Interim
Siting and design guidelines

for structures on Victorian Coast

July 2019

VICTORIA State Government | Environment, Land, Water and Planning

Photo credit

Seaford Life Saving Club, Seaford
Architect: Robert Simeoni Architects, Photo: John Gollings

Aboriginal acknowledgment

The State Government proudly acknowledges the Traditional Owners of the Victorian marine and coastal environment as the traditional custodians of the land. We pay our respects to their ancestors and elders, past and present. We recognise and respect their unique cultural heritage, beliefs and relationship to their traditional lands, which continue to be important to them today. We recognise the intrinsic connection of Traditional Owners to their country and value the contribution their Caring for Country makes to the management of the land, its coastlines, its seas and its waterways. We support the need for genuine and lasting partnerships with Traditional Owners to understand their culture and connections to country in the way we plan for and manage the coast. We embrace the spirit of reconciliation, working towards equity of outcomes and ensuring an equal voice for Australia's first people.

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FOREWORD

Coastal projects form part of our experience of the coast and need to be carefully designed to enhance that experience and make a positive contribution to the environment. Every new project is a chance to contribute to our coastal cultural identity.

The Siting and Design Guidelines for Structures on the Victorian Coast aim to inspire a creative and innovative approach to development in the marine and coastal environment that is considerate of the natural and cultural values in response to climate change challenges and population growth.

Victorians can lead the way in siting and design by ensuring best practice is applied to all development on our coast.

CONTENTS

INTRODUCTION

The coastline is one of Victoria's greatest natural assets. This fragile, dynamic and changeable environment is in high demand for a large range of uses.

The management challenge for such a popular yet vulnerable landscape is to adopt policies that will encourage compatible development that enables protection and enhances its natural qualities. These challenges mean we need to be smart in how we plan, design, build and manage structures on the coast.

This document provides a clear set of guidelines that consider siting and design challenges in response to pressures of population growth and climate change. It identifies successful practices to reduce the vulnerability of the coastline while managing coastal land and infrastructure, maintaining public access and enhancing visitor experience.

When we place structures in this environment, it has often been with the expectation that the coast will not move or the structure will be resistant to impact. As a consequence buildings and infrastructure are often damaged or compromised following storm events or erosion. Ideally, we want to avoid locating structures in the dynamic coastal zone, which includes sand dunes, beaches, cliffs and low-lying areas.

These Guidelines have been formulated to assist in achieving better quality outcomes in the coastal environment that respect its fragility and recognises its natural and cultural values.

It is essential that the Guidelines are considered in conjunction with the Victorian Marine and Coastal Policy, which provides the policy directions for use and development in the marine and coastal environment.

ABOUT THE GUIDELINES

The Marine and Coastal Policy provides the principles for use and development on the coast. The Guidelines provide further details, examples of excellence and inspiration for how the policies apply.

The Guidelines apply to all development on Victoria's coast, whether on public or private land. They provide a set of fundamental considerations that underpin best practice for future use and development of structures and facilities on the coast.

The Guidelines are a tool to enable constructive conversations between proponents, the community and relevant authorities and land managers at an early stage in project planning to ensure that the expectations and constraints of building in a coastal environment is understood.

The Guidelines are not intended to duplicate information, standards or planning requirements detailed elsewhere. Given this, it is essential that all other relevant legislation, policies, strategies and plans are considered when planning to use or develop on the coast.

WHERE THE GUIDELINES APPLY

The Guidelines apply to the planning and management of matters relating to, and affecting, the marine and coastal environment.

As defined in the *Marine and Coastal Act 2018*, the marine and coastal environment includes all private and public land and waters between the outer limit of Victorian coastal water and five kilometres inland of the high-water mark of the sea, including:

a) The land (whether or not covered by water) to a depth of 200 metres below the surface of that land.

b) Any water covering the land referred to in paragraph (a) above from time to time.

c) The biodiversity associated with the land and water referred to in paragraphs a) and b).

References to 'the coast' includes coastal, estuarine and marine environments on public and private land.

The Guidelines also provide direction for coastal development proposals on private land, by informing the application of policies set out in the State Planning Policy Framework and Local Planning Policy Frameworks.

USERS

These Guidelines are to be used as the principle siting and design tool for individuals and groups who are developing proposals for structures on the coast. This includes groups or organisations such as:

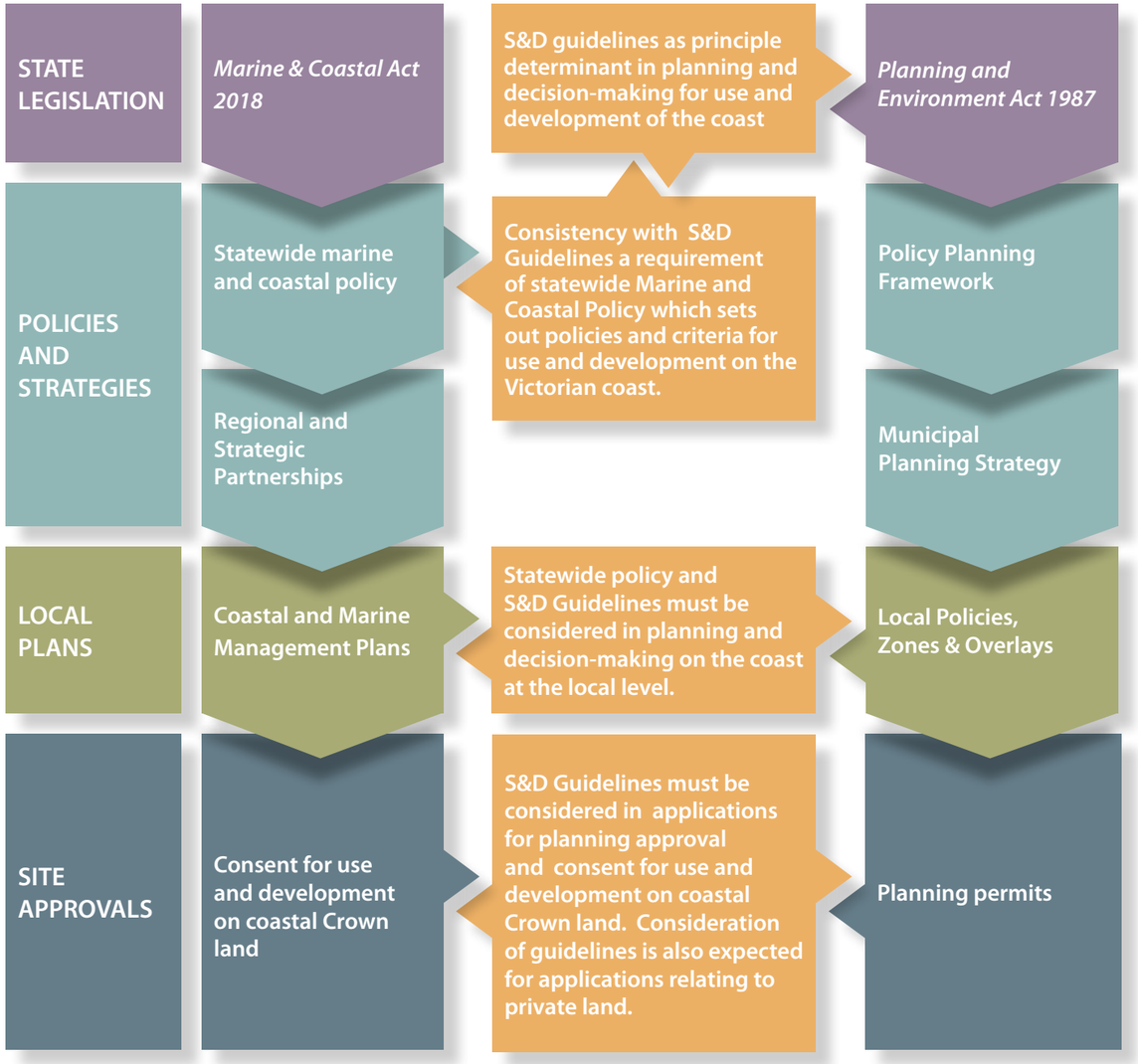
- land managers
- local councils
- land use planners
- committees of management
- community groups (life saving clubs, yacht clubs)
- design consultants
- architects
- developers
- private land holders.

They are also to be used as an assessment tool for individuals and groups involved in assessment and approvals processes for development proposals on the coast, such as:

- state government department planners and managers
- local government planners and managers
- public authorities and agencies
- coastal volunteer committees of management
- Representative Aboriginal Parties.

POLICY & PLANNING FRAMEWORK

POLICY & PLANNING FRAMEWORK DIAGRAM



The *Marine and Coastal Act 2018* sets out the framework for marine and coastal planning and management in Victoria.

The Act requires a Policy to set out policies for planning and managing the marine and coastal environment, and to provide guidance to decision makers in achieving the Act's objectives.

The policy and planning framework is a four-tiered system with state, regional, local and site policies, plans and approvals. The framework closely aligns with the overall Victorian land planning system defined through the *Planning and Environment Act 1987*.

The Marine and Coastal Act 2018

The *Marine and Coastal Act 2018* sets out the legislative arrangements and framework for protecting and managing Victoria's marine and coastal environment. It includes objectives and guiding principles for the planning and management of the marine and coastal environment. The principles include:

- Integrated coastal zone management
- Ecosystem-based management
- Ecologically sustainable management
- Evidence-based decision-making
- Precautionary principle
- Proportionate and risk-based principle
- Adaptive management

These principles must be applied when planning for use or development of the marine and coastal environment.

The Statewide Marine and Coastal Policy (State)

The Marine and Coastal Policy guides decision makers in the planning, management and sustainable use of our coast and marine environment. It provides direction to decision makers including local councils and land managers on a range of issues such as dealing with the impacts of climate change, population growth and ageing coastal structures.

Regional and Strategic Partnership Products (Regional)

Regional and Strategic Partnerships (RASPs) are established to respond to an identified regional issue relating to or affecting the marine and coastal environment and/or prepare a product.

Coastal and Marine Management Plans (Local)

Coastal and Marine Management Plans are planning tools for local land managers and communities to implement the policy at a local level and direct future planning and management of coastal Crown land.

Approval (Site)

In Victoria, proposals for the use and development of coastal Crown land are considered under the legislative framework of the *Marine and Coastal Act 2018* and the *Planning and Environment Act 1987*.

Coastal consent

Under provisions of the *Marine and Coastal Act 2018*, all use and development on coastal Crown land requires consent of the Minister, or a delegate, through application to the Department of Environment, Land, Water and Planning (DELWP). A planning permit may also be required for the use or development on coastal Crown land. In this situation, the consent process is linked to the planning permit process through a referral under the *Planning and Environment Act 1987*.

Planning permit

Planning schemes are the primary tool for determining how land can be used and developed across a municipality. The relevant municipal planning scheme will determine if a planning permit is required. All planning permit applications are lodged with the local council, which may refer the application to an outside body such as DELWP.

In coastal areas, the local planning scheme may extend into the marine environment. In Port Phillip Bay, some municipal planning schemes extend 600 metres into the water.

Under section 61(3) of the *Planning and Environment Act 1987*, the local government planning authority cannot issue a planning permit on marine and coastal Crown land unless consent (under the Marine and Coastal Act 2018) has been issued. If the Minister (or delegate) refuses to issue coastal consent, the planning authority must also refuse to issue a planning permit.

Where a planning permit is not necessary, a coastal consent is still required.

