirecting water into gardens. https://cdn.environment.sa.gov.au/environment/docs/water-sensitive-urban-design-policy-gen.pdf	Improves biodiversity, acts as a teaching opportunity and making use of passive water harvesting onsite. Plants in the swale will also assist with natural water treatment before the runoff reaches the stormwater system.	
		☐	Deciduous trees and plants to western building façades for shading.	Provides shade in summer while allowing in winter sun. Facilitates passive heating and cooling	
		☐	Specify native plants. Drought tolerant or suitable species for SA arid climate.	Creates resilient and drought tolerant landscapes. Improves biodiversity.	
		☐	Identify flora and/or fauna to support based on site location. https://www.environment.sa.gov.au/topics/biodiversity/threatened-species-and-ecological-communities/regional-and-significant-projects/regional-species-conservation-assessment-project	Increases biodiversity (caring for country). Returns country to pre-colonisation landscapes.	
		☐	Planting to carparks	Provides shading and reduces the heat island effect.	
		☐	Green infrastructure decision with civil/stormwater, early decision with consultants. https://www.dit.sa.gov.au/__data/assets/pdf_file/0006/958236/Green_Infrastructure_Commitment.pdf		
		☐	Plant selection that encourages biodiversity, e.g. fruiting and flowering plants.	Improves biodiversity (caring for country).	
		☐	Designing for animals as well as people (wildlife corridors)	Improves biodiversity (caring for country).	
		☐	Increase tree canopy. Check council standard, then exceed baseline. (DIT 50%)	Reduces urban heat island effect.	
		☐	Specify local materials. Local Quarries, bricks etc.	Promotes local business and reduces transport distances.	
		☐	Limit Bitumen. Green concrete specification, via civil specification	Reduce embodied carbon. Coordinate with engineers.	

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Sustainable Design Opportunities Checklist

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LANDSCAPE/CIVIL		☐	Consider percentage of soft and hardscape. Increase softscape, however consider accessibility.	Reduces storm water runoff, improves biodiversity.	
		☐	Site levels considered to mitigate impacts of future flood events.	Reduces flood risks and damage.	
		☐	Consider external lighting type and qty to ensure light pollution is been minimised.	Lower levels of light pollution benefits both people and fauna.	
		☐	Design to prioritise bikes and pedestrians. Prioritise active transport over cars.	Reduces urban greenhouse gases and promotes a walkable city.	
	DESIGN DEVELOPMENT	☐	100% permeable paving to carparks. Include permeable asphalt products. (Review trafficability and cost impacts.)	Reduces storm water runoff, flood mitigation.	
		☐	100% permeable paving to footpaths. Review permeable concrete and grout options.	Reduces storm water runoff, flood mitigation.	
		☐	Reuse demolished trees as mulching on site.	Cradle to Cradle approach.	
		☐	Demolition - consider what is existing on site and what can be reused, with particular focus on hard materials. (e.g. reusing crushed concrete onsite).	Reduces demolition waste. Cost saving compared to buying new.	
		☐	Retain and reuse soil onsite for cut and fill and/or land forming.	Reduces demolition waste.	
		☐	Create insect hotels.	Increasing biodiversity (caring for country).	
		☐	Retain trunks of removed trees for seating, or use within landscape.	Reduces demolition waste. Cradle to Cradle approach.	
		☐	Design in flush kerbs.	Improves accessibility and promotes active transport / bike use.	
		☐	Include structures for shading. Canopies & lightweight retractable awnings provide opportunities for comfortable outdoor occupation in shade.	Reduces heat Island effects. Creates resilient outdoor play spaces.	
		☐	Stormwater infrastructure sized to cater for future predicted peak storm water events.	Reduces flood risks.	
		☐	Woody meadows planting. (Cooler, greener, wilder schools, and public spaces)	Increases biodiversity (caring for country).	
INTERIORS	CONCEPT	☐	Biophilia focus in the interior.	Improved internal air quality and wellbeing of building occupants.	
		☐	Timber internal glazing and door suites in lieu of aluminium.	Timber is a carbon sequestering material thus reduces the overall carbon footprint of the development when compared with alternatives such as concrete or steel.	
		☐	Reduce quantity of internal finishes, if not required for acoustic or another functional requirement then consider removing it. (E.g. a ceiling lining may not be necessary, allow services to be exposed)	Simple designs generally mean less embodied carbon and less cost.	
		☐	Retain existing built forms and finishes. Salvage existing furniture.	Reduces embodied carbon & provides a potential cost saving.	
		☐	Design team to question how much of the existing fit out can be retained. Can items removed and retained for reuse on a current or future fit out?	Reduced embodied carbon & potential cost saving.	
		☐	Use loose furniture/ items rather than built in, e.g., meeting pods/phone pods.	Financial benefit as these items are seen as equipment (tax depreciation) & clients can take items with them if they relocate (becomes an asset).	
		☐	Design forever floor plate (future proofing for multiple uses, e.g. access/egress).	Reduces the need for major/structural alterations to existing spaces. Reduces embodied carbon at re-fit stages. Promotes a circular economy.	
		☐	Dedicated bicycle storage and end of trip facilities for tenants/building users.	Supports active transport. Reduces car usage.	
		☐	Understand what the client actually needs acoustically, rather than designing for greater performance than is required. Consider asking the client which rooms, in their existing spaces, already perform as needed then mimic that.	Acoustic requirements are achieved with less treatment.	
	DESIGN DEVELOPMENT	☐	Utilisation of paints, sealants, adhesives, carpets, coverings, and furniture which have low off-gassing properties (low VOC, low formaldehyde).	Contributes to improved interior air quality for occupants.	
		☐	Interior wall panelling specification (pinboards, acoustic panels) to be a product with high recycled content or biodegradable.	Diverts waste from landfill. The recycling process requires less energy than manufacturing new materials and conserves natural resources.	
		☐	Consider modular design principals and dimension to standard material sizes.	Reducing construction waste. Cost efficient. Supports a circular economy.	
		☐	Consider a reuse strategy for furniture. E.g. leasing/renting furniture instead of buying new or reupholstering existing furniture.	Cost saving, reducing embodied carbon in fit out projects.	
		☐	Specify locally sourced furniture and lighting.	Supports local businesses and reduces carbon emissions from transport. Often local products are of a higher quality and are longer lasting.	
		☐	Using pin joints and mechanical fixings over adhesives.	Items can be demounted and reused more easily. Supports a circular economy.	
		☐	Consider demolition. Ensure O&M manuals capture future take back systems. Include specification sections with a hold point for builder to review existing products and communicate what their strategy for waste is.	Supports a circular economy. Reduces waste to landfill.	
		☐	Access to views from within the building to outside - sightlines and visual connectivity to the environment		

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Resources

Culture and heritage

- The Burra Charter – the Australia ICOMOS Charter for Places of Cultural Significance, Australia International Council on Monuments and Sites (2013)
- Connecting with Country (PDF 11.1MB), Government Architect NSW (2023)
- Designing with Country (PDF 1MB), Government Architect NSW (2020)
- Design Guide for Heritage, Government Architect NSW (2019)
- Sea Country – an Indigenous perspective (PDF 1.24MB), National Oceans Office (2002)
- Aboriginal Heritage Information Management System, Heritage NSW
- Aboriginal Cultural Values: An Approach for Engaging with Country, Danièle Hromek for the Department of Planning, Industry and Environment (2020)
- Practice Note: Engaging with Aboriginal Communities (PDF 1.84MB), Department of Planning and Environment.

Environmentally sensitive design

- Greener Places, Government Architect NSW (2020)
- Blueprint for Living Cities: Policy to Practice (PDF 71.5MB), National Green Infrastructure Network (2017)
- Urban Green Cover in NSW – Technical Guidelines (PDF 1.49MB), Office of Environment and Heritage (2015)
- Water sensitive urban design guideline (PDF 6MB), Transport for NSW (2023)
- Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions, Office of Environment and Heritage and the NSW Environment Protection Authority (2017)
- Environmentally Friendly Seawalls – A Guide to Improving the Environmental Value of Seawalls and Seawall-lined Foreshores in Estuaries (PDF 1.81MB), Office of Environment and Heritage (2009)
- Coastal Dune Management – A Manual of Coastal Dune Management and Rehabilitation Techniques (PDF 5.73MB), NSW Department of Land and Water Conservation (2001)
- Healthy Estuaries for Healthy Oysters – Guidelines (PDF 2.49MB), NSW Department of Primary Industries (2017)
- NSW Boat Ramp Facility Guidelines (PDF 5.12MB), NSW Roads and Maritime Services (2017)
- Queensland Urban Drainage Manual, Institute of Public Works Engineering Australasia, Queensland (2018)
- About Fish Friendly Marine Infrastructure, Fish Habitat Network (2019)
- National Light Pollution Guidelines for Wildlife – Including marine turtles, seabirds and migratory shorebirds (PDF 6.63MB), Department of the Environment and Energy and WA Department of Biodiversity, Conservation and Attractions (2023)



Pelicans and seagulls at dawn in Wagonga Inlet, Narooma – Eurobodalla LGA / Yuin Country (Photography: Destination NSW)



Woman enjoys a walk at Fingal Head Beach – Tweed LGA / Bundjalung Country (Photography: Destination NSW)

General urban design guidance

- Better Placed, Government Architect NSW (2017)
- Urban Design for Regional NSW (PDF 9.6MB), Government Architect NSW (2020)
- Apartment Design Guide (PDF 21MB), NSW Department of Planning, Industry and Environment (2015)
- Practitioner's Guide to Movement and Place (PDF 5.39MB), Government Architect NSW and Transport for NSW (2020)
- Evaluating Good Design, Government Architect NSW (2018)
- Place Analysis Advisory Note (PDF 613KB), Government Architect NSW (2019)
- Beyond the Pavement, NSW Roads and Maritime Services (2020)
- Siting and design guidelines for structures on Victorian coast, Department of Environment, Land, Water and Planning, VIC (2020)
- Guidelines for Landscape and Visual Impact Assessment, The Landscape Institute (2013)

Mapping and evaluation tools

- ePlanning Spatial Viewer, NSW Department of Customer Service (2020)
- Sharing and Enabling Environmental Data (SEED) Portal, NSW Government (2021)
- Biodiversity Assessment Method – Biodiversity Offsets Scheme, NSW Department of Planning, Industry and Environment (2020)
- Biodiversity Values Map and Threshold Tool, NSW Department of Planning and Environment (2020)
- Fisheries NSW Spatial Data Portal, NSW Department of Primary Industries (2020)
- NSW Flood Data Portal, NSW State Emergency Service and NSW Department of Planning, Industry and Environment (2021)
- Social and Economic Evaluation of NSW Aquaculture, University of Technology Sydney (2016)

Natural hazards

- NSW Coastal Management Manual, Office of Environment and Heritage (2018)
- Coastal Management Toolkit, Department of Planning and Environment (2022)
- Strategic Guide to Planning for Natural Hazards, Department of Planning, Industry and Environment (2021)
- Floodplain Development Manual and Flood Prone Land Policy, NSW Department of Infrastructure, Planning and Natural Resources (2005)
- Flood Risk Management Manual (PDF 1.3MB), NSW Department of Planning and Environment (2023)
- Flood Prone Land Package, Department of Planning, Industry and Environment (2021)
- Planning for Bush Fire Protection 2019 (PDF 9.73MB), NSW Rural Fire Service (2019)
- Planning approaches and instruments for Adaptation (PDF 1MB), CoastAdapt, National Climate Change Adaptation Research Facility (2018)
- Climate change adaptation planning for protection of coastal ecosystems (PDF 8.7MB), CoastAdapt, National Climate Change Adaptation Research Facility (2016)
- Practice Note 12.1: Climate Change Impacts on the Useful Life of Infrastructure, Institute of Public Works Engineering Australasia (2018)
- Practice Note 12.2: Climate Resilient Materials for Infrastructure Assets, Institute of Public Works Engineering Australasia (2021)
- Climate Change Adaptation Guidelines in Coastal Management and Planning (PDF 3.8MB), Engineers Australia (2012)
- Guidelines for Responding to the Effects of Climate Change in Coastal and Ocean Engineering, Engineers Australia (2017)
- Coastal Engineering Guidelines for working with the Australian coast in an ecologically sustainable way (PDF 4.4MB), Engineers Australia (2017)
- Australian Disaster Resilience Handbook Collection, Australian Institute for Disaster Resilience
- Climate Risk Ready NSW Guide (PDF 3.9MB), Department of Planning, Industry and Environment (2020)
- AdaptNSW website, AdaptNSW

Strategies, policies and plans

- Our Place on Country – Aboriginal Outcomes Strategy 2020-23 (PDF 7.87MB), Department of Planning and Environment (2020)
- Aboriginal Cultural Heritage Management Plan (PDF 13.9MB), Tweed Shire Council (2018)
- NSW Marine Estate Management Strategy 2018 – 2028 (PDF 12.6MB), Marine Estate Management Authority (2018)

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Glossary

Accretion is the build-up of sediments to form land or shoaling in coastal waters or waterways. It may be natural (caused by natural processes) or artificial (resulting from built structures).

Active recreation is generally associated with the use of purpose built facilities including sporting fields, swimming pools, playgrounds and exercise equipment in an indoor or outdoor setting.

Active transport is human-powered. For example, walking or cycling.

Adaptive management can be adopted where there is uncertainty about future conditions. Adaptive management involves and ongoing process of monitoring, evaluation, review and implementation to improve management over time.

Acid sulfate soils are natural sediments that contain iron sulfides. When disturbed or exposed to air these soils can release acid, damaging built structures and harming or killing animals and plants. Local Environmental Plans contain maps of different classes of acid sulfate soil.

Beach is defined in the NSW *Coastal Management Act 2016* as an area that is composed of sand or pebbles or similar sediment that extends landwards from the lowest astronomical tide to the line of vegetation or bedrock or structure.

Coastal assets are natural features of the coastal zone, including landforms, ecosystems and species, and built assets such as infrastructure, public and private buildings or structures.

Coastal dunes are vegetated and unvegetated sand ridges built up at the back of a beach. They comprise dry beach sand that has been blown landward and trapped by plants or other obstructions.

Coastal environment area (CEA) is defined in the NSW *Coastal Management Act 2016* as the land identified by a State environmental planning policy to be the coastal environment area for the purposes of that Act, being land containing coastal features such as the coastal waters of the state, estuaries, coastal lakes, coastal lagoons and land adjoining those features, including headlands and rock platforms.

Coastal hazard is defined in the NSW *Coastal Management Act 2016* as beach erosion, shoreline recession, coastal lake or watercourse entrance instability, coastal inundation, coastal cliff or slope instability, tidal inundation, and erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters.

Coastal hazard and risk areas are any mapped coastal vulnerability areas and/or areas affected by (or projected to be affected by) coastal hazards that have been identified in a state environmental planning policy, local environmental plan, development control plan, coastal management program, coastal hazard policy or study adopted by council.

Coastal inundation happens when a combination of marine and atmospheric processes raises the water level at the coast above normal elevations, inundating land that is usually 'dry' with sea water. Alternatively, the elevated water level may result in wave run-up and overtopping of natural or built shoreline structures (for example, coastal dunes, seawalls).

Coastal lake or watercourse entrance instability is the variety of potential hazards and risks associated with the dynamic nature of both natural and trained entrances. Coastal lake and watercourse entrances are highly active environments; their shape constantly changes in response to processes such as alongshore sediment transport, tidal flows, storms and catchment flooding.

Coastal landform is the geological formation of the coastline and its unique features mostly through the processes of erosion and deposition. A significant coastal landform is one which has substantial cultural and natural heritage values, including, but not limited to, evidential value, historical value, aesthetic value, and communal value.

Coastal management area is any one of 4 areas that make up the coastal zone as defined in the *Coastal Management Act 2016*. These are the coastal wetlands and littoral rainforests area, coastal vulnerability area, coastal environment area, and the coastal use area.

Coastal processes are marine, physical, meteorological and biological activities that interact with the geology and sediments to produce a particular coastal system.

Coastal protection works are defined in the NSW *Coastal Management Act 2016* as beach nourishment and activities or works to reduce the impact of coastal hazards on land adjacent to tidal waters, including (but not limited to) seawalls, revetments and groynes.

Coastal risk is a risk that relates to the likelihood and consequences of coastal hazards or threats affecting coastal values.

Coastal use area (CUA) is defined in the NSW *Coastal Management Act 2016* as the land identified by a State environmental planning policy to be the coastal use area for the purposes of that Act, being land adjacent to coastal waters, estuaries, coastal lakes and lagoons where development is or may be carried out (at present or in the future).

Coastal vulnerability area (CVA) is defined in the NSW *Coastal Management Act 2016* as the land identified by a State environmental planning policy to be the coastal vulnerability area for the purposes of that Act, being land subject to coastal hazards.

Coastal wetlands are areas that are inundated cyclically, intermittently or permanently with fresh, brackish or saline water and have soils, plants and animals in them that are adapted to, and depend on, moist conditions for at least part of their lifecycle. Coastal wetlands include marshes, mangroves, melaleuca forests, casuarina forests, sedgelands, brackish and freshwater swamps and wet meadows.

Coastal wetlands and littoral rainforest area (CWLRA) is defined in the NSW *Coastal Management Act 2016* as the land identified by a State environmental planning policy to be the coastal wetlands and littoral rainforests area for the purposes of that Act, being land that displays the hydrological and floristic characteristics of coastal wetlands or littoral rainforests and land adjoining those features.

Coastal zone is defined in the NSW *Coastal Management Act 2016* and Resilience and Hazards SEPP as the area of land comprised of the following coastal management areas: the coastal wetlands and littoral rainforest area, the coastal vulnerability area, the coastal environment area and the coastal use area.

Coastal landforms are the landforms along the coastline that are mostly formed by geological processes, such as past volcanic activity, erosion and sedimentation, waves and tides (including longshore and rip currents), climatic factors such as wind, rainfall and temperature. Coastal landforms include headlands, cliffs, bays, tombolos, spits, peninsulas, shoals, caves, coves, dunes and beaches.

Cultural landscapes are described by the World Heritage Committee as representing 'the combined works of nature and man', this refers to how the interaction between humans and their environment manifests over time, bounded by physical constraints and opportunities.

Cultural significance is defined by the Burra Charter as the aesthetic, historic, scientific, social, or spiritual value of a place for past, present, or future generations. Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places, and related objects.

East coast low is an intense low-pressure system that occurs off the east coast of Australia, bringing storms, high waves and heavy rain. East coast lows usually happen in autumn and winter off NSW, southern Queensland and eastern Victoria.

Ecosystem integrity is the intactness, completeness and extent of natural functioning of an ecosystem.

Ecologically sustainable development is development involving the effective integration of social, economic and environmental considerations in decision-making processes. For the full definition, see section 6(2) of the *Protection of the Environment Administration Act 1991* (NSW).

Endangered ecological community is an ecological community listed in the NSW *Biodiversity Conservation Act 2016* as endangered. Examples include coastal saltmarsh, littoral rainforest and Themeda grasslands on headlands.

Erosion happens when the action of natural forces wears land away. On a beach, erosion is the carrying away of beach material by wave action, tidal currents, littoral currents, or by deflation.

Estuary is defined by the *Coastal Management Act 2016* (NSW) as any part of a river, lake, lagoon, or coastal creek whose level is periodically or intermittently affected by coastal tides, up to the highest astronomical tide.

Estuary inundation is flooding around the shoreline of an estuary or coastal lake, by a mixture of tidal water and catchment flood water.

Essential infrastructure is defined by the *Coastal Management Act 2016* (NSW) as infrastructure for electricity generation, transmission and distribution, telecommunications, rail, roads, gas, sewerage systems, water supply systems or stormwater management systems, airports, ports shipping and harbours.

Eutrophication is a process where an increase in nutrient levels in a body of water causes it to become deoxygenated.

Floodplain is a flat tract of land bordering a river, mainly in its lower reaches, and consisting of alluvium deposited by the river. In flood planning, the floodplain is the area of land that is subject to inundation by floods up to and including the probable maximum flood.

Foreshore is defined in the NSW *Coastal Management Act 2016* as the area of land between the highest astronomical tide and the lowest astronomical tide. The term foreshore includes both open coast and estuary foreshores.

Geoheritage or geological heritage - refers to the variety of rocks, minerals, fossils, landforms, sediments and soils, together with the natural processes which form and alter them, which provide information about the Earth's past.

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Green infrastructure is an adaptable term used to describe an array of products, technologies and practices that use natural systems – or designed systems which mimic natural processes – to improve environmental sustainability and human quality of life.

Greenbelt is an area of open land around an urban settlement, on which building is restricted.

Hazard is a process or activity that affects an asset or value. See also 'coastal hazards', which are the specific hazards defined in the NSW *Coastal Management Act 2016.*

Intermittently closed and open lakes and lagoons (ICOLL) are those where the entrance may be closed to the sea from time to time and for varying periods, by accretion of a berm. ICOLLs have sensitive water quality because they accumulate loads of sediment and nutrients from the catchment and may have limited water circulation and flushing. The most sensitive waterways listed in the Resilience and Hazards SEPP are all ICOLLs. The catchments of ICOLLs are included in the coastal environment area.

Legacy issues are land-use planning issues caused by past decisions on how and where development occurs. Consequences are often felt decades after the decision and 'inherited' by future users of the land or communities. A common example is historic development in areas now exposed to coastal hazard risks.

Legacy infrastructure is infrastructure relating to a previous land use that is no longer active and, in general, not directly relevant to the present activities on site.

Littoral rainforest is a closed forest ecological community recognised by its closeness to the ocean (generally less than 2 kilometres away) and closed canopy (that is, about 70% of the sky is obscured by tree leaves and limbs). These rainforests are listed as endangered ecological communities under the NSW *Biodiversity Conservation Act 2016.*

Longshore drift – also known as littoral drift – is the sediment moved along a coastline under the action of longshore currents caused by waves.