FIRST PRINCIPLES

PURPOSE AND NEED

Coastal Crown land reserves and foreshores provide important public space. They are owned by, and accessible to, all Victorians. However, this land is limited and may be further reduced as sea levels rise and the coastline retreats.

High demand for use and development of a limited and precious resource dictates that only structures that functionally need to be near water or that significantly contribute to social values, such as public enjoyment and appreciation of the coast, should be on coastal Crown land. The following table gives a sense of what types of structures are appropriate:

Usually located on coastal Crown land because of direct support of coastal activities	• Jetty • Pier • Marina • Mooring • Boat ramp • Harbour • Navigation aids • Life saving observation tower
Not necessary to be on coastal Crown land but provide some support to the functioning of coastal activities and therefore may be appropriate	• Toilet facilities • Shared trails, boardwalks and stairs • Car parking • Equipment storage facilities • Marine rescue facility • Lifesaving club rooms • Multi-functional facilities • Public lookouts • Barbecue, picnic and play equipment • Kiosk/café/restaurant (in an urban setting)
Coastal Crown land location not necessary and no provision of support to coastal activity, to be removed/relocated as the opportunity arises	• Non-water-based sporting facilities • Non-maritime industrial plant and storage • Private infrastructure (e.g. jetties, beach access paths, bathing boxes, fishing huts) • Community hall • Commercial function centre • Memorial plaques

In some instances, a town may have limited or unsuitable public land for use and development other than coastal Crown land. This is not sufficient reason on its own to use coastal Crown land for developments that do not depend on the coast. Alternative options, including removal and relocation, should be considered when redevelopment opportunities arise.

The proposal should also be considered in terms of its 'purpose and need'. For example, a life saving club redevelopment may include a lookout tower, toilet and change facilities, boat storage, gymnasium, restaurant and accommodation. However, only some of these elements need to be located at the site (such as the lookout tower). Other elements may support these coastal-dependent uses (e.g. boat storage and ancillary services) and may also be deemed suitable to be on the site. However, some elements (e.g. accommodation and gymnasium) do not fit the criteria of being dependent on the coast and are therefore not suitable.

Only the elements of the proposed structure that need to be located on coastal Crown land should be included in the design.

CLIMATE CHANGE AND ADAPTATION

One of the biggest impacts on the marine and coastal environment from climate change is sea level rise. Permanent and periodic inundation, and accelerated erosion rates will transform and degrade Victoria's coastline.

New public facilities and structures, including access paths, roads, drainage systems and planning for new private development, must take into account increased coastal hazards.

When replacing or upgrading existing infrastructure and public facilities, the first step is to consider if the structure is still required and if the site is still suitable. Proponents need to demonstrate that alternative locations and opportunities have been considered before proceeding with plans to upgrade or rebuild, including adaptation responses such as avoid, remove, retreat or relocate.

If a protective structure (eg. seawall, revetments, breakwaters and groynes) is required to support maintaining a facility in its current location or if a new development requires a protective structure, then the location is possibly unsuitable. The aim is to avoid the need for protective structures to support developments in the marine and coastal environment.

Climate change also elevates other risks on the coast, including bushfire. This poses other challenges of competing requirements where the need to maintain environmental values is in conflict with the requirements to achieve a safe and suitable built structure. State and local governments can provide specific information on requirements for managing bushfire risk.

The Guidelines encourage an innovative, agile and flexible approach to siting and design that responds to changing coastal conditions, reduces risk and achieves coastal resilience.

At this point in the planning process, it is essential to discuss proposals with land managers and relevant authorities before proceeding. Studies, such as coastal hazard assessments or coastal processes and geomorphology studies, may be required to determine if a structure is sustainable in the identified location.

At this primary stage of planning, the following questions may help proponents define the project objectives and set the parameters for further analysis:

- What is the primary purpose of the structure?
- What is the expected life span of the new structure?
- Will climate predictions (sea level rise, greater storm surge) affect the structure before its expected life cycle is met?
- Does cost of building and maintenance outweigh the benefits?

FOOTPRINT

New structures should aim to minimise their physical footprint, including their height. If the proposed structure is replacing or modifying an existing structure, the aim is to keep the design within the existing footprint. The height and scale of any structure should be designed to be appropriate to its context as outlined in the following fundamentals. This will relate back to 'purpose and need' in terms of what is essential as part of the redevelopment and what may not be possible if it makes the footprint considerably larger.

SUMMARY

- **Only structures or parts of structures that meet the requirements of being appropriate for coastal Crown land should be included in the design.**
- **Options to avoid (for new structures), remove, retreat or relocate (for existing structures being updated/ additional works) must be satisfied before proceeding.**
- **Most elements of the redesign of existing structures should be located within the existing structural footprint.**
- **The design of new structures should minimise the physical footprint (area and height).**
- **All new and renewing structures are subject to the principles and fundamentals outlined in these Guidelines.**

SITING AND DESIGN FUNDA-MENTALS

Good design is informed by its location and responds to site-specific environmental, social and cultural conditions. Every site has a unique nature and it is important to understand the surrounding environment and character through a thorough site analysis.

These Guidelines are structured around 15 fundamentals that guide the design of every structure. Properly examining and addressing each fundamental forms the foundation for excellence in siting and design that is sympathetic to the coastal and marine landscape, and helps improve the natural environment and coastal character.

THE 15 FUNDAMENTAL ELEMENTS TO BE CONSIDERED ARE:

1. ABORIGINAL CULTURAL HERITAGE
2. COASTAL PROCESSES
3. GEOLOGY
4. MORPHOLOGY
5. HYDROLOGY
6. VEGETATION AND ECOLOGY
7. CLIMATIC CONDITIONS
8. VIEWS
9. PUBLIC OPEN SPACE
10. LOCAL CHARACTER AND SENSE OF PLACE
11. HERITAGE
12. PUBLIC ACCESS
13. INCREASED FUNCTION AND ADAPTABILITY
14. SUSTAINABILITY
15. MATERIALS AND FINISHES

PRIORITISING THE FUNDAMENTAL ELEMENTS

To achieve design excellence, all 15 fundamentals need to be carefully considered in the context of the site and its surrounds. However, due to the physical and local context, it can be challenging for all the fundamentals to be given the same weighting in the development or approval stage.

Table 1 will help prioritise the fundamentals. This prioritisation is based on the policy that a healthy, dynamic and biodiverse marine and coastal environment supports and maintains the important environmental, social, cultural and economic values.

TABLE 1: PRIORITISING THE FUNDAMENTALS

STEP	CONSIDERATION	FUNDAMENTAL
1	Is there a demonstrated need for the proposed structure (including all or any of its elements) to be on prime coastal land?	First principles – need, purpose, climate change and adaptation, physical footprint.
	Do not proceed if the first principles cannot be met (in line with the Marine and Coastal Policy)	
2	Does the proposal ensure the protection of the environment? Does the siting of the proposed development identify and avoid locations of coastal vulnerability and hazard?	1. Aboriginal cultural heritage 2. Coastal processes 3. Geology 4. Morphology (form and line) 5. Hydrology 6. Vegetation and ecology 7. Climatic conditions
3	Is the proposal sympathetic to the local coastal character and sense of place? Does the proposed development provide positive public benefit, access and/or amenity?	8. Views 9. Public open space 10. Local character and sense of place 11. Heritage 12. Public access
4	Does the proposed development ensure more efficient use of the site and contribute positively to the environment for the future?	13. Increased function and adaptability 14. Sustainability 15. Materials and finishes

SITE ANALYSIS AND FUNDAMENTALS

TABLE 2: SUMMARY OF THE 15 FUNDAMENTAL ELEMENTS FOR SITE ANALYSIS AND SITING AND DESIGN CONSIDERATION FOR EACH PROPOSAL

FUNDAMENTAL		SITE ANALYSIS	SITING AND DESIGN CONSIDERATIONS
1	ABORIGINAL CULTURAL HERITAGE	Engage early with Registered Aboriginal Parties and Traditional Owners on cultural heritage values relevant to place.	Can the development help protect and acknowledge tangible and intangible cultural heritage values? Does the structure have a negative impact on Aboriginal cultural heritage places and values?
2	COASTAL PROCESSES	Identify the coastal processes of the site and in the surrounding coastal compartment cell. Identify any nearby coastal hazards, low-lying areas, or areas subject to flooding, erosion or landslip.	Does the structure avoid areas subject to coastal hazards? Does the structure interfere with or impede natural coastal processes? If the structure is for protection, does it avoid detrimental impacts on coastal processes? What are the alternatives to replacing the current structure? Can a compromise be achieved (e.g. temporary, seasonal or relocatable structure)?
3	GEOLOGY	Identify the geology of the site and surrounding area.	Does the proposed construction respond sensitively to the underlying geology? Does the design of the structure respond to the local geological character?
4	MORPHOLOGY (FORM AND LINE)	Identify the dominant line of landform and vegetation, on and adjacent to the site and surrounding area. Identify the built form characteristics of nearby structures that contribute to the character of the local landscape.	Is the form and line of the proposed structure sympathetic to the surrounding landscape and context? Is the structure appropriate in scale, relative to the line of the landscape? Does the structure contribute to a new form of coastal character where specific local character is undefined?
5	HYDROLOGY	Identify all water sources and water movement patterns on site and in the surrounding area. Identify extent of seasonally wet areas.	Does the structure respond to and accommodate natural drainage patterns? Do the site and the proposed structure manage its water locally and without impact? Does the proposal retain and re-use water on site? Does the structure protect and respond to seasonally wet areas?
6	VEGETATION AND ECOLOGY	Identify the main vegetation communities on site and in the surrounding area. Identify the fauna on site and in the surrounding area.	Has existing native vegetation been retained and protected? Does the structure accommodate natural regeneration/planting of indigenous species? Does the structure accommodate faunal paths and habitats?
7	CLIMATIC CONDITIONS	Identify the climate conditions for each season, year round.	Has the structure been sited and designed to maximise sun, wind and weather protection? Does the structure provide external places of refuge and occupation protected from wind and sun?

FUNDAMENTAL		SITE ANALYSIS	SITE AND DESIGN CONSIDERATIONS
8	VIEWS	Identify the need for open space and signage/furniture.	Does the development contribute to an uncluttered, clear and usable environment?
9	PUBLIC OPEN SPACE	Identify the need for open space and signage/furniture.	Does the development contribute to an uncluttered, clear and usable environment?
10	LOCAL CHARACTER AND SENSE OF PLACE	Identify the local coastal character of the surrounding buildings and township.	Does the structure blend with and complement the local coastal character?
11	HERITAGE	Identify the local heritage and cultural narratives of the site and area. Identify the heritage significance of existing structures and potential for adaptive re-use.	Does the siting and design of the structure respect and accommodate archaeological features of the area? Can the structure re-use and integrate existing heritage features into its construction? Does the structure respond to any significant historic character of the area?
12	PUBLIC ACCESS	Identify the main public access paths and connections to and from the coast and around the site.	Does the structure enhance public access to the coast and minimise loss of open space? Does the structure provide adequate connections to and from the site? Does the structure impede public access to the coast? Does the structure provide adequate access?
13	INCREASED FUNCTION AND ADAPTABILITY	Identify opportunities to combine the uses of buildings and structures of the site and structures surrounding the site.	Does the structure make efficient use of the site and demonstrate multiple use? Can the structure be adapted for future change?
14	SUSTAINABILITY	Identify opportunities for sustainable outcomes on site for water, energy and materials.	Is the structure producing environmentally positive energy and water outcomes? Does the siting and design of the structure optimise energy considerations like thermal performance, cross ventilation, and solar orientation and insulation? Are the building materials from a sustainable source and demonstrating resilience in the coastal environment?
15	MATERIALITY PALETTE	Identify the materials, colours and textures in the surrounding natural and built environments.	Are the materials, colours and textures representative of the coastal environment and setting? Are the materials durable in the coastal environment? Are the materials sustainable?