LGA is a local government area.

Natural features means components and processes present or produced by nature. This includes, but is not limited to, soil types, geology, slopes, vegetation, surface water, drainage patterns, aquifers, recharge areas, climate, floodplains, aquatic life, and wildlife.

Natural features of foreshores are the components and processes present or produced by nature in a foreshore. This can include, but is not limited to, landforms, ecosystems and species, beaches, coastal lakes, estuaries, coastal wetlands, coastal lagoons, and riparian corridors, headlands, rock platforms, shoreline access areas, climate, and habitats.

Passive recreation is generally associated with the use of nature-based settings such as bushland, parks and reserves, beaches and national parks.

Planning proposal is a document and supporting information that explains the intended effect of and justification for a proposed local environmental plan or amendment to a local environmental plan. In some limited circumstances, a planning proposal can also explain the intended effect of and justification for a proposed amendment to a state environmental planning policy.

Ribbon development refers to a line of houses and/or commercial buildings along the coastline, radiating from a human settlement, each being served by individual access.

Riparian relates to the banks of a body of water, such as an estuary, river or creek.

Rock platforms are flat, eroded regions at the bottom of headlands formed by water and wind abrasion.

Scale refers to the size of a building and its elements and its relationship with the surrounding buildings or landscape.

Setback is the horizontal distance from a building to a prescribed boundary (such as a site boundary) or other relevant marker (such as the alignment of houses in a street).

Sea level rise is an increase in the mean level of the oceans. Relative sea level rise happens where there is a local increase in the level of the ocean relative to the land, which might be caused by the ocean rising, the land subsiding, or both.

Sensitive coastal ecosystems is used in these guidelines to refer to any coastal ecosystem that is vulnerable to the effects of human activities and requires more protection and care.

Sensitive receiving environments are parts of the existing environment, such as wetlands, lakes, estuaries and rivers, that are particularly sensitive to pollution and disturbance.

Shoreline recession is a continuing landward movement of the shoreline, or a net landward movement of the shoreline over time.

Significance means the sum of the cultural and natural heritage values of a place (English Heritage 2007). Cultural heritage value has many aspects, including:

- evidential value, including archaeological value, which is the potential of a place to yield primary information about past human activity
- historical value, which is the ways in which it can provide direct links to past people, events and aspects of life
- aesthetic value, including architectural value, which is the ways in which people respond to a place through sensory and intellectual experience of it
- communal value, which is the meanings of a place for the people who identify with it, and communities for whom it is part of their collective memory.

Solar access is the ability of a building or place to receive direct sunlight without obstruction from other buildings or impediments.

Threat, in the coastal management context, is a process or activity that puts pressure on one or more coastal assets or values. Threats may include land uses (for example, housing or recreation), land management, climate change, industrial discharges, stormwater runoff, overfishing and invasive species.

Threatened ecological community is defined by the *Biodiversity Conservation Act 2016* as a critically endangered ecological community, an endangered ecological community or a vulnerable ecological community listed in Schedule 2 of that Act.

Threatened species is defined by the *Biodiversity Conservation Act 2016* as a critically endangered species, an endangered species or a vulnerable species listed in Schedule 1 of that Act.

Tidal inundation is the inundation of land by tidal action under average meteorological conditions and the incursion of sea water onto low-lying land that is not normally inundated during a high sea level event such as a king tide or because of longer-term sea level rise.

Urban design is an interdisciplinary practice that draws together elements of many built environment professions, including landscape architecture, urban planning, architecture, civil and municipal engineering.

Urban heat islands are areas that are hotter than natural environments due to hard, sealed surfaces and a lack of vegetation or 'green infrastructure' such as tree canopies, vegetated roofs and walls and waterways. This is because hard surfaces absorb, store and radiate heat, while green infrastructure reflects heat, provides shade and releases water into the atmosphere. Urban heat islands make higher temperatures and extreme hot weather events more severe and difficult to manage, placing more people at risk of exposure.

Vulnerable communities are those that are susceptible to the effects of a hazard, based on physical, social, economic and environmental factors. Communities of greater vulnerability may have one or more of the following characteristics:

- changes in population
- significant numbers of older or young persons
- lower socio-economic groups
- regional location or remoteness from emergency services
- people with mobility issues
- people with language barriers
- isolation during and after a hazard event.

Water-sensitive urban design is water cycle management within the built environment that seeks to replicate natural processes when treating water.

For more definitions for the coastal zone, see the Coastal Management Glossary (PDF 254KB).

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Appendix

Appendix 1: Assessment checklist for planning proposals

Hierarchy of coastal management areas:

1. CWLRA = coastal wetlands and littoral rainforests area
2. CVA = coastal vulnerability area
3. CEA = coastal environment area
4. CUA = coastal use area

Outcome A. Protect and enhance coastal environmental values			
Requirement	**Relevant coastal management area(s)**	**Applicable to planning proposal (Y/N)**	**Planning proposal is consistent with guidelines (Y/N) If 'No', justify this**
Outcome A.1 Protect coastal ecosystems			
A.1a Avoid development on undeveloped headlands and significant coastal landforms.	CVA, CEA		
A.1b Do not increase development or intensify land uses where there is existing development on headlands and significant coastal landforms.	CVA, CEA		
A.1c Identify, protect and enhance sensitive coastal ecosystems including coastal wetlands, littoral rainforests and other coastal threatened ecological communities that may be affected by development.	CWLRA, CEA		
A.1d Maintain and protect the presence of beaches, rock platforms, coastal dunes, riparian vegetation and the natural features of foreshores, including along estuaries and coastal lakes.	CWLRA, CVA, CEA		
A.1e Use environmental buffers and limit the number of access points and pathways to protect coastal ecosystems. In some cases, it may not be appropriate to allow public access to areas with highly sensitive ecosystems or animal populations.	CWLRA, CEA, CUA		
A.1f Consider if the planning proposal is needed or if development zones could be better located to minimise effects on biodiversity.	CWLRA, CEA, CUA		
A.1g Avoid development that may disturb, expose or drain areas of Class 1 and Class 2 acid sulfate soils.	CWLRA, CEA, CUA		
A.1h Consider direct and indirect effects of development, including any necessary infrastructure, on water quality, water quantity and hydrological flows of waterways and groundwater.	CEA, CUA		

Outcome A. Protect and enhance coastal environmental values			
Requirement	**Relevant coastal management area(s)**	**Applicable to planning proposal (Y/N)**	**Planning proposal is consistent with guidelines (Y/N) If 'No', justify this**
Outcome A.2 Protect coastal wetlands and littoral rainforests			
A.2a Identify coastal wetlands and littoral rainforests, including areas that could be rehabilitated or restored in the future, and do not increase development or intensify land uses in these areas.	CWLRA		
A.2b Allow for the adaptive management of stormwater run-off so that the quality of water leaving the site is better than pre-development quality to lessen effects on coastal wetlands or other sensitive receiving environments.	CWLRA, CEA, CUA		
A.2c Provide environmental buffers and riparian corridors that enable the long-term management and protection of areas of biodiversity and ecosystem integrity.	CWLRA, CVA, CEA, CUA		
A.2d Identify and protect areas that allow for landward migration pathways for coastal wetlands to respond to climate change.	CWLRA, CEA		
A.2e Exclude land uses that affect the natural state of coastal wetlands and littoral rainforests or that will make it harder to rehabilitate these ecosystems in the future.	CWLRA		
Outcome A.3 Protect marine parks and aquatic reserves			
A.3a Avoid development and land uses that affect the environmental, economic, social and cultural values of marine parks and aquatic reserves.	CEA, CUA		
A.3b Protect the ecological health of marine parks and aquatic reserves, including providing for riparian vegetation and buffers in their catchments.	CEA, CUA		

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Outcome B. Ensure the built environment is appropriate for the coast and local context			
Requirement	**Relevant coastal management area(s)**	**Applicable to planning proposal (Y/N)**	**Planning proposal is consistent with guidelines (Y/N) If 'No', justify this**
Outcome B.1 Respond to and protect elements that make the place special			
B.1a Integrate development within the natural topography of the site and ensure land use, building scale and height respond sympathetically to coastal landforms.	CWLRA, CVA, CEA, CUA		
B.1b Ensure the intended form and footprint of development does not dominate coastal elements, including foreshores, public spaces and other areas of natural beauty.	CWLRA, CVA, CEA, CUA		
B.1c Incorporate adaptive, water-sensitive urban design into the development footprint to reduce run-off and manage water quality within receiving environments.	CWLRA, CEA, CUA		
B.1d Ensure that lot sizes, building heights and density are appropriate for the coastal settlement, and complement the existing or desired local character, supported by place-based strategies.	CEA, CUA		
B.1e Avoid development that would harm geological features and geoheritage.	CEA, CUA		
Outcome B.2 Ensure urban development complements coastal scenic values			
B.2a Limit ribbon development and urban sprawl wherever possible. In certain locations, place-based strategies may support increased development density and building heights as a better response to urban growth.	CEA, CUA		
B.2b Use greenbelts to create, maintain and mark out separation between settlements.	CEA, CUA		
B.2c Consider effects on scenic values and maintain publicly accessible views to significant landmarks.	CEA, CUA		
B.2d Ensure that building heights consider the effect on views from different vantage points.	CEA, CUA		
B.2e Retain or create views from public spaces. Prioritise this over creating views from private property.	CEA, CUA		
B.2f Provide for active transport links along foreshores, including along estuaries and coastal lakes, and between settlements to increase public access and amenity.	CWLRA, CVA, CEA, CUA		

Outcome C. Protect and enhance the social and cultural values of the coastal zone			
Requirement	**Relevant coastal management area(s)**	**Applicable to planning proposal (Y/N)**	**Planning proposal is consistent with guidelines (Y/N) If 'No', justify this**
Outcome C.1 Protect and promote heritage values			
C.1a Ensure development does not harm heritage values or sites.	CWLRA, CVA, CEA, CUA		
C.1b Work collaboratively with local Aboriginal people before and throughout the planning proposal process.	CWLRA, CVA, CEA, CUA		
C.1c With permission and guidance from local Traditional Custodians, identify and emphasise significant features of coastal land and sea Country.	CWLRA, CVA, CEA, CUA		
C.1d With permission and guidance from local Traditional Custodians, identify and protect sacred and significant areas through the appropriate siting of development.	CWLRA, CVA, CEA, CUA		
C.1e Ensure land use, building type, scale and height respond to heritage items and areas.	CEA, CUA		
Outcome C.2 Provide public access to significant coastal assets			
C.2a Protect and, where practical, improve, public amenity, access to and use of beaches, foreshores, rock platforms, geoheritage sites and headlands, unless you must restrict access for public safety or for environmental or cultural protection. In doing so, consider both current and projected future coastal hazards.	CVA, CEA		
C.2b Identify opportunities to maintain and improve existing public access to beaches, foreshores, coastal waters and coastal lakes that support active and passive recreation activities, where this does not interfere with existing coastal industries.	CWLRA, CVA, CEA, CUA		
C.2c Consolidate access points and consider alternative access to protect sacred and significant Aboriginal cultural areas.	CWLRA, CVA, CEA, CUA		
C.2d Maintain and improve foreshore access and connections to existing or proposed networks of public open spaces. This includes waterways, riparian areas, bushland and parks for active and passive recreation.	CWLRA, CVA, CEA, CUA		
C.2e Consider opportunities to protect and improve habitat connectivity through settlements, such as those described in the *Greener Places Design Guide.*	CWLRA, CEA, CUA		