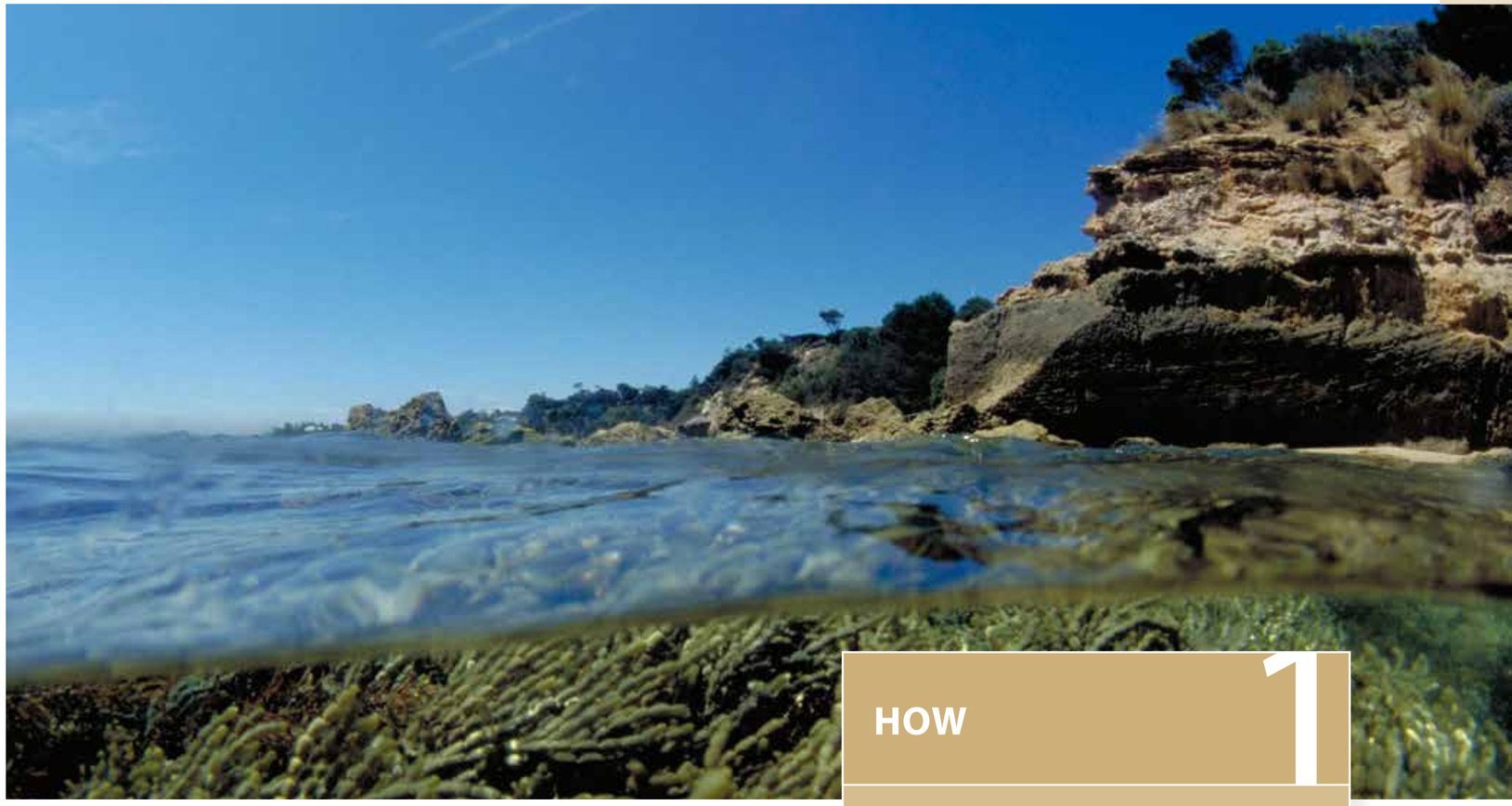
ABORIGINAL CULTURAL HERITAGE

WHAT

Traditional Owners have an inherent connection to country with a custodial role in protecting Victoria's coast and marine environment. Aboriginal heritage and cultural values play an important role in creating a sense of place and telling Victoria's unique stories.

WHY

Appropriate management of sites and values is required to ensure Traditional Owners' voices are heard and respected throughout planning and decision-making processes. Any development and structure must understand Traditional Owners' ongoing and enduring connection to the local coastal and marine environment and consider how the siting and design can reflect and respect this.



(Photo: Parks Victoria)

HOW

- **Engage early with Registered Aboriginal Parties (RAPs) and/or Traditional Owners on tangible and intangible cultural heritage values relevant to place.**
- **Acknowledge and protect Aboriginal heritage places and values in a culturally appropriate manner.**

FUNDAMENTAL ELEMENT 1

COASTAL PROCESSES

WHAT

The coast is not static; it moves and changes with the influence of tides, waves and weather systems. Interactions between coastal processes and different landforms like sandy beaches, rocky headlands and mudflats create complex and dynamic systems.

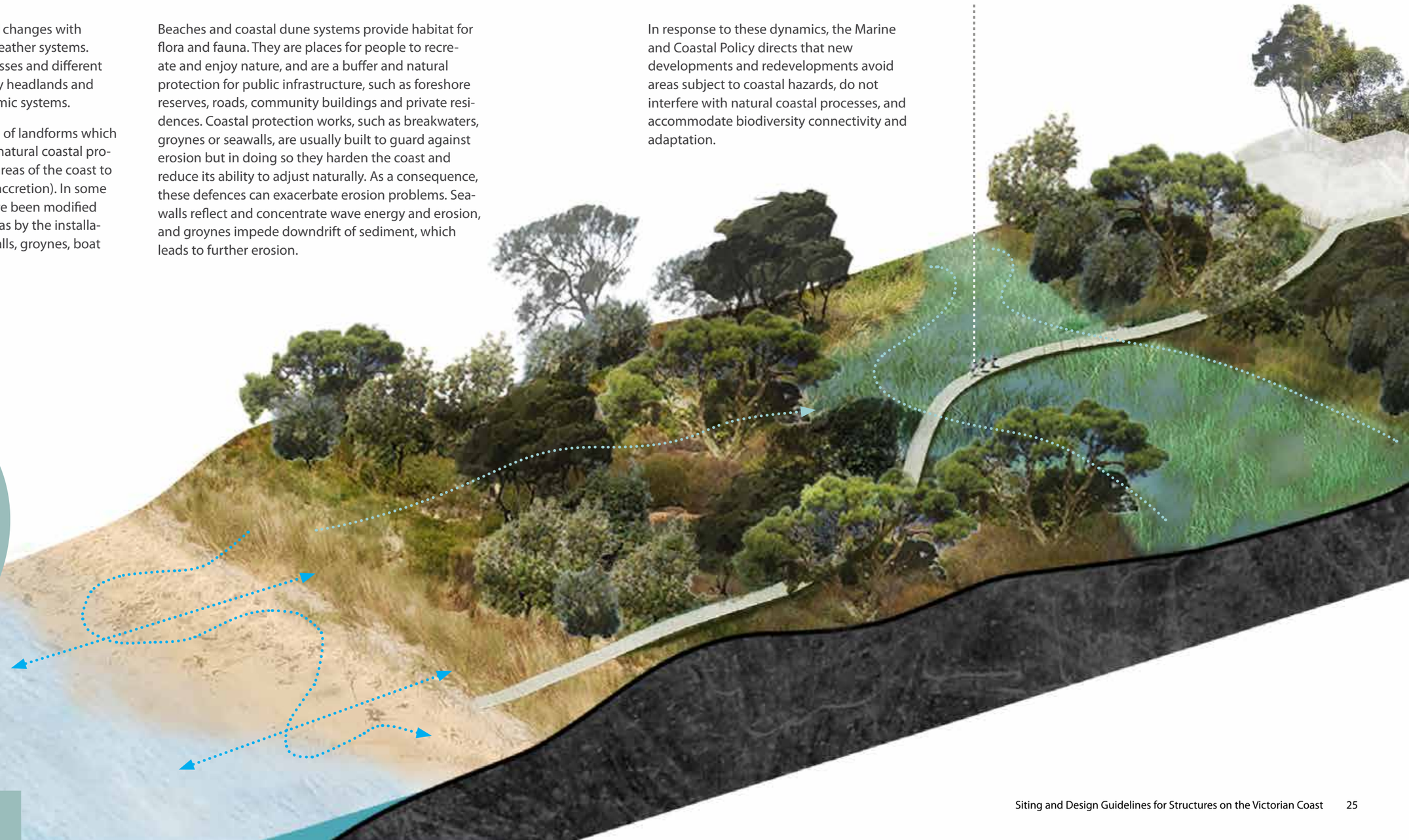
The Victorian coast exhibits a range of landforms which continue to change in response to natural coastal processes. These processes can cause areas of the coast to both be lost (erosion) and gained (accretion). In some areas, natural coastal processes have been modified through human intervention, such as by the installation of coastal infrastructure (seawalls, groynes, boat ramps, etc).

WHY

Beaches and coastal dune systems provide habitat for flora and fauna. They are places for people to recreate and enjoy nature, and are a buffer and natural protection for public infrastructure, such as foreshore reserves, roads, community buildings and private residences. Coastal protection works, such as breakwaters, groynes or seawalls, are usually built to guard against erosion but in doing so they harden the coast and reduce its ability to adjust naturally. As a consequence, these defences can exacerbate erosion problems. Seawalls reflect and concentrate wave energy and erosion, and groynes impede downdrift of sediment, which leads to further erosion.

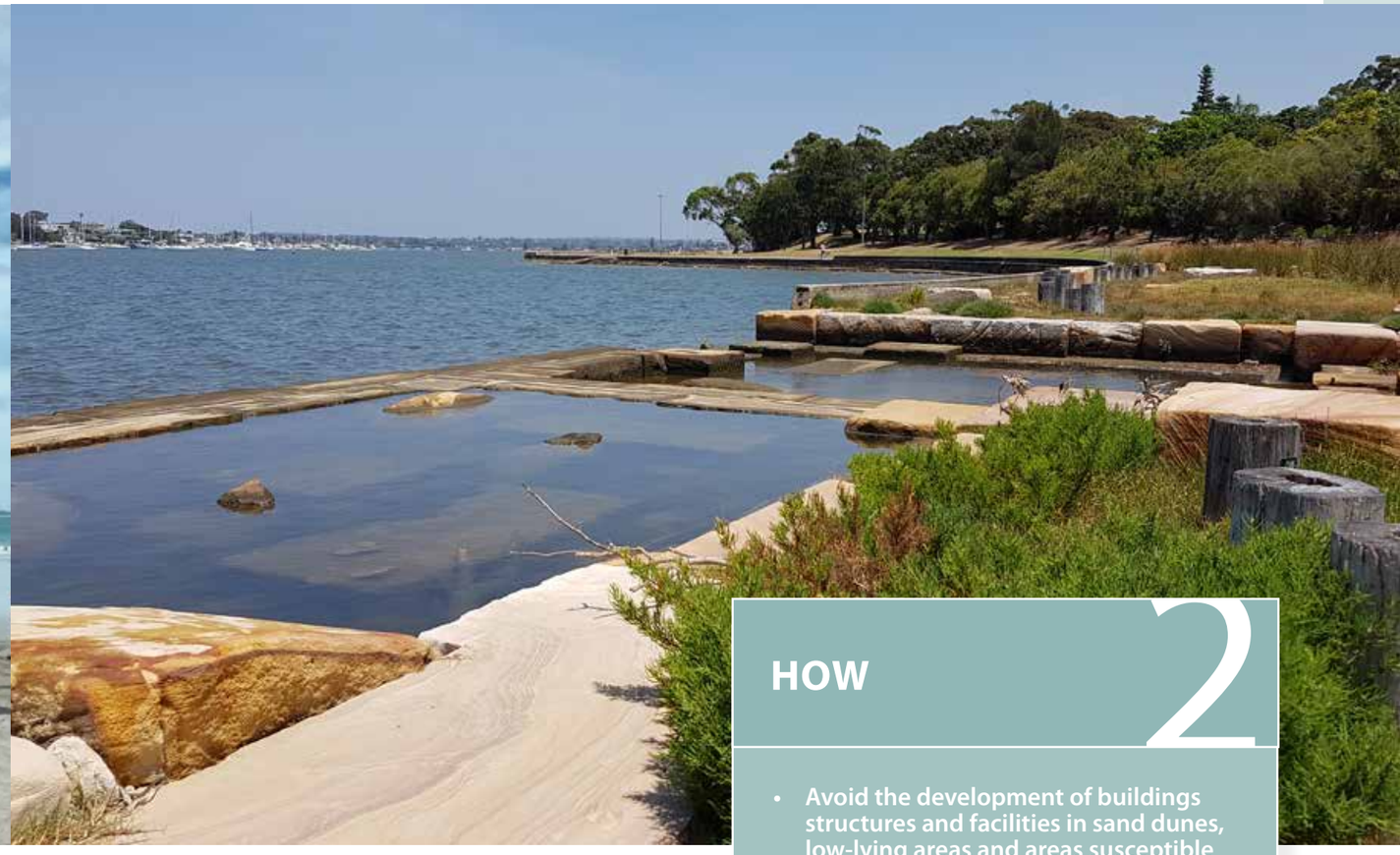
In response to these dynamics, the Marine and Coastal Policy directs that new developments and redevelopments avoid areas subject to coastal hazards, do not interfere with natural coastal processes, and accommodate biodiversity connectivity and adaptation.

Consider environmentally friendly construction principles and alternative solutions to hard engineering options in locations where it is necessary to control erosion, e.g. mixed rock sizing for habitat, vegetation planting for soil stability, beach re-nourishment



FUNDAMENTAL ELEMENT 2

The life-saving club structure minimizes its impact on the primary dune through the setback of the clubhouse behind the dune. A low impact, modular and movable observation structure provides an alternative to hard engineering options with the ability to be moved in response to dynamic natural coastal processes. (Inverloch Surf Life Saving Club, Victoria, Photo: DELWP)



Demonstrates an alternative engineering option for coastal protection rather than a seawall.
(Carss Bush Park foreshore, Kogarah Bay NSW
Photo: Tom Heath)

HOW 2

- **Avoid the development of buildings structures and facilities in sand dunes, low-lying areas and areas susceptible to coastal hazard risk, including future coastal hazard risk.**
- **Consider environmentally friendly construction principles and alternative solutions to hard engineering options in locations where it is necessary to control erosion, e.g. mixed rock sizing for habitat, vegetation planting for soil stability, beach re-nourishment, and the incorporation of wetlands, marshes and mangroves.**

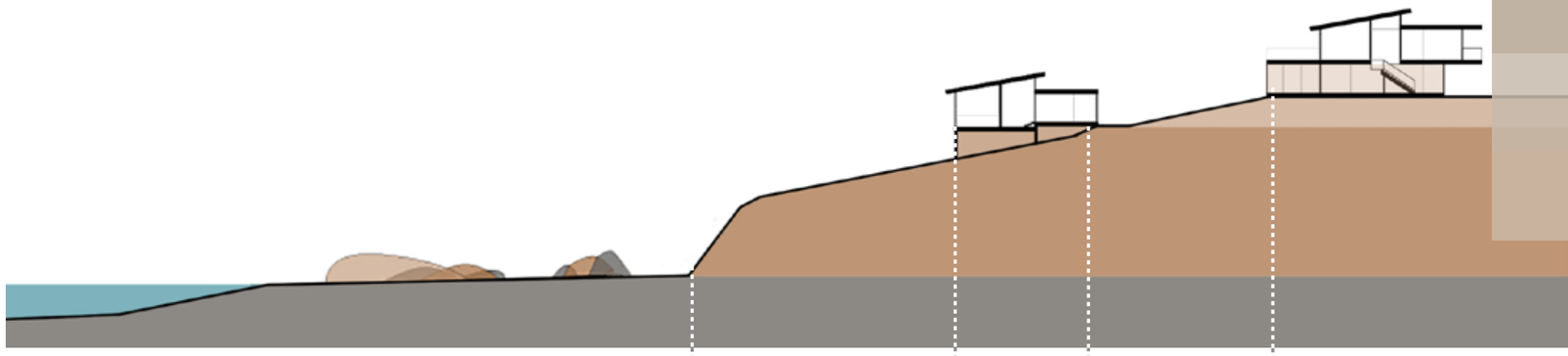
GEOLOGY

WHAT

Geology determines bedrock and soil conditions, drainage patterns and vegetation. The structure and characteristics of the different rock and soil layers provide useful insights into processes acting on the site over time, and are indicators for appropriate structures, materials and construction techniques. The Victorian coast has many different rock, soil and substrate types. These include granite rock outcrops from volcanoes, limestone cliffs, sedimentary hills, sand dunes, and fine sediments in wetland areas.

WHY

Understanding the site's geology allows structural siting and design to 'fit' with the surrounding landscape and form a deep connection to place. Siting and designing structures for minimal impact can reflect the geology of the site. Geological insights introduce a 'sense of place' by using compatible materials, colours and textures.



STRUCTURE AS ANOTHER LAYER IN THE STRATA

HORIZONTAL SOIL STRATIFICATION

GEOLOGICAL SUBSTRATE

HOW 3

- Use materials that respond to the character of the geology and substrate of the site and surrounding area.
- Site the structure to minimise disturbance to soil and vegetation.
- Minimise cut and fill.
- Use construction techniques that maintain natural slope.
- Minimise disturbance to sites of geomorphological significance and fossils.

Lookout design uses materials that are sympathetic to the local geology. Materials and simple geometric forms minimize site disturbance whilst maximizing viewing opportunities of the surrounding landscape. (Car de Creus Spain, Photo: Pau Ardevol)

Building materials respond to the natural geology and substrate of the site. The siting of the building encompasses natural geological formations and minimises disturbance to soil and vegetation.
(Pound Ridge House, New York, Photo: Peter Aaron/OTTO/Raven & Snow)

Lookout design uses materials that integrate with the site geology and surrounding landscape. Siting minimizes ground disturbance and maintains natural slope.
(The Askvagen Outlook, Norway, Photo: Roger Ellingsen)

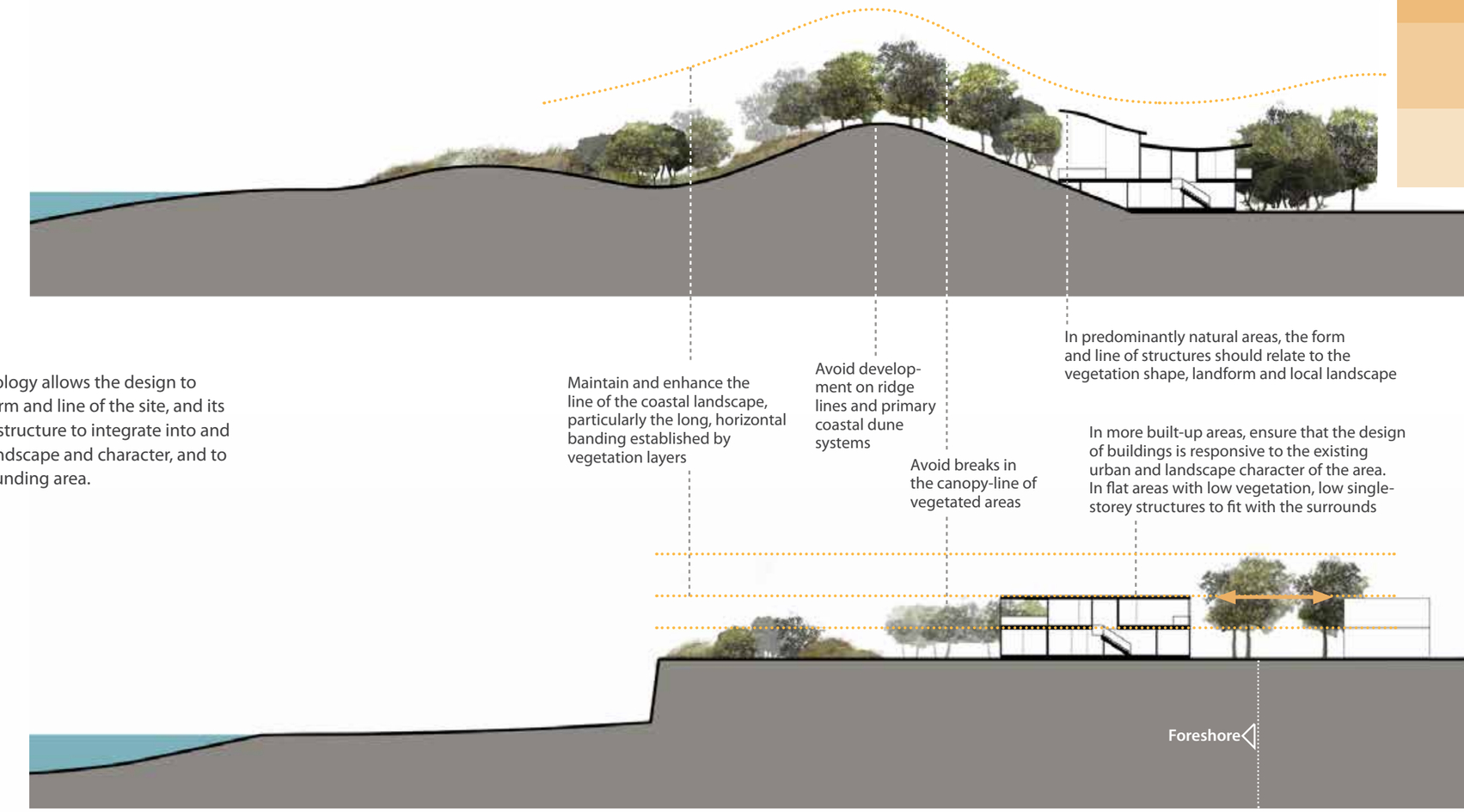
MORPHOLOGY

WHAT

Morphology is the shape and character of the land formed through the interaction of water, rain, weathering and earth movement. This can appear as plains and mountains or smaller features, such as hills and valleys. Morphology includes both the form of the underlying landscape (e.g. slopes and hills) and line of above-ground site features (e.g. tree masses, vegetation forms and buildings).

WHY

Understanding morphology allows the design to follow the dominant form and line of the site, and its surrounds. It helps the structure to integrate into and maintain the coastal landscape and character, and to complement the surrounding area.