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Outcome C. Protect and enhance the social and cultural values of the coastal zone			
Requirement	**Relevant coastal management area(s)**	**Applicable to planning proposal (Y/N)**	**Planning proposal is consistent with guidelines (Y/N) If 'No', justify this**
C.2f Avoid development on coastal dunes and foreshore reserves unless it is for essential public purposes, such as surf life-saving club buildings. Any building or structure located on dunes must be of lightweight construction and relocatable.	CVA, CEA		
C.2g Define the boundaries of development sites with a public edge – for example, a pedestrian pathway or public laneway.	CEA, CUA		
C.2h Prevent the privatisation of coastal open space by ensuring development next to foreshores is set back, maintains public access and accessibility, and provides links and connections to other public accessways.	CEA, CUA		
Outcome C.3 Protect public amenity			
C.3a Avoid development that will overshadow the beach, foreshore or public domain. Apply the standard that there must be no overshadowing before 4 pm (midwinter) and 7 pm (Eastern Daylight Saving Time).	CEA, CUA		
C.3b Protect the amenity of public spaces from buildings, structures or land uses that may be visually and/or acoustically intrusive or create wind funnels.	CEA, CUA		

Outcome D. Support sustainable coastal economies			
Requirement	**Relevant coastal management area(s)**	**Applicable to planning proposal (Y/N)**	**Planning proposal is consistent with guidelines (Y/N) If 'No', justify this**
Outcome D.1 Support sustainable industries and recreational activities that depend on the coast			
D.1a Ensure that development will not harm sustainable coastal industries needing waterfront access, or recreational use of the coastal environment.	CEA, CUA		
D.1b Protect and improve essential facilities such as access ramps and jetties for sustainable coastal industries needing waterfront access.	CEA, CUA		
D.1c Ensure access ramps, jetties, pontoons, groynes and other structures do not impede navigation on the water or harm coastal landforms or impair processes such as surf breaks.	CWLRA, CVA, CEA, CUA		
D.1d Ensure that the proposal considers how development in a waterway may affect the land.	CEA, CUA		
Outcome D.2 Promote green infrastructure			
D.2a Do not allow development that is likely to significantly reduce connectivity of existing green infrastructure.	CEA, CUA		
D.2b Provide for diverse green infrastructure that can support the changing needs of current and future communities, and provide tourism and recreational opportunities.	CEA, CUA		

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Outcome E. Respond to coastal hazards			
Requirement	**Relevant coastal management area(s)**	**Applicable to planning proposal (Y/N)**	**Planning proposal is consistent with guidelines (Y/N) If 'No', justify this**
Outcome E.1 Respond to coastal processes			
E.1a Planning proposals that affect land within a coastal hazard and risk area must not alter coastal processes in a way that harms the natural environment or other land.	CWLRA, CVA, CEA, CUA		
E.1b Exclude development in areas affected by a current or projected future coastal hazard that is likely to increase the risk of coastal hazards on that land or other land.	CWLRA, CVA, CEA, CUA		
E.1c Locate or consolidate development in areas with little or no exposure to current and projected future coastal hazards, to ensure public safety and prevent risks to life.	CWLRA, CVA, CEA, CUA		
E.1d Do not increase development potential or intensify land uses in a coastal hazard or risk area.	CWLRA, CVA, CEA, CUA		
Outcome E.2 Account for natural hazard risks			
E.2a Identify areas on and near the proposal that are affected by current or projected future coastal hazards. Ensure that the proposal is compatible with any identified threat or risk.	CWLRA, CVA, CEA, CUA		
E.2b Account for potential interaction between coastal hazards and other current and future natural hazards. This includes flooding, bushfires, landslip, heatwaves, severe storms, east coast lows and cyclones. Refer to the *Strategic Guide to Planning for Natural Hazards.*	CWLRA, CVA, CEA, CUA		
E.2c Manage natural hazard risk within the development site. Avoid using public space or adjoining land to lessen risk.	CWLRA, CVA, CEA, CUA		
Outcome E.3 Account for climate change			
E.3a Demonstrate that the proposal applies a 100-year planning horizon for the full range of climate change projections for coastal hazards. This approach recognises that sea level is projected to continue to rise for centuries because of climate change.	CWLRA, CVA, CEA, CUA		
E.3b Consider how climate change could affect the risk profile of existing natural hazards and create new vulnerabilities and exposure for the proposal in the future.	CWLRA, CVA, CEA, CUA		

Outcome E. Respond to coastal hazards			
Requirement	**Relevant coastal management area(s)**	**Applicable to planning proposal (Y/N)**	**Planning proposal is consistent with guidelines (Y/N) If 'No', justify this**
Outcome E.4 Provide sustainable defences to coastal hazards			
E.4a Reduce exposure to coastal hazards by protecting, restoring or improving natural defences. This includes coastal dunes, vegetation, coastal floodplains and coastal wetlands, where suitable.	CWLRA, CVA, CEA, CUA		
E.4b If natural defences are not possible, reduce exposure to coastal hazards without significantly degrading: • **biological diversity and ecosystem integrity** • **ecological, biophysical, geological and geomorphological coastal processes** • **beach and foreshore amenity, or the social and cultural value of these areas** • **public safety and access to, or use of, beaches or headlands.**	CWLRA, CVA, CEA, CUA		
Outcome E.5 Protect essential infrastructure			
E.5a Locate and design essential infrastructure to reduce vulnerability to current and projected future coastal hazards. Consider the effects of climate change over at least a 100-year planning horizon.	CWLRA, CVA, CEA, CUA		
E.5b Where exposure to coastal hazards cannot be avoided, prepare adaptation plans for essential service infrastructure. These plans should be consistent with any applicable coastal management program.	CWLRA, CVA, CEA, CUA		
E.5c Consult local Aboriginal land management experts and emergency management agencies on how to strategically locate access routes and other essential infrastructure.	CWLRA, CVA, CEA, CUA		
Outcome E.6 Change land uses to manage legacy issues and avoid creating new ones			
E.6a Ensure the proposal will not require coastal management interventions to remain viable over its expected lifespan.	CWLRA, CVA, CEA, CUA		
E.6b Consider the potential legacy effects of the proposal and if the proposed land uses or development will create a social, environmental, economic or cultural burden for future generations.	CWLRA, CVA, CEA, CUA		
E.6c Consider if the proposed change of land use could remove redundant legacy infrastructure or reduce existing legacy effects.	CWLRA, CVA, CEA, CUA		

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Appendix 2: Assessment checklist for urban design

Hierarchy of coastal management areas:

1. CWLRA = coastal wetlands and littoral rainforests area
2. CVA = coastal vulnerability area
3. CEA = coastal environment area
4. CUA = coastal use area

4.2 Design guidance for the natural environment			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.2.1 Base considerations on a hierarchy of landform, then landscape, then built form			
4.2.1a Site and orientate structures to reinforce natural coastal landform.	CWLRA, CVA, CEA, CUA		
4.2.1b Account for dynamic coastal processes and the changing nature of the landform under projected climate change scenarios and effects.	CWLRA, CVA, CUA, CEA		
4.2.1c Integrate public spaces and infrastructure with coastal landforms and systems.	CEA, CUA		
4.2.1d Create block and lot patterns responsive to topography, water flow, natural coastal assets and cultural landscapes.	CEA, CUA		
4.2.1e Maintain the ecological integrity of the foreshore and headlands, and retain public views of these coastal landscapes. Prioritise this over creating views and outlooks from private properties.	CVA, CEA, CUA		
4.2.2 Protect and enhance water quality, hydrological systems and coastal processes			
4.2.2a Support and incorporate water-sensitive urban design approaches.	CWLRA, CVA, CEA, CUA		
4.2.2b Identify and protect sensitive downstream environments such as marine parks, aquatic reserves, coastal wetlands, coastal lakes and national parks from adverse effects on water quality and quantity, and hydrological flows.	CWLRA, CVA, CEA, CUA		
4.2.2c Consider opportunities to re-naturalise and engineer hydrology, hydraulics and flow regimes to support natural coastal and floodplain processes (for example, floodplain inundation, saltmarsh inundation, longshore drift).	CWLRA, CVA, CEA, CUA		
4.2.2d Remediate or remove legacy infrastructure that may be harming coastal environments and waterways.	CWLRA, CVA, CEA, CUA		

4.2 Design guidance for the natural environment			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.2.3 Identify, protect and enhance sensitive coastal ecosystems and threatened ecological communities			
4.2.3a Minimise disturbance to sensitive coastal ecosystems by grouping structures and providing common access points (such as walkways). Avoid vehicular access within sensitive coastal ecosystems.	CWLRA, CVA, CEA, CUA		
4.2.3b Avoid and minimise effects on areas of high biodiversity value.	CWLRA, CVA, CEA, CUA		
4.2.3c Restore, protect and improve sensitive coastal ecosystems – such as intertidal foreshores, coastal wetlands, littoral rainforests and riparian habitats – and increase connectivity between remnant areas where possible.	CWLRA, CVA, CEA, CUA		
4.2.3d Restore the natural characteristics of foreshore areas wherever possible.	CVA, CEA		
4.2.3e Provide vegetated setbacks to protect coastal ecosystems.	CWLRA, CVA, CEA, CUA		
4.2.3f Identify and plan for landward migration pathways for coastal wetlands to respond to climate change.	CWLRA, CEA		
4.2.3g Consider connectivity between the land and waterways holistically, including the effects of the development on ecological connectivity and ecosystem functions.	CWLRA, CEA		
4.2.3h Adopt lighting design that reduces light pollution to minimise effects on wildlife – refer to the *National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds*.	CWLRA, CVA, CEA, CUA		
4.2.3i Adopt acoustic design that minimises effects of construction and operational noise on wildlife.	CWLRA, CVA, CEA, CUA		
4.2.3j Naturalise drainage patterns and channels to manage overland flow, increase civic amenity, improve ecological connectivity and restore ecosystems.	CWLRA, CEA, CUA		

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4.2 Design guidance for the natural environment			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.2.4 Ensure that the natural coastal environment is integrated into built coastal environments			
4.2.4a Maintain the presence of beaches, dune systems, undeveloped headlands and other natural features of foreshores.	CVA, CEA		
4.2.4b Encourage filtered views throughout the built environment to reinforce the presence of coastal landforms.	CEA, CUA		
4.2.4c Use landscaping and planting of locally endemic species to connect habitat, water systems and settlements.	CWLRA, CVA, CEA, CUA		
4.2.4d Use planting of locally endemic species and landscape design to screen built structures that may be viewed from the foreshore or coastal waterways.	CEA, CUA		
4.2.4e Mitigate urban heat island and climate change effects in built coastal environments by preserving and expanding tree canopy cover, riparian vegetation, wildlife corridors and habitat.	CWLRA, CEA, CUA		
4.2.5 Use nature-based solutions as the first option to address environmental challenges, avoiding hard engineering solutions where possible			
4.2.5a Naturalise riparian corridors to support coastal processes and mitigate the effect of weather events, including on coastal floodplains.	CWLRA, CVA, CEA, CUA		
4.2.5b Site infrastructure and structures (for example, foreshore facilities) to minimise environmental impact and enable natural tidal flows, propagation of marine life and longshore drift.	CWLRA, CVA, CEA, CUA		
4.2.5c Encourage locally endemic planting and control weeds to promote and restore the functions and resilience of coastal dune systems.	CVA, CEA		
4.2.5d Improve the capacity of soils to absorb and filter water (for example, encourage vegetated swales and pervious surfaces).	CWLRA, CEA, CUA		
4.2.5e Avoid reclaiming land or constructing hard barriers. Instead, create re-naturalised zones to allow adaptation to coastal processes.	CWLRA, CVA, CEA, CUA		
4.2.5f When natural solutions are not possible, consider using techniques to reduce the environmental effect of engineering solutions, such as those described in the *Environmentally Friendly Seawall Guideline*.	CWLRA, CVA, CEA, CUA		

4.3 Design guidance for the built environment			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.3.1 Use built form to reinforce the beauty and character of coastal places			
4.3.1a Use building type, scale, height and aspect to ensure development integrates with, and does not dominate, coastal landforms and other elements of the coastal environment (for example, keep building mass below tree canopy and ridge lines).	CWLRA, CVA, CEA, CUA		
4.3.1b Orient streets and structures towards significant features of the coast and to capture sea breezes for passive cooling.	CUA		
4.3.1c Protect and enhance view corridors to and from the foreshore, water bodies and natural features.	CEA, CUA		
4.3.1d Locate and design development to limit the visual intrusion of buildings when viewed from public spaces, and the overshadowing of beaches, foreshores and the public domain before 4 pm (midwinter) and 7 pm (Eastern Daylight Saving Time)	CEA, CUA		
4.3.1e Create built form that responds to, connects with and celebrates the cultural heritage of coastal Aboriginal peoples.	CWLRA, CVA, CEA, CUA		
4.3.1f Use materials that are resilient, sustainable and that weather well in coastal environments.	CWLRA, CVA, CEA, CUA		
4.3.1g Respond to the natural form of coastal landscapes and minimise cut and fill wherever possible.	CEA, CUA		
4.3.1h Avoid materials that are highly reflective. Use materials, finishes and colours that complement the coastal landscape.	CEA, CUA		
4.3.1i Provide green infrastructure to meet local needs for green space and tree canopy, in keeping with the principles of the *Greener Places Design Guide*.	CEA, CUA		

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4.3 Design guidance for the built environment			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.3.2 Ensure connectivity through and between coastal places			
4.3.2a Create continuous coastal connectivity (for example, by using natural pathways and boardwalks).	CWLRA, CVA, CEA, CUA		
4.3.2b Ensure local connectivity networks link transport nodes, settlement centres and significant coastal features.	CWLRA, CEA, CUA		
4.3.2c Design walkable access ways and road networks in response to significant coastal landforms and foreshore areas.	CWLRA, CVA, CEA		
4.3.2d Use open spaces to link significant natural, cultural and heritage features (for example, coastal walks, songlines, heritage trails).	CWLRA, CVA, CEA, CUA		
4.3.3 Ensure civic amenity and appropriate access to the coastal environment			
4.3.3a Prioritise walking (including all forms of equitable access), cycling and public transport over movement and parking for private vehicles along coastal foreshores.	CWLRA, CVA, CEA, CUA		
4.3.3b Provide clear and limited entry points to coastal environments to protect coastal vegetation, sensitive coastal ecosystems and important habitat, such as for migratory species.	CWLRA, CVA, CEA		
4.3.3c Restrict vehicular entries and encourage non-vehicular access to, and within, the coastal environment.	CWLRA, CVA, CEA, CUA		
4.3.3d Minimise and elevate roads, crossings and walkways over waterways and water bodies.	CWLRA, CVA, CEA, CUA		
4.3.3e In high-use areas such as foreshores, if space allows, create distinct pedestrian walks and cycle paths, separated from busy roads. In areas with more limited space, separate roads from combined pedestrian and cycle paths.	CWLRA, CVA, CEA, CUA		
4.3.3f Protect the character of town centre and foreshore access roads by ensuring development fronting onto these roads is consistent with the existing or desired local character.	CEA, CUA		
4.3.3g Where vehicular traffic ends, ensure pedestrian and cycle movement can continue to provide access to the coastal environment.	CWLRA, CVA, CEA, CUA		
4.3.3h With permission and guidance from local Traditional Custodians, protect sacred and significant areas through siting and consolidating access points appropriately.	CWLRA, CVA, CEA, CUA		

4.3 Design guidance for the built environment			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.3.4 Create spatial frameworks that are resilient to coastal hazards			
4.3.4a Locate development, essential services and infrastructure away from coastal hazard and risk areas wherever possible.	CVA, CEA, CUA		
4.3.4b Accommodation, services and facilities for vulnerable communities must be located landward of coastal hazard and risk areas.	CVA, CEA, CUA		
4.3.4c Ensure that the location and design of development reduces exposure to risks from coastal hazards over the life of the development.	CVA, CEA, CUA		
4.3.4d Ensure service and infrastructure design considers risk to life, evacuation of public property and safety from coastal hazards, without relying on emergency responses, particularly during periods of peak demand.	CVA, CEA, CUA		
4.3.4e If development to reduce exposure to coastal hazards will increase erosion of the beach and/or adjacent land, provide for the restoration of the beach and/or adjacent land.	CVA, CEA, CUA		
4.3.4f Allow for temporary, seasonal and low-impact uses in coastal hazard and risk areas, maintaining the land in public ownership.	CVA, CEA, CUA		
4.3.4g Prioritise actions that support the continued functionality of essential infrastructure during and immediately after a coastal hazard emergency.	CVA, CEA, CUA		
4.3.5 If the proposal will locate structures in areas affected by coastal and other natural hazards, ensure that they can be adapted, relocated and transformed.			
4.3.5a Locate development appropriately in relation to projected hazard timelines. Refer to applicable coastal management programs, policies and hazard studies adopted by council.	CVA, CEA, CUA		
4.3.5b Development must not increase the risk or effect of coastal hazards, either by intensifying land use or by altering coastal processes in a way that harms the natural environment or other land.	CVA, CEA, CUA		
4.3.5c In areas at immediate or short-term risk of coastal hazard impact, retrofit, upgrade, relocate or remove structures to protect life and property, and to improve resilience to climate change.	CVA, CEA, CUA		
4.3.5d Encourage design of buildings and structures that are modular, detachable and relocatable.	CVA, CEA, CUA		

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4.3 Design guidance for the built environment			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.3.5e In coastal hazard and risk areas, ensure that buildings, structures and works are engineered to withstand or accommodate coastal hazards for their design life.	CVA, CEA, CUA		
4.3.5f Ensure that infrastructure design and construction use appropriate climate-resilient materials and treatments, such as those described in the *Institute of Public Works Engineering Australia Practice Notes 12.1* and *12.2* (as modified from time to time).	CVA, CEA, CUA		

4.4 Design guidance for the social and economic context			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.4.1 Encourage sustainable, productive use of the natural coastal environment			
4.4.1a Maintain and improve, where possible, sustainable access for recreational and commercial fishing, including boat maintenance facilities.	CEA, CUA		
4.4.1b Support adaptive re-use of redundant maritime or industrial infrastructure.	CEA, CUA		
4.4.1c Support the changing demographics and economics of coastal areas by providing diverse commercial and retail spaces.	CUA		
4.4.1d Provide tourism and education opportunities associated with iconic local industries, such as aquaculture.	CUA		
4.4.1e Incorporate local environmental and cultural skills into built outcomes (for example, murals by local artists or a living breakwater propagated with oysters from local farmers).	CUA		
4.4.1f Deliver social infrastructure (such as public toilets and litter bins) to support the sustainable use of and visitation to natural assets.	CEA, CUA		
4.4.1g Provide all-weather access to amenities such as boat ramps, watercraft storage racks, showers and changing facilities to promote year-round visitation.	CEA, CUA		
4.4.1h Use environmental remediation as a local attraction – for example, by providing boardwalks across remediated land converted into coastal wetlands.	CWLRA, CEA, CUA		
4.4.2 Ensure coastal infrastructure delivers civic space and community assets			
4.4.2a Maintain public ownership of foreshores and reserves.	CWLRA, CVA, CEA		
4.4.2b Provide, improve and maintain coastal infrastructure to enable access (for example, upgrade paths along breakwaters and estuary foreshores to enable safe access for all).	CWLRA, CVA, CEA, CUA		
4.4.2c Provide social amenity and educational engagement opportunities in re-naturalised coastal spaces (for example, engineered benched seating merging into natural rock platform or tidal pools for marine habitat).	CEA, CUA		
4.4.2d Create high-quality urban amenity and recreational infrastructure (for example, showers and changing facilities, bicycle and surf craft racks, and seating along coastal walkways).	CWLRA, CVA, CEA, CUA		

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4.4 Design guidance for the social and economic context			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.4.2e Provide management facilities to support and enable community stewardship of coastal places (for example, equipment storage for surf lifesaving, bushcare or community garden groups).	CEA, CUA		
4.4.2f Promote adaptive reuse and integration of heritage items into development where appropriate.	CUA		
4.4.3 Acknowledge and protect coastal Aboriginal peoples' spiritual, social, cultural, customary and economic connection to coastal Country			
4.4.3a Enable Traditional Custodians to carry out traditional Aboriginal land management practices within coastal land and sea Country.	CWLRA, CVA, CEA, CUA		
4.4.3b With permission and guidance from Traditional Custodians, help protect coastal places with cultural significance for local Aboriginal communities (for example, scar trees, middens, tree groves, rock carvings, headlands and beaches).	CWLRA, CVA, CEA, CUA		
4.4.3c Where appropriate, work with Traditional Custodians to identify and emphasise culturally significant coastal places in a way that celebrates and supports ongoing cultural connection and practice.	CWLRA, CVA, CEA, CUA		
4.4.3d Where appropriate, introduce interpretive elements into the public realm to engage and educate the community about local Aboriginal culture and heritage values.	CWLRA, CVA, CEA, CUA		
4.4.3e Ensure built form responds to Country and the Aboriginal cultural landscape.	CWLRA, CVA, CEA, CUA		
4.4.4 Support community adaptation to, and management of, current and future coastal hazards			
4.4.4a Development in coastal hazard and risk areas must be consistent with any relevant certified coastal management program. Coastal management programs include adaptation strategies that consider a range of options – from hazard avoidance, accommodation and protection, to managed retreat and loss acceptance.	CWLRA, CVA, CEA, CUA		
4.4.4b For existing structures within coastal hazard and risk areas and foreshore setback areas, develop plans for adaptive management that minimise the effect on natural and cultural values, as well as expense to the community (current and future).	CWLRA, CVA, CEA, CUA		