FUNDAMENTAL ELEMENT 4

The low-lying rectangular form of the building reinforces the long horizonal vistas and low vegetation of the landscape. The structure fits with the low vegetation and dune landform of its surrounds. (Seaford Life Saving Club, Seaford, Photo: John Gollings)

HOW 4

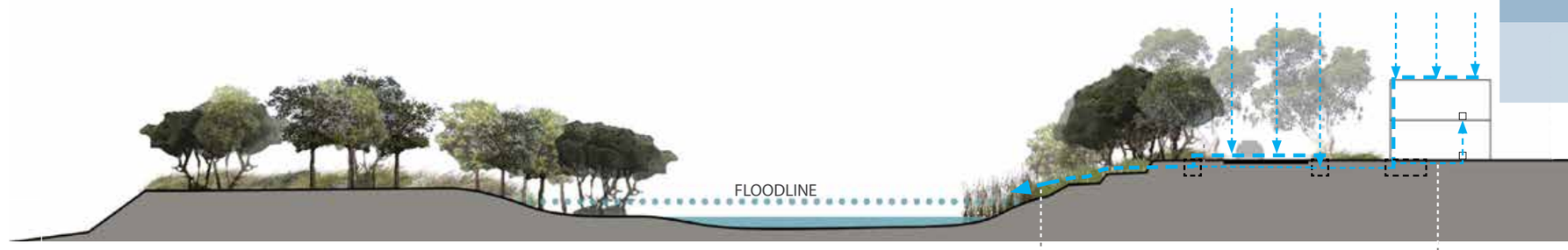
- **Maintain and enhance the line of the coastal landscape, particularly the long, horizontal banding established by vegetation layers.**
- **Avoid breaks in the canopy-line of vegetated areas.**
- **Avoid development on ridgelines and primary coastal dune systems.**
- **In more built-up areas, ensure that the design of buildings is responsive to the existing urban and landscape character of the area.**

In predominantly natural areas, the form and line of structures should relate to the vegetation shape, landform and local landscape. For example:

- **in flat areas with low vegetation, low single-storey structures to fit with the surrounds**
- **in sloping treed locations, split-level buildings with roof lines that follow the slope and vegetation.**

The visitor centre structure uses the form of the building as a response to the lines of the surrounding landscape. The siting responds to the natural landscape and local morphology. (The Trollisgen Visitor Centre, Romsdalen, Norway, Photo: Jarle Waehler)

HYDROLOGY



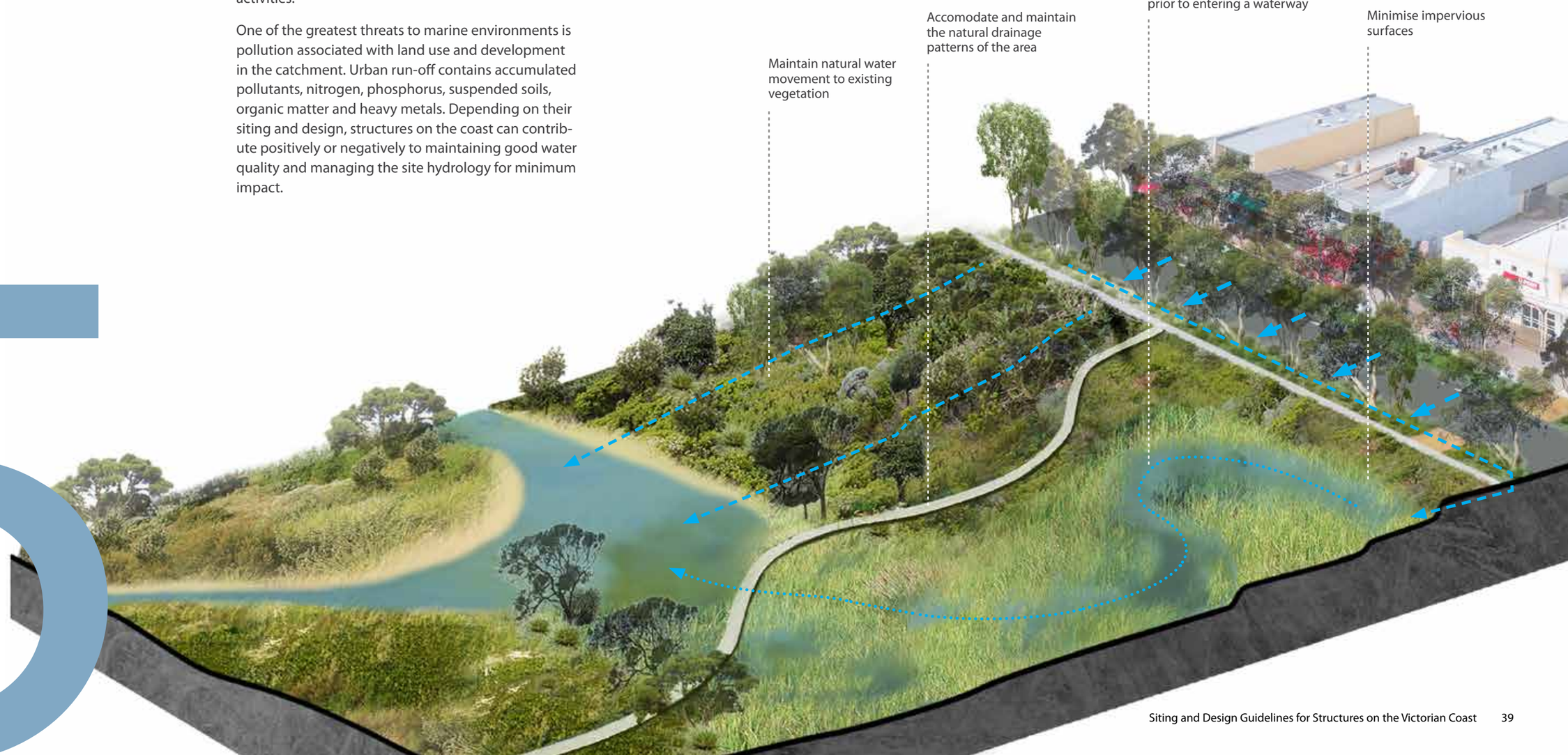
WHAT

Hydrology is the movement, distribution and quality of surface, ground and marine waters, on and through a site. Water catchments are connected from top to bottom so what happens throughout the catchment has a strong influence on water quality in the coastal, estuarine and marine environments.

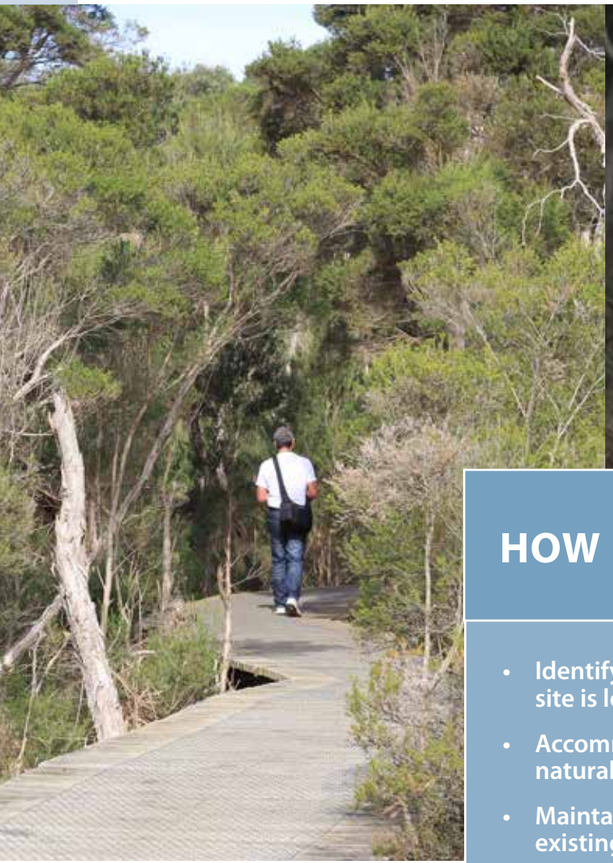
WHY

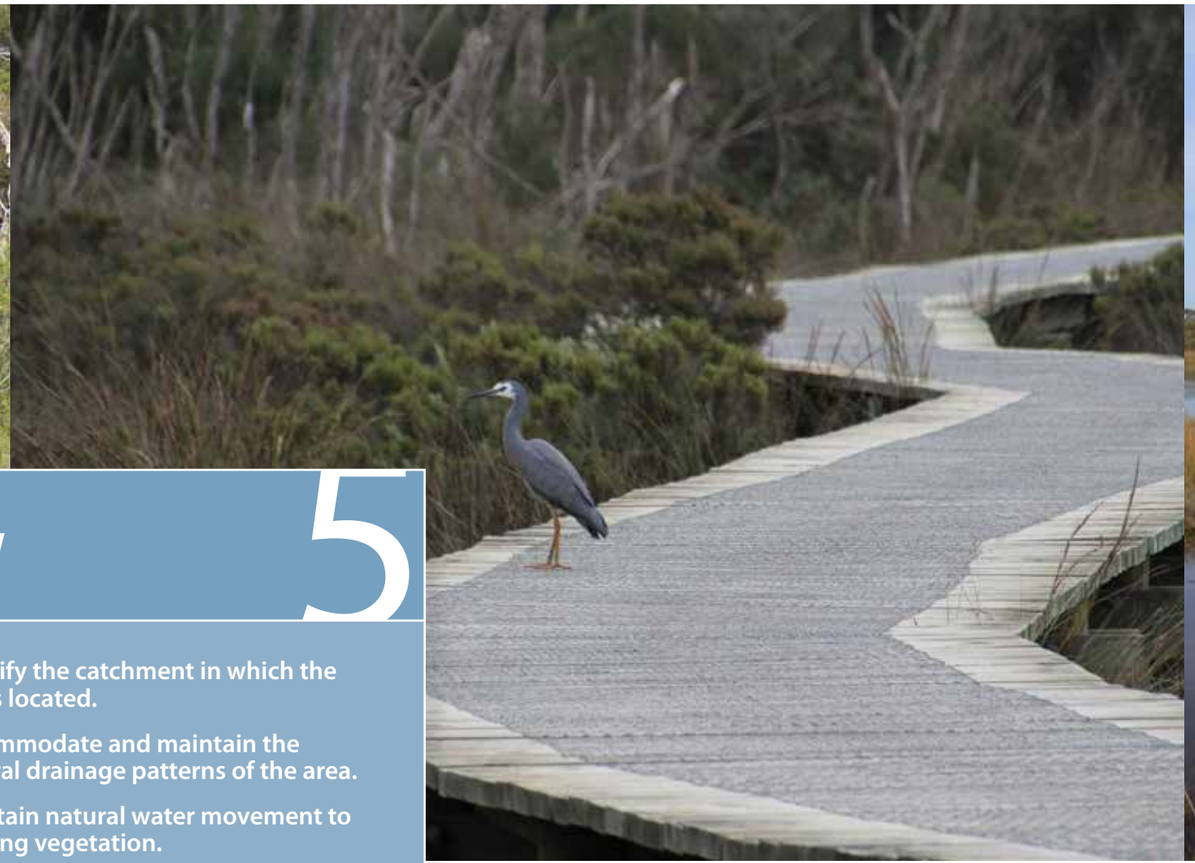
Healthy wetlands, estuaries and the marine environment maintain coastal biodiversity and, in turn, provide safe and clean swimming, recreational and commercial fishing, and tourism opportunities. Good water quality is essential for these environments and activities.