4.4 Design guidance for the social and economic context			
Design objective	**Relevant coastal management area(s)**	**Applicable to design (Y/N)**	**The design is consistent with guidelines (Y/N) If 'No', justify this**
4.4.4c Support greater public awareness, education and understanding of coastal processes and management actions.	CWLRA, CVA, CEA, CUA		
4.4.4d Include community consultation in the design development process, establishing clear opportunities for continued engagement.	CWLRA, CVA, CEA, CUA		

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COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION SUMMARY

Rates Current At April 2026

Ref	Location	Total Cost $
1	**Site 1**	**384,382.40**
2	**Site 2**	
2A	Demolish Yacht Club and Implement New Relocated Yacht Club	6,396,201.40
2B	Demolish Croquet Club and New Revegetation and Sand Nourishment	2,027,491.50
2C	Protect Qahwa Heritage Cafe	2,192,349.80
3	**Site 3**	**18,217,067.20**
4	**Site 4**	
4A	Remove and Re-establish Carpark	10,732,946.20
4B	Replace Carpark with Dunes including Revegetation and Sand Nourishment	999,580.30
5	**Site 5**	
5A	Improvements to Estuary	987,518.40
5B	New Boardwalk with Trail and Viewing Deck	11,453,225.00
ESTIMATED NET COST		
MARGINS & ADJUSTMENTS		
Medium and Long Term Moves		Excl.
Professional Fees and Charges		Excl.
Escalation beyond mid 2026		Excl.
Goods & Services Taxation		Excl.
ESTIMATED TOTAL COST		

COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
1 Site 1

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
PR	**Preliminaries**				
27	Contractors Preliminaries and Supervision	Item			40,000.00
28	Traffic and Pedestrian Management	Item			5,000.00
	PR - Preliminaries				**45,000.00**
DE	**Demolition and Site Clearance**				
1	Clear site of rubbish and debris	Item			1,800.00
24	Allowance for removal and relocation of existing fencing (Provisional Sum)	Item			15,000.00
44	Allowance for unforeseen demolition including disposal of debris off site	Item			4,500.00
	DE - Demolition and Site Clearance				**21,300.00**
EA	**Earthworks**				
84	No allowance for bulk excavation or similar - existing levels to remain	Note			Excl.
	EA - Earthworks				**Excl.**
RV	**Revegetation**				
21	Revegetation works including cultivation of existing site soils, planting tubestocks at 1 / 5m², etc.	m²	15,729	5.60	88,082.40
23	No allowance for mulch or irrigation system to revegetation areas	Note			Excl.
	RV - Revegetation				**88,082.40**
SN	**Sand Nourishment**				
22	Allowance for supply and placement of sand for nourishment to dunes (Provisional Sum)	Item			150,000.00
	SN - Sand Nourishment				**150,000.00**
SW	**Sea Wall**				
80	No allowance for new sea wall	Note			Excl.
	SW - Sea Wall				**Excl.**
MT	**Medium Term Key Moves**				
25	No allowance for Medium Term Key Moves	Note			Excl.
	MT - Medium Term Key Moves				**Excl.**
LT	**Long Term Key Moves**				
26	No allowance for Long Term Key Moves	Note			Excl.
	LT - Long Term Key Moves				**Excl.**
CT	**Contingencies**				
29	Design Development Contingency	Item			40,000.00
30	Construction Contingency	Item			40,000.00
	CT - Contingencies				**80,000.00**
SITE 1					**384,382.40**

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COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
2 Site 2
2A Demolish Yacht Club and Implement New Relocated Yacht Club

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
PR	**Preliminaries**				
27	Contractors Preliminaries and Supervision	Item			690,000.00
28	Traffic and Pedestrian Management	Item			50,000.00
	PR - Preliminaries				**740,000.00**
DE	**Demolition and Site Clearance**				
1	Clear site of rubbish and debris	Item			1,000.00
7	Take up existing road pavement including kerbing and dispose off site	m²	1,112	43.00	47,816.00
10	Take up existing unsealed road pavement and dispose off site	m²	1,324	13.80	18,271.20
12	Take up existing croquet lawns including concrete edging and dispose off site - assumed natural turf court construction	m²	2,576	22.50	57,960.00
13	Take up existing softscape and dispose off site (lawns, garden beds, etc.)	m²	3,843	18.50	71,095.50
15	Take up existing footpath pavement and dispose off site	m²	366	24.80	9,076.80
9	Demolish existing yacht club buildings and dispose debris off site	m²	900	110.00	99,000.00
31	Demolish existing masonry wall and dispose off site	m	49	85.00	4,165.00
44	Allowance for unforeseen demolition including disposal of debris off site	Item			10,000.00
62	No allowance for handling of asbestos	Note			Excl.
63	No allowance for handling of contaminated materials	Note			Excl.
85	No allowance for removal of large trees	Note			Excl.
	DE - Demolition and Site Clearance				**318,384.50**
EA	**Earthworks**				
87	No allowance for bulk excavations to revegetation zones (sand nourishment only)	Note			Excl.
	EA - Earthworks				**Excl.**
PV	**Pavements**				
39	Allowance for construction of unsealed pavement as launch zone to Yacht Club	m²	1,324	60.00	79,440.00
40	Allowance for construction of sealed asphalt carpark to Yacht Club including excavation, base preparation, sealing, line marking, etc.	m²	841	140.00	117,740.00
88	No allowance for new footpath and viewing decks - future works	Note			Excl.
	PV - Pavements				**197,180.00**
LA	**Landscaping**				
47	Allowance for soft and hard landscaping to new Yacht Club (Provisional Sum)	Item			50,000.00
86	No allowance for relocation or adjustment of existing large pine trees to suit new levels - future works	Note			Excl.

COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES
RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
2 Site 2
2A Demolish Yacht Club and Implement New Relocated Yacht Club (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
89	No allowance for new trees along Flinders Parade / Bridge Terrace - future works	Note			Excl.
	LA - Landscaping				**50,000.00**
RV	**Revegetation**				
21	Revegetation works including cultivation of existing site soils, planting tubestocks at 1 / 5m², etc.	m²	8,064	5.60	45,158.40
52	Allowance for ripping subgrade and providing supplementary topsoil where buildings and pavements demolished	m²	3,701	28.50	105,478.50
23	No allowance for mulch or irrigation system to revegetation areas	Note			Excl.
	RV - Revegetation				**150,636.90**
SN	**Sand Nourishment**				
22	Allowance for supply and placement of sand for nourishment to dunes (Provisional Sum)	Item			100,000.00
	SN - Sand Nourishment				**100,000.00**
SW	**Sea Wall**				
80	No allowance for new sea wall	Note			Excl.
	SW - Sea Wall				**Excl.**
BF	**Built Form**				
32	Allowance for construction of new Yacht Club building complete and associated sheds	m²	900	3,950.00	3,555,000.00
	BF - Built Form				**3,555,000.00**
SC	**Service Connections**				
33	Allowance for new electrical connection to new building	Item			80,000.00
34	Allowance for new sewer connection to new building	Item			35,000.00
35	Allowance for new water connection to new building	Item			20,000.00
36	Allowance for grease trap arrestor to new building	Item			30,000.00
38	No allowance for gas service to new building	Note			Excl.
	SC - Service Connections				**165,000.00**
SV	**Services**				
75	No allowance for lighting to Yacht club carpark	Note			Excl.
	SV - Services				**Excl.**
SD	**Stormwater Drainage**				
37	Allowance for new stormwater connection to new building	Item			15,000.00
77	Allowance for stormwater infrastructure to Yacht club carpark - assume mostly overland flow	Item			25,000.00
	SD - Stormwater Drainage				**40,000.00**
MT	**Medium Term Key Moves**				
25	No allowance for Medium Term Key Moves	Note			Excl.
	MT - Medium Term Key Moves				**Excl.**

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COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
2 Site 2
2A Demolish Yacht Club and Implement New Relocated Yacht Club (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
LT	**Long Term Key Moves**				
26	No allowance for Long Term Key Moves	Note			Excl.
	LT - Long Term Key Moves				**Excl.**
CT	**Contingencies**				
29	Design Development Contingency	Item			540,000.00
30	Construction Contingency	Item			540,000.00
	CT - Contingencies				**1,080,000.00**
DEMOLISH YACHT CLUB AND IMPLEMENT NEW RELOCATED YACHT CLUB					**6,396,201.40**

COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
2 Site 2
2B Demolish Croquet Club and New Revegetation and Sand Nourishment

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
PR	**Preliminaries**				
27	Contractors Preliminaries and Supervision	Item			220,000.00
28	Traffic and Pedestrian Management	Item			20,000.00
	PR - Preliminaries				**240,000.00**
DE	**Demolition and Site Clearance**				
1	Clear site of rubbish and debris	Item			1,000.00
12	Take up existing croquet lawns including concrete edging and dispose off site - assumed natural turf court construction	m²	3,108	22.50	69,930.00
13	Take up existing softscape and dispose off site (lawns, garden beds, etc.)	m²	3,223	18.50	59,625.50
15	Take up existing footpath pavement and dispose off site	m²	439	24.80	10,887.20
8	Demolish existing croquet club and dispose debris off site	m²	178	120.00	21,360.00
11	Remove existing small shelters and dispose off site	No	14	650.00	9,100.00
44	Allowance for unforeseen demolition including disposal of debris off site	Item			8,000.00
62	No allowance for handling of asbestos	Note			Excl.
63	No allowance for handling of contaminated materials	Note			Excl.
85	No allowance for removal of large trees	Note			Excl.
	DE - Demolition and Site Clearance				**179,902.70**
EA	**Earthworks**				
87	No allowance for bulk excavations to revegetation zones (sand nourishment only)	Note			Excl.
	EA - Earthworks				**Excl.**
PV	**Pavements**				
79	Allowance for construction of new asphalt carpark to new Croquet Club (Provisional Sum)	Item			120,000.00
88	No allowance for new footpath and viewing decks - future works	Note			Excl.
	PV - Pavements				**120,000.00**
LA	**Landscaping**				
48	Allowance for soft and hard landscaping to new Croquet Club (Provisional Sum)	Item			50,000.00
86	No allowance for relocation or adjustment of existing large pine trees to suit new levels - future works	Note			Excl.
89	No allowance for new trees along Flinders Parade / Bridge Terrace - future works	Note			Excl.
	LA - Landscaping				**50,000.00**
RV	**Revegetation**				
21	Revegetation works including cultivation of existing site soils, planting tubestocks at 1 / 5m², etc.	m²	6,613	5.60	37,032.80