One of the greatest threats to marine environments is pollution associated with land use and development in the catchment. Urban run-off contains accumulated pollutants, nitrogen, phosphorus, suspended soils, organic matter and heavy metals. Depending on their siting and design, structures on the coast can contribute positively or negatively to maintaining good water quality and managing the site hydrology for minimum impact.



FUNDAMENTAL ELEMENT 5





HOW 5

- Identify the catchment in which the site is located.
- Accommodate and maintain the natural drainage patterns of the area.
- Maintain natural water movement to existing vegetation.
- Identify stormwater and surface run-off paths and design for the interception and treatment of these prior to entering a waterway.
- Minimise impervious surfaces.
- Hold and re-use water on site to eliminate increased run-off.

The boardwalk infrastructure accommodates and maintains natural drainage patterns and site vegetation while providing access and viewing opportunities.
(Bittern Coastal Wetlands Walk, Hastings, Photos: Katherine Cooper)

VEGETATION AND ECOLOGY

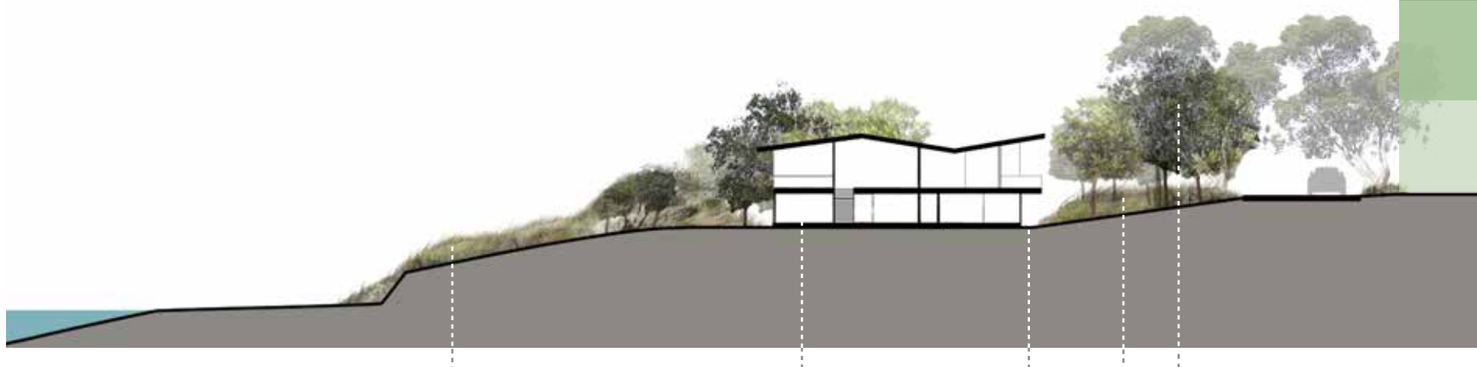
WHAT

Our coast has a wide range of habitats, including marine waters, beaches, dune systems, woodlands, windswept cliff tops, heathlands and dry forests. Each supports a diversity of plants and animals, including migratory shorebirds and seabirds. In terms of vegetation, wind, salt and unstable low nutrient soils made largely of sand that hold little water are the critical influences on the vegetation of the coast and plant communities. This also includes marine and estuarine environments which support fragile seagrass and mangrove communities.

WHY

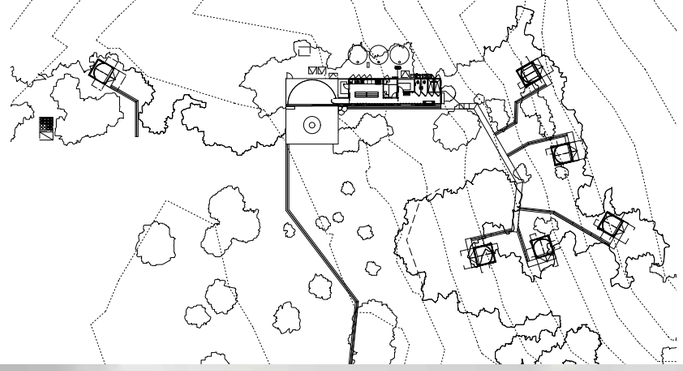
For siting and design, vegetation plays an important role in creating landscape character and defining elements of line, form, texture and colour. While management practices such as fuel reduction and weed management are necessary, vegetation also plays an important role in binding soils and sands, and helps prevent erosion by slowing soil movement.

A challenge for coastal managers is to maintain healthy and diverse coastal ecosystems in areas where access to the coast is in high demand. Population growth, increasing use and development, pests, weeds and a changing climate all threaten marine and coastal ecosystems and the biodiversity of an area.



FUNDAMENTAL ELEMENT 6

The building design incorporated modules which were carefully airlifted into place to minimize any impact on existing vegetation. Structures are grouped with common and carefully sited access boardwalks.
(The Standing Camp – krakani lumi, wukalina, Mt William National Park, Tasmania
Architect: Taylor and Hinds Architects, Photo: Adam Gibson)



Site Plan
(The Standing Camp – krakani lumi
wukalina, Mt William National Park, Tasmania
Architect: Taylor and Hinds Architects)

(Photo: Jordan Davis)

HOW 6

- **Site and design structures to avoid impacts on existing vegetation (avoid).**
- **Minimise disturbance to native vegetation by grouping structures and providing common access points (minimise).**
- **Encourage natural regeneration and extensive replanting of native species (replace).**
- **Design plantings (or utilise existing plantings) to direct access and movement.**
- **If replanting, use native species, where possible of local provenance, and restore the natural hierarchy of trees, shrubs and groundcovers.**
- **Minimise loss of vegetation during construction, including marine and estuarine vegetation communities such as seagrass, saltmarsh and mangroves.**

Structures have been designed and sited for minimal disturbance to existing vegetation. Existing vegetation has been incorporated into the design to direct access and frame views of the main pavilion.
(Photo: Adam Gibson)

CLIMATIC CONDITIONS

WHAT

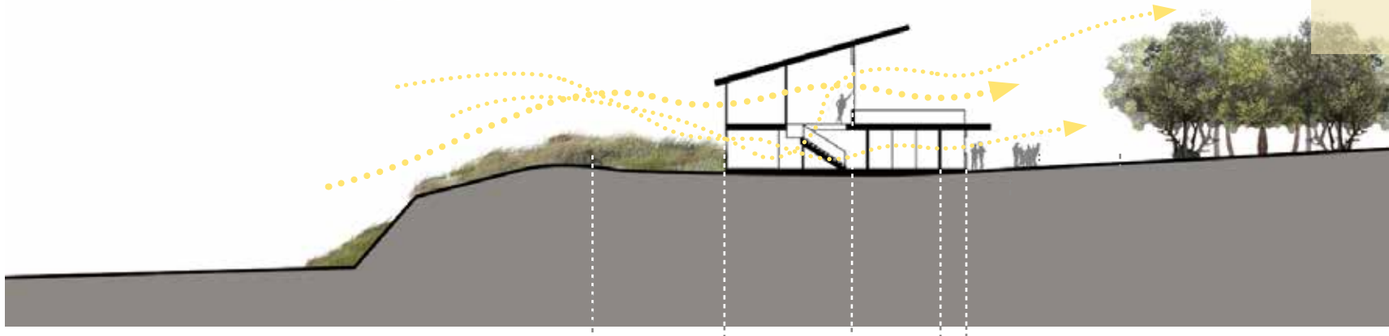
Climatic conditions include the impact and influence of wind, weather and sun on buildings and the surrounding environment, which influences heating, cooling, shade and the amenity of structures. Useful local climate information includes temperature and humidity range (seasonal and diurnal, i.e. day–night); direction of cooling breezes, hot, cold and wet winds; seasonal characteristics; extremes; and the impact of adjacent buildings and existing landscape. Wind and shade are critical considerations in the coastal environment for structural integrity, siting and design.

Wind force and exposure depends on the individual site and its aspect. Structures in coastal areas that are adjacent to flat expanses of water (which offer little resistance to wind speed) are more exposed to wind forces and solar reflection. Buildings on cliff tops and bluffs are even more exposed due to accelerating winds on the cliff-face and their height above the natural terrain.

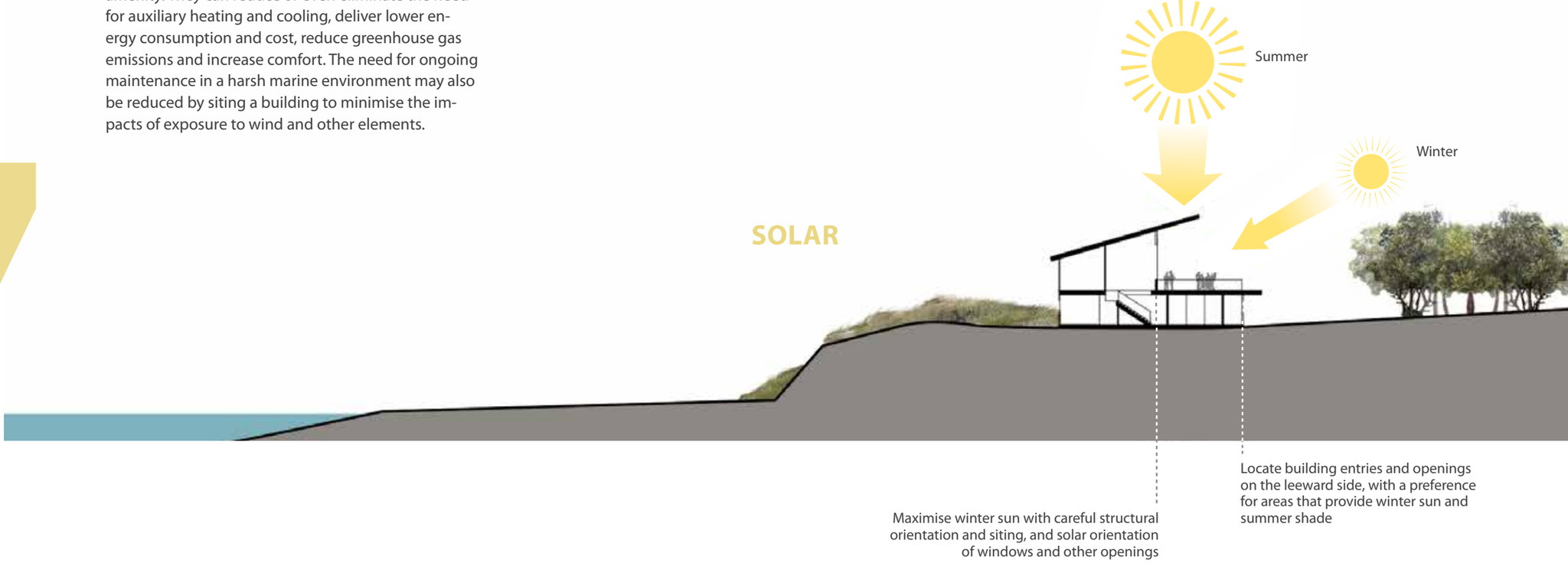
WHY

Well-orientated structures and spaces provide better amenity. They can reduce or even eliminate the need for auxiliary heating and cooling, deliver lower energy consumption and cost, reduce greenhouse gas emissions and increase comfort. The need for ongoing maintenance in a harsh marine environment may also be reduced by siting a building to minimise the impacts of exposure to wind and other elements.

WIND



SOLAR



FUNDAMENTAL ELEMENT 7

HOW 7

- Optimise thermal performance and natural light.
- Where internal comfort is important, the design should:
  - **maximise winter sun with careful structural orientation and siting, and solar orientation of windows and other openings**
  - **minimise heat loss with insulation of walls, floors and ceilings**
  - **facilitate cross-ventilation by appropriate location of windows and doors**
  - **make use of the thermal capacity and performance of building materials to minimise internal temperature fluctuations.**
- Manage exposure to wind and solar by considering:
  - **setting structures as far back from the shoreline as possible**
  - **siting structures away from elevated, exposed sites**

    grouping buildings
  - **planting vegetation on the windward side**
  - **locating building entries and openings on the leeward side, with a preference for areas that provide winter sun and summer shade.**

The building design optimizes thermal performance and natural light through the use of movable timber batten screens. Internal spaces can be adapted to maximise thermal comfort by moving the screens according to season and time of day. (Seaford Life Saving Club, Seaford, Design: Robert Simeoni Architects, Photo: John Gollings)

Exposure to wind and solar penetration is managed through careful orientation of building elements. (Seaford Life Saving Club, Seaford, Design: Robert Simeoni Architects, Photo: John Gollings)

Timber batten screens optimize natural light and facilitate cross ventilation but can be adjusted to provide protection from prevailing winds or shield against summer sun. (Seaford Life Saving Club, Seaford, Design: Robert Simeoni Architects, Photo: John Gollings)

VIEWS

WHAT

Views of the ocean, beach, coastal lakes, estuaries and hinterland hills are important aspects of living on, visiting and using the coast. Victoria has many spectacular views of the ocean and different landscapes, including Port Phillip Heads, the Twelve Apostles, the Great Ocean Road, the wilderness coast near Mallacoota Inlet and the Gippsland Lakes. Significant landscapes and views have been identified in a number of landscape assessment studies. Some of this information has been translated into planning schemes and forms an important consideration for permit approvals.

WHY

Ocean and beach views greatly enrich our coastal experience and connection with nature. It is important to frame, maintain and optimise existing views of unique features through careful siting and design that does not involve the removal of vegetation or intrusion into existing or potential view lines. Our preference for being able to see the ocean and coast is reflected in property prices, where the cost of properties with ocean and beach views is considerably higher than elsewhere. We are fortunate that most of our coast is in public ownership so everyone can enjoy coastal views without a prohibitive cost. It is crucial we maintain existing views and ensure that structures do not detract from our viewing experience.

8 FUNDAMENTAL ELEMENT

The simple horizontal surface of these stairs provides multi-functional seating and public viewing opportunities whilst minimizing intrusions into views of the natural environment. (The rest area in Kleivodden, Norway Photo: Jarle Waehler)

Structure enriches and frames views to and from the water without intruding into the natural landscape. (Trail head, shelter and wayfinding GASP Tasmania, Photo: Ben Hosking)

Structure is sited to fit seamlessly into the natural landscape whilst simultaneusly enriching and framing views to and from the coast. (Shelter at GASP, Tasmania, photo: Ben Hosking)

HOW 8

- **Minimise intrusions into public views of the natural environment.**
- **Retain important public views to and from the water or along the coast.**
- **Enrich and frame existing public views to and from the coast.**
- **Locate structures so that they are visually unobtrusive from public areas of beach, foreshore and the water.**
- **Minimise and group vertical elements (poles, signs, communications towers).**

PUBLIC OPEN SPACE

WHAT

Public open space should be designed to optimise our visual and spatial experience. Our experience should include a clear sense of vehicle and pedestrian routes that are organised to contain a sequence of events and views along the way. Larger open spaces can be organised into a series of small interrelated spaces to provide convenience to different groups and users, as well as privacy in a secure environment.

We need to optimise compatibility between and within activities. For example, supervision areas should not be separated from playground equipment by a bike path. The placement of furniture and signs should also be carefully coordinated to optimise views.

WHY

Open space developments need to function well and cater for a variety of uses. Shade, seating, safe surfaces, comfortable gradation of paths and protection from loud noise should all be considered when designing public open space.

The boardwalk optimizes compatible activities through the integration of infrastructure (board walk), furniture (seats) and open space to provide a series of interrelated community spaces and activity areas. The boardwalk provides a clear sense of arrival and pedestrian access to the foreshore.
(Keast Park Boardwalk Carrum, Victoria, Design: Site Office Landscape Architects, Photo: Cory Manson)

FUNDAMENTAL ELEMENT

9

The siting and design of this pathway encompasses a sequence of visual and spatial experiences that locates furniture and other elements so they do not intrude into the landscape.
(Rest area in Kleivodden, Norway Photo: Roger Ellingsen)

HOW 9

- Create a clear sense of arrival, and pedestrian routes that provide a sequence of visual and spatial experiences.
- Set carparking back as far as possible from the shoreline.
- Encourage off-site carparking with minimal on-site arrangements for service, emergency and drop-off access.
- Identify and provide for user groups in inter-related spaces.
- Optimise compatible activities and inter-activity relationships.
- Locate furniture, signage and other landscape elements so they complement circulation and interconnectivity patterns.

This bush trail and seating area incorporates a series of lookouts and boardwalks that have been sited and designed to provide for user groups without impeding views to and from the water and surrounding landscape. (The Narabeen Lagoon Multi-use Trail, NSW, Photo: Simon Wood)

LOCAL CHARACTER AND SENSE OF PLACE

WHAT

Victorians value the often long-standing character of coastal settlements (Ipsos, 2012). There also continues to be strong support for maintaining coastal character through inland development, rather than creating continuous urban settlements along the coast.

At a local scale, it is important that a particular character of a coastal town or the elements that create its 'sense of place' are not compromised by the poor siting and design of structures.

WHY

Our affinity for the sea and its resources continues to draw people to the coast. Increasing numbers of tourists and those wanting a 'sea change' are creating pressure for increased development in coastal settlements. Associated urban and landscape changes associated with such development often threaten the very qualities that make up the character and attraction of a place. In particular, the local natural beauty, cultural connections and fragile ecosystems need to be carefully considered.

HOW

- Consider the distinctive environmental, social and cultural features contributing to the character of place (geology, ecology and architecture).
- Design structures to fit and blend with the surrounding character and landscape.
- Avoid extreme contrasts in design, scale and shape.
- Avoid visual prominence in highly visible locations.

The viewing tower resembles the 2 lighthouses of Queenscliff and provides a link back to the town and local setting. The harbour includes cafes and restaurants and allows direct public access to the water to support broader use and enjoyment of the area. (Photo: Sophie Noss)

FUNDAMENTAL ELEMENT 10

HERITAGE

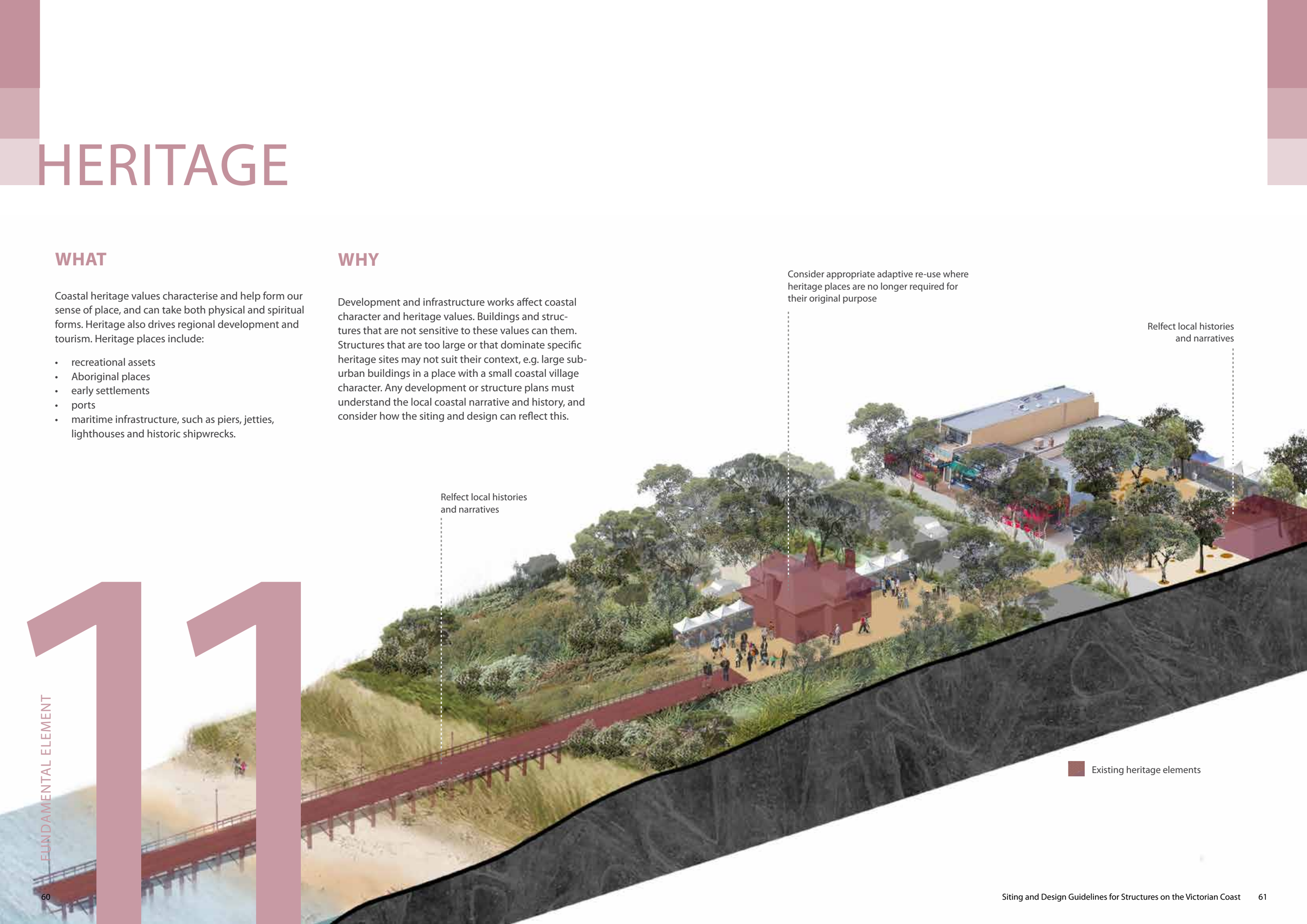
WHAT

Coastal heritage values characterise and help form our sense of place, and can take both physical and spiritual forms. Heritage also drives regional development and tourism. Heritage places include:

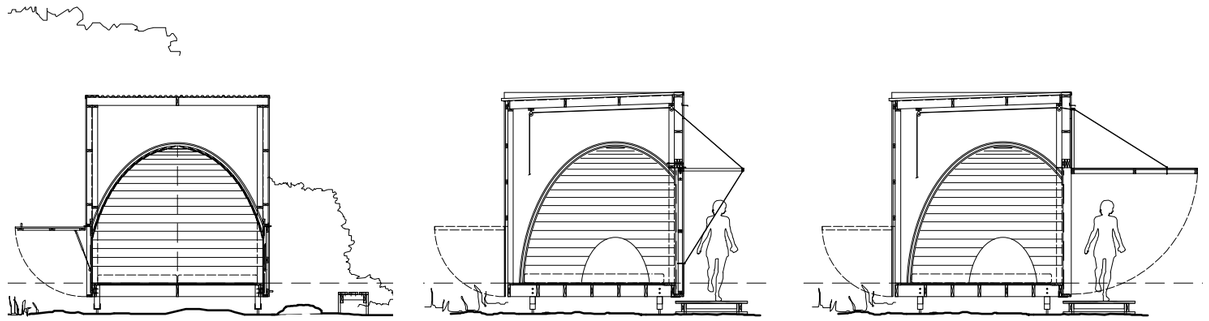
- recreational assets
- Aboriginal places
- early settlements
- ports
- maritime infrastructure, such as piers, jetties, lighthouses and historic shipwrecks.