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COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
2 Site 2
2B Demolish Croquet Club and New Revegetation and Sand Nourishment (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
52	Allowance for ripping subgrade and providing supplementary topsoil where buildings and pavements demolished	m²	616	28.50	17,556.00
23	No allowance for mulch or irrigation system to revegetation areas	Note			Excl.
	RV - Revegetation				**54,588.80**
SN	**Sand Nourishment**				
22	Allowance for supply and placement of sand for nourishment to dunes (Provisional Sum)	Item			50,000.00
	SN - Sand Nourishment				**50,000.00**
SW	**Sea Wall**				
80	No allowance for new sea wall	Note			Excl.
	SW - Sea Wall				**Excl.**
BF	**Built Form**				
46	Allowance for construction of new Croquet Club building complete	m²	180	4,600.00	828,000.00
	BF - Built Form				**828,000.00**
SC	**Service Connections**				
33	Allowance for new electrical connection to new building	Item			60,000.00
34	Allowance for new sewer connection to new building	Item			25,000.00
35	Allowance for new water connection to new building	Item			15,000.00
38	No allowance for gas service to new building	Note			Excl.
	SC - Service Connections				**100,000.00**
SV	**Services**				
76	Allowance for lighting to Croquet Club carpark	Item			40,000.00
	SV - Services				**40,000.00**
SD	**Stormwater Drainage**				
37	Allowance for new stormwater connection to new building	Item			10,000.00
78	Allowance for stormwater infrastructure to Croquet Club carpark - assume mostly overland flow	Item			15,000.00
	SD - Stormwater Drainage				**25,000.00**
MT	**Medium Term Key Moves**				
25	No allowance for Medium Term Key Moves	Note			Excl.
	MT - Medium Term Key Moves				**Excl.**
LT	**Long Term Key Moves**				
26	No allowance for Long Term Key Moves	Note			Excl.
	LT - Long Term Key Moves				**Excl.**
CT	**Contingencies**				
29	Design Development Contingency	Item			170,000.00

COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
2 Site 2
2B Demolish Croquet Club and New Revegetation and Sand Nourishment (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
30	Construction Contingency	Item			170,000.00
	CT - Contingencies				**340,000.00**
DEMOLISH CROQUET CLUB AND NEW REVEGETATION AND SAND NOURISHMENT					**2,027,491.50**

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COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
2 Site 2
2C Protect Qahwa Heritage Cafe

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
PR	**Preliminaries**				
27	Contractors Preliminaries and Supervision	Item			235,000.00
28	Traffic and Pedestrian Management	Item			20,000.00
	PR - Preliminaries				**255,000.00**
DE	**Demolition and Site Clearance**				
1	Clear site of rubbish and debris	Item			1,500.00
2	Take up existing asphalt sports court pavement and dispose off site	m²	960	28.00	26,880.00
3	Take up existing beach volleyball courts and dispose off site	m²	2,348	10.50	24,654.00
4	Take up existing softfall mulch and dispose off site	m²	721	18.00	12,978.00
6	Demolish existing concrete skatepark and dispose off site	m²	635	100.00	63,500.00
7	Take up existing road pavement including kerbing and dispose off site	m²	769	43.00	33,067.00
45	Take up existing rock revetment and dispose off site	m²	388	65.00	25,220.00
13	Take up existing softscape and dispose off site (lawns, garden beds, etc.)	m²	6,538	18.50	120,953.00
15	Take up existing footpath pavement and dispose off site	m²	1,155	24.80	28,644.00
16	Take down existing fence and dispose off site	m	319	27.00	8,613.00
17	Demolish existing 4.5m x 6.0m toilet block and dispose debris off site	No	1	8,500.00	8,500.00
43	Isolate, disconnect and remove existing beach volleyball lights	No	6	1,500.00	9,000.00
5	Remove existing play equipment and dispose off site	Item			20,000.00
59	Allowance for removal of existing seaweed to allow for new works (Provisional Sum)	Item			15,000.00
44	Allowance for unforeseen demolition including disposal of debris off site	Item			7,500.00
	DE - Demolition and Site Clearance				**406,009.00**
EA	**Earthworks**				
92	Allowance for earthworks where existing rock revetment demolished	m²	388	75.00	29,100.00
73	No allowance for excavation in rock	Note			Excl.
74	No allowance for excavation, handling or cartage of contaminated material	Note			Excl.
	EA - Earthworks				**29,100.00**
PV	**Pavements**				
41	Allowance to construct 3.0m wide shared use asphalt footpath adjacent new sea wall including excavation, base preparation, sealing, etc.	m²	285	125.00	35,625.00
49	No allowance for new tennis courts	Note			Excl.
50	No allowance for new skate park	Note			Excl.
	PV - Pavements				**35,625.00**
LA	**Landscaping**				
90	Allowance to relocate existing large palm trees to suit new sea wall	No	4	4,500.00	18,000.00

COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

LOCATION MAIN HEADINGS ITEM
2 Site 2
2C Protect Qahwa Heritage Cafe (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
91	Allowance to adjust existing landscaping to Qahwa Cafe to suit new sea wall alignment	Item			25,000.00
86	No allowance for relocation or adjustment of existing large pine trees to suit new levels - future works	Note			Excl.
89	No allowance for new trees along Flinders Parade / Bridge Terrace - future works	Note			Excl.
	LA - Landscaping				**43,000.00**
RV	**Revegetation**				
21	Revegetation works including cultivation of existing site soils, planting tubestocks at 1 / 5m², etc.	m²	13,333	5.60	74,664.80
52	Allowance for ripping subgrade and providing supplementary topsoil where buildings and pavements demolished	m²	6,586	28.50	187,701.00
23	No allowance for mulch or irrigation system to revegetation areas	Note			Excl.
	RV - Revegetation				**262,365.80**
BV	**Beach Volleyball Court**				
53	Allowance for new beach volleyball courts integrated into sand dunes including nets, fencing, etc (Provisional Sum)	Item			75,000.00
	BV - Beach Volleyball Court				**75,000.00**
SN	**Sand Nourishment**				
22	Allowance for supply and placement of sand for nourishment to dunes (Provisional Sum)	Item			150,000.00
	SN - Sand Nourishment				**150,000.00**
SW	**Sea Wall**				
18	Construct new hybrid sea wall including excavation, supply and placement of buried rock, sand backfill and mounding, etc.	m	95	3,750.00	356,250.00
	SW - Sea Wall				**356,250.00**
BF	**Built Form**				
51	Allowance for selected upgrade work to existing Qahwa Cafe (Provisional Sum)	Item			200,000.00
	BF - Built Form				**200,000.00**
SV	**Services**				
42	No allowance for lighting to shared use path	Note			Excl.
54	No allowance for lighting to beach volleyball courts	Note			Excl.
	SV - Services				**Excl.**
MT	**Medium Term Key Moves**				
25	No allowance for Medium Term Key Moves	Note			Excl.
	MT - Medium Term Key Moves				**Excl.**

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COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
2 Site 2
2C Protect Qahwa Heritage Cafe (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
LT	**Long Term Key Moves**				
26	No allowance for Long Term Key Moves	Note			Excl.
	LT - Long Term Key Moves				**Excl.**
CT	**Contingencies**				
29	Design Development Contingency	Item			190,000.00
30	Construction Contingency	Item			190,000.00
	CT - Contingencies				**380,000.00**
PROTECT QAHWA HERITAGE CAFE					**2,192,349.80**

COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
3 Site 3

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
PR	**Preliminaries**				
27	Contractors Preliminaries and Supervision	Item			1,970,000.00
28	Traffic and Pedestrian Management	Item			100,000.00
	PR - Preliminaries				**2,070,000.00**
DE	**Demolition and Site Clearance**				
1	Clear site of rubbish and debris	Item			2,500.00
57	Demolish existing concrete terracing and dispose off site	m²	1,402	60.00	84,120.00
45	Take up existing rock revetment and dispose off site	m²	548	65.00	35,620.00
15	Take up existing footpath pavement and dispose off site	m²	1,364	24.80	33,827.20
59	Allowance for removal of existing seaweed to allow for new works (Provisional Sum)	Item			15,000.00
44	Allowance for unforeseen demolition including disposal of debris off site	Item			6,500.00
85	No allowance for removal of large trees	Note			Excl.
	DE - Demolition and Site Clearance				**177,567.20**
EA	**Earthworks**				
92	Allowance for earthworks where existing rock revetment demolished	m²	548	75.00	41,100.00
73	No allowance for excavation in rock	Note			Excl.
74	No allowance for excavation, handling or cartage of contaminated material	Note			Excl.
	EA - Earthworks				**41,100.00**
PV	**Pavements**				
41	Allowance to construct 3.0m wide shared use asphalt footpath adjacent new sea wall including excavation, base preparation, sealing, etc.	m²	2,000	125.00	250,000.00
	PV - Pavements				**250,000.00**
LA	**Landscaping**				
93	Allowance for making good to existing lawn and vegetation at completion of new sea wall works	Item			25,000.00
	LA - Landscaping				**25,000.00**
RV	**Revegetation**				
72	No allowance for revegetation works	Note			Excl.
	RV - Revegetation				**Excl.**
SW	**Sea Wall**				
20	Earthworks to create levels for new concrete terraced sea wall 1.5m above existing levels	m	326	275.00	89,650.00
19	Construct concrete terraced sea wall including preparation works, base course, reinforcement, plain grey concrete, joints, etc.	m	326	7,000.00	2,282,000.00
55	Upgrade existing rock revetment to concrete terraced sea wall including existing rock removal / adjustments, earthworks, base course, reinforcement, plain grey concrete, joints, etc.	m	341	7,250.00	2,472,250.00

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COASTAL ADAPTION MASTER PLAN
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RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
3 Site 3 (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
58	Construct concrete amphitheatre including preparation works, base course, reinforcement, plain grey concrete, joints, etc	m²	2,946	2,500.00	7,365,000.00
	SW - Sea Wall				**12,208,900.00**
BR	**Boat Ramp**				
60	Allowance to reconstruct existing boat ramp to suit new levels (Provisional Sum)	Item			175,000.00
96	No allowance for adjustments to existing causeway	Note			Excl.
	BR - Boat Ramp				**175,000.00**
BF	**Built Form**				
95	No allowance for alterations to existing lawn bowls club	Note			Excl.
	BF - Built Form				**Excl.**
SV	**Services**				
94	Allowance for lighting to new shared use path	No	27	8,500.00	229,500.00
	SV - Services				**229,500.00**
MT	**Medium Term Key Moves**				
25	No allowance for Medium Term Key Moves	Note			Excl.
	MT - Medium Term Key Moves				**Excl.**
LT	**Long Term Key Moves**				
26	No allowance for Long Term Key Moves	Note			Excl.
	LT - Long Term Key Moves				**Excl.**
CT	**Contingencies**				
29	Design Development Contingency	Item			1,520,000.00
30	Construction Contingency	Item			1,520,000.00
	CT - Contingencies				**3,040,000.00**
SITE 3					**18,217,067.20**

COASTAL ADAPTION MASTER PLAN
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RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
4 Site 4

4A Remove and Re-establish Carpark

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
PR	**Preliminaries**				
27	Contractors Preliminaries and Supervision	Item			1,125,000.00
28	Traffic and Pedestrian Management	Item			100,000.00
	PR - Preliminaries				**1,225,000.00**
DE	**Demolition and Site Clearance**				
1	Clear site of rubbish and debris	Item			1,500.00
7	Take up existing road pavement including kerbing and dispose off site	m²	4,853	43.00	208,679.00
15	Take up existing footpath pavement and dispose off site	m²	504	24.80	12,499.20
97	Isolate, disconnect and remove existing light	No	2	1,500.00	3,000.00
98	Allowance to remove existing artwork	Item			5,000.00
44	Allowance for unforeseen demolition including disposal of debris off site	Item			3,500.00
85	No allowance for removal of large trees	Note			Excl.
	DE - Demolition and Site Clearance				**234,178.20**
EA	**Earthworks**				
73	No allowance for excavation in rock	Note			Excl.
74	No allowance for excavation, handling or cartage of contaminated material	Note			Excl.
	EA - Earthworks				**Excl.**
SW	**Sea Wall**				
80	No allowance for new sea wall	Note			Excl.
	SW - Sea Wall				**Excl.**
BF	**Built Form**				
61	Construct new multi-deck 180 car carpark complete at new location - location to be confirmed (Provisional Sum)	Item			7,000,000.00
99	No allowance to purchase land for new multi-deck carpark	Note			Excl.
	BF - Built Form				**7,000,000.00**
SC	**Service Connections**				
33	Allowance for new electrical connection to new building	Item			180,000.00
35	Allowance for new water connection to new building	Item			30,000.00
	SC - Service Connections				**210,000.00**
SD	**Stormwater Drainage**				
37	Allowance for new stormwater connection to new building	Item			25,000.00
	SD - Stormwater Drainage				**25,000.00**
MT	**Medium Term Key Moves**				
25	No allowance for Medium Term Key Moves	Note			Excl.
	MT - Medium Term Key Moves				**Excl.**

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COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
4 Site 4
4A Remove and Re-establish Carpark (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
LT	**Long Term Key Moves**				
26	No allowance for Long Term Key Moves	Note			Excl.
	LT - Long Term Key Moves				**Excl.**
MA	**Builders Margin**				
81	Allowance for Builders Margin and Overheads	Item			298,768.00
	MA - Builders Margin				**298,768.00**
CT	**Contingencies**				
29	Design Development Contingency	Item			870,000.00
30	Construction Contingency	Item			870,000.00
	CT - Contingencies				**1,740,000.00**
REMOVE AND RE-ESTABLISH CARPARK					**10,732,946.20**

COASTAL ADAPTION MASTER PLAN
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RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
4 Site 4
4B Replace Carpark with Dunes including Revegetation and Sand Nourishment

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
PR	**Preliminaries**				
27	Contractors Preliminaries and Supervision	Item			105,000.00
28	Traffic and Pedestrian Management	Item			16,500.00
	PR - Preliminaries				**121,500.00**
DE	**Demolition and Site Clearance**				
1	Clear site of rubbish and debris	Item			1,000.00
65	Locate, excavate and remove existing buried concrete blocks and dispose off site	m	56	400.00	22,400.00
44	Allowance for unforeseen demolition including disposal of debris off site	Item			1,500.00
82	No allowance for removal of existing softscape / dune vegetation - assume revegetation is supplementary to existing only	Note			Excl.
85	No allowance for removal of large trees	Note			Excl.
	DE - Demolition and Site Clearance				**24,900.00**
EA	**Earthworks**				
101	Allowance for earthworks to create levels for natural dunes	Item			75,000.00
73	No allowance for excavation in rock	Note			Excl.
74	No allowance for excavation, handling or cartage of contaminated material	Note			Excl.
	EA - Earthworks				**75,000.00**
PV	**Pavements**				
64	Allowance to construct 3.0m wide shared use asphalt footpath including excavation, base preparation, sealing, etc.	m²	901	125.00	112,625.00
83	No allowance for shared use path to full extent of Site 4 - allow to connect Cafe / Mini-Golf building to existing shared use path	Note			Excl.
	PV - Pavements				**112,625.00**
RV	**Revegetation**				
21	Revegetation works including cultivation of existing site soils, planting tubestocks at 1 / 5m², etc.	m²	14,443	5.60	80,880.80
52	Allowance for ripping subgrade and providing supplementary topsoil where buildings and pavements demolished	m²	5,357	28.50	152,674.50
23	No allowance for mulch or irrigation system to revegetation areas	Note			Excl.
100	No allowance for revegetation works West of demolished carpark	Note			Excl.
	RV - Revegetation				**233,555.30**
SN	**Sand Nourishment**				
22	Allowance for supply and placement of sand for nourishment to dunes (Provisional Sum)	Item			150,000.00
	SN - Sand Nourishment				**150,000.00**

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COASTAL ADAPTION MASTER PLAN
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RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
4 Site 4
4B Replace Carpark with Dunes including Revegetation and Sand Nourishment (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
SW	**Sea Wall**				
80	No allowance for new sea wall	Note			Excl.
	SW - Sea Wall				**Excl.**
SV	**Services**				
94	Allowance for lighting to new shared use path	No	12	8,500.00	102,000.00
	SV - Services				**102,000.00**
MT	**Medium Term Key Moves**				
25	No allowance for Medium Term Key Moves	Note			Excl.
	MT - Medium Term Key Moves				**Excl.**
LT	**Long Term Key Moves**				
26	No allowance for Long Term Key Moves	Note			Excl.
	LT - Long Term Key Moves				**Excl.**
CT	**Contingencies**				
29	Design Development Contingency	Item			90,000.00
30	Construction Contingency	Item			90,000.00
	CT - Contingencies				**180,000.00**
REPLACE CARPARK WITH DUNES INCLUDING REVEGETATION AND SAND NOURISHMENT					**999,580.30**

COASTAL ADAPTION MASTER PLAN
ORDER OF COST ESTIMATE | SHORT TERM MOVES

RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
5 Site 5
5A Improvements to Estuary

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
PR	**Preliminaries**				
27	Contractors Preliminaries and Supervision	Item			105,000.00
28	Traffic and Pedestrian Management	Item			7,500.00
	PR - Preliminaries				**112,500.00**
DE	**Demolition and Site Clearance**				
1	Clear site of rubbish and debris	Item			1,000.00
13	Take up existing softscape and dispose off site (lawns, garden beds, etc.)	m²	4,867	18.50	90,039.50
15	Take up existing footpath pavement and dispose off site	m²	667	24.80	16,541.60
71	Allowance for alteration to existing caravan park fencing to suit new alignment	Item			30,000.00
44	Allowance for unforeseen demolition including disposal of debris off site	Item			2,500.00
	DE - Demolition and Site Clearance				**140,081.10**
EA	**Earthworks**				
73	No allowance for excavation in rock	Note			Excl.
74	No allowance for excavation, handling or cartage of contaminated material	Note			Excl.
	EA - Earthworks				**Excl.**
PV	**Pavements**				
69	Allowance to construct informal rubble pathway including excavation, proof rolling, rubble wearing course, etc.	m²	569	55.00	31,295.00
	PV - Pavements				**31,295.00**
RV	**Revegetation**				
21	Revegetation works including cultivation of existing site soils, planting tubestocks at 1 / 5m², etc.	m²	28,488	5.60	159,532.80
52	Allowance for ripping subgrade and providing supplementary topsoil where buildings and pavements demolished	m²	667	28.50	19,009.50
23	No allowance for mulch or irrigation system to revegetation areas	Note			Excl.
	RV - Revegetation				**178,542.30**
WL	**Wetland**				
70	Allowance for conversion of existing levee into new wetland including associated earthworks, planting, etc.	m²	2,465	140.00	345,100.00
	WL - Wetland				**345,100.00**
SW	**Sea Wall**				
80	No allowance for new sea wall	Note			Excl.
	SW - Sea Wall				**Excl.**

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COASTAL ADAPTION MASTER PLAN
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RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
5 Site 5
5A Improvements to Estuary (continued)

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
MT	**Medium Term Key Moves**				
25	No allowance for Medium Term Key Moves	Note			Excl.
	MT - Medium Term Key Moves				**Excl.**
LT	**Long Term Key Moves**				
26	No allowance for Long Term Key Moves	Note			Excl.
	LT - Long Term Key Moves				**Excl.**
CT	**Contingencies**				
29	Design Development Contingency	Item			90,000.00
30	Construction Contingency	Item			90,000.00
	CT - Contingencies				**180,000.00**
IMPROVEMENTS TO ESTUARY					**987,518.40**

COASTAL ADAPTION MASTER PLAN
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RLB Rider Levett Bucknall

LOCATION MAIN HEADINGS ITEM
5 Site 5
5B New Boardwalk with Trail and Viewing Deck

Rates Current At April 2026

Ref	Description	Unit	Qty	Rate $	Total Cost $
PR	**Preliminaries**				
27	Contractors Preliminaries and Supervision	Item			1,235,000.00
28	Traffic and Pedestrian Management	Item			75,000.00
	PR - Preliminaries				**1,310,000.00**
DE	**Demolition and Site Clearance**				
1	Clear site of rubbish and debris	Item			1,500.00
13	Take up existing softscape and dispose off site (lawns, garden beds, etc.)	m²	2,850	18.50	52,725.00
44	Allowance for unforeseen demolition including disposal of debris off site	Item			1,500.00
82	No allowance for removal of existing softscape / dune vegetation - assume revegetation is supplementary to existing only	Note			Excl.
	DE - Demolition and Site Clearance				**55,725.00**
EA	**Earthworks**				
73	No allowance for excavation in rock	Note			Excl.
74	No allowance for excavation, handling or cartage of contaminated material	Note			Excl.
	EA - Earthworks				**Excl.**
SW	**Sea Wall**				
80	No allowance for new sea wall	Note			Excl.
	SW - Sea Wall				**Excl.**
BW	**Boardwalk and Viewing Platforms**				
67	Construct timber or similar boardwalk including substructure, decking, balustrade, etc.	m²	1,650	2,950.00	4,867,500.00
68	Construct timber or similar viewing platform including substructure, decking, balustrade, etc.	m²	1,200	2,750.00	3,300,000.00
	BW - Boardwalk and Viewing Platforms				**8,167,500.00**
MT	**Medium Term Key Moves**				
25	No allowance for Medium Term Key Moves	Note			Excl.
	MT - Medium Term Key Moves				**Excl.**
LT	**Long Term Key Moves**				
26	No allowance for Long Term Key Moves	Note			Excl.
	LT - Long Term Key Moves				**Excl.**
CT	**Contingencies**				
29	Design Development Contingency	Item			960,000.00
30	Construction Contingency	Item			960,000.00
	CT - Contingencies				**1,920,000.00**
NEW BOARDWALK WITH TRAIL AND VIEWING DECK					**11,453,225.00**

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