WHY

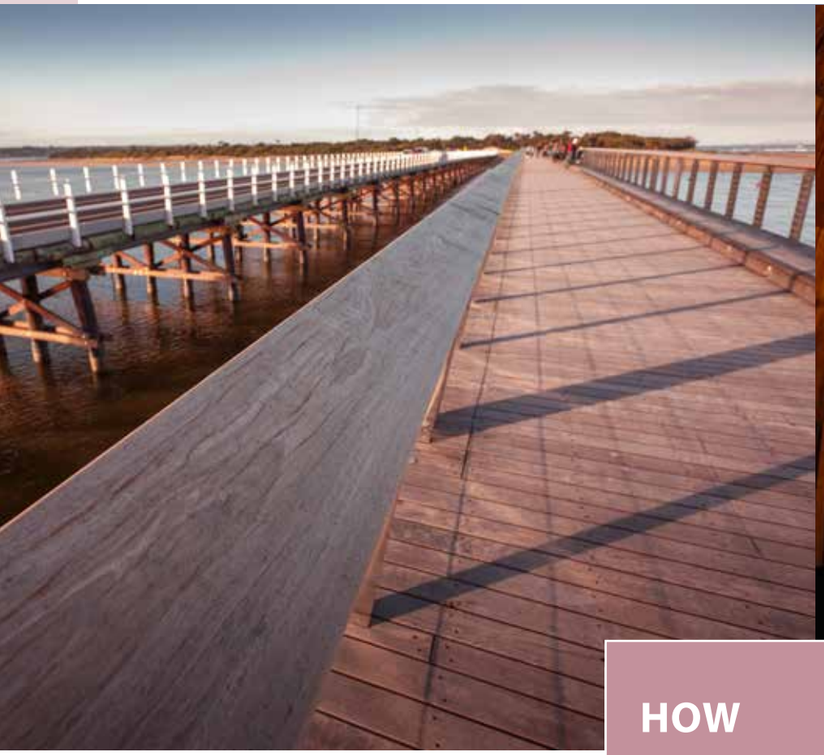
Development and infrastructure works affect coastal character and heritage values. Buildings and structures that are not sensitive to these values can them. Structures that are too large or that dominate specific heritage sites may not suit their context, e.g. large suburban buildings in a place with a small coastal village character. Any development or structure plans must understand the local coastal narrative and history, and consider how the siting and design can reflect this.



11 FUNDAMENTAL ELEMENT



Elevation
(The Standing Camp – krakani lumi wukalina, Mt William National Park, Tasmania Architect: Taylor and Hinds Architects)



This pedestrian and cycling bridge is built alongside a reconstructed heritage timber road bridge. It's contemporary structure adapts to new use of place whilst reflecting local history and narrative in its material and aesthetic qualities (The William Buckley Bridge, Barwon Heads, Victoria, Design: Peter Elliot Architecture + Urban Design, Photo: Sean McPhillips)

In this structure indigenous cultural heritage is expressed and embedded in an integrated approach where the proportions and materials are inspired by the form and qualities of the traditional seasonal shelters of Tasmania's first peoples. (The Standing Camp – krakani lumi, wukalina, Mt William National Park, Tasmania, Architect: Taylor and Hinds Architects, Photo: Adam Gibson)

The exterior charred 'skin', of these structures embeds the story of the Aboriginal community while at the same time resonating with the natural and cultural setting. (Photo: Adam Gibson)

11 HOW

- **Identify and protect heritage places.**
- **Reflect local histories and narrative.**
- **Consider appropriate, adaptive re-uses where heritage places are no longer required for their original purpose.**
- **Avoid dominate structures that are not sympathetic to local heritage or character.**

PUBLIC ACCESS

WHAT

Victorians are fortunate to have 96 per cent of coastal foreshore in public ownership. Many parts of the coast are very accessible with high-quality facilities. General public access to the coast is a central policy platform and access to the coast is provided for pedestrian, vehicular and marine uses and activities at appropriate locations.

WHY

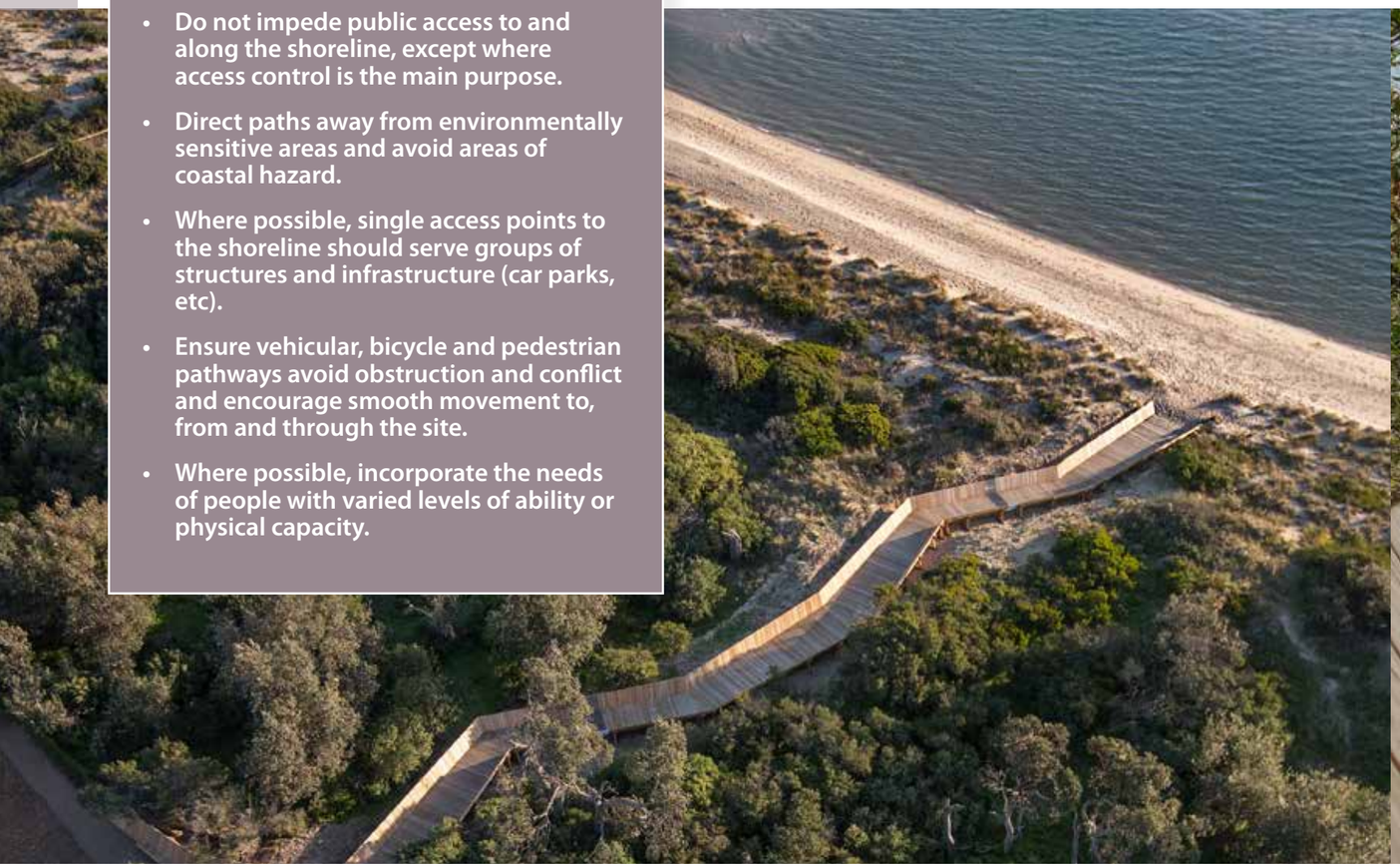
Buildings and structures should be sited and designed to allow public access to, from and along the coast for a range of people and their abilities.

FUNDAMENTAL ELEMENT

12

HOW 12

- Do not impede public access to and along the shoreline, except where access control is the main purpose.
- Direct paths away from environmentally sensitive areas and avoid areas of coastal hazard.
- Where possible, single access points to the shoreline should serve groups of structures and infrastructure (car parks, etc).
- Ensure vehicular, bicycle and pedestrian pathways avoid obstruction and conflict and encourage smooth movement to, from and through the site.
- Where possible, incorporate the needs of people with varied levels of ability or physical capacity.



The boardwalk provides a single access point to the shoreline protecting environmentally sensitive areas. (The McCullough Avenue Boardwalk, Victoria, Design: Site Office Landscape Architects, Photo: Lisbeth Grosmann)

The boardwalk protects the coastal dunes from intrusion and erosion by encouraging clear and controlled movement to and from the beach. (Photo: Lisbeth Grosmann)

INCREASED FUNCTION AND ADAPTABILITY

FUNDAMENTAL ELEMENT

13

WHAT

The coast is constantly changing as a result of its dynamic physical character and changes in use over time. Given the high value placed on coastal land, structures should be sited and designed to not only complement and integrate existing functions but also to embed the consideration of future adaptation needs into their structural and locational foundation.

WHY

Coastal land is limited and demand for its use and development is high. It is also a sensitive and dynamic environment. Development needs to demonstrate maximum efficiency of use and flexibility of design. Coastal structures need to recognise an impermanent future and demonstrate innovation, agility and adaptability in siting and design that responds to changing coastal conditions, reduces risk and achieves coastal resilience.

An innovative sea wall at Sorrento demonstrates increased function with seating and viewing opportunities that at the same time minimises impacts of wave energy and protects coastal values. (Maw Civil Marine, Photo: Simon Bulk)

CLIMATE CONTROL

LOCAL/ RECYCLED MATERIALS

WETLAND TO REPLACE TRADITONAL STORMWATER OUTFALL

INCREASED BIODIVERSITY

ELEVATED BOARDWALK PROMOTES USEABILITY AND SUSTAINABILITY

HOW 13

- Avoid development where a protective structure is required to support a use or development on the coast or in the marine environment.
- Consider options to remove, retreat or relocate structures.
- Promote the grouping of structures, clustering of activities and shared use of facilities.
- Facilitate the rationalisation of existing buildings and car parks.
- Incorporate innovative construction techniques and materials to maximise flexibility of the structure.
- Consider relocatable or temporary structures that accommodate seasonal and peak use periods.

This structure incorporates innovative construction techniques to adapt to local conditions of erosion and sea level rise.
The pavilion is perched on two thick wooden sleds which maximise flexibility by allowing movement around the beach as erosion or weather conditions dictate.
(The Whanapoua Sled House, Coromandel Peninsula, New Zealand, Photo: Simon Devitt)

Deeper consideration of seawall structure demonastrates a layering of functions including coastal protection, coastal ecologies, use and access. (Carss Bush Park, Kogarah Bay NSW, Photo: Tom Heath)

The structure is a compact building featuring sustainable water-saving waste treatment system and flexible screens. It uses ecologically friendly materials and incorporates sustainable, closed-loop systems (a worm tank system to treat waste and two tanks for grey water that can be recycled). When not in use the building is 'boarded up' and blends in amongst the dunes. (The Whanapoua Sled House, Coromandel Peninsula, New Zealand, Photo: Jackie Meiring)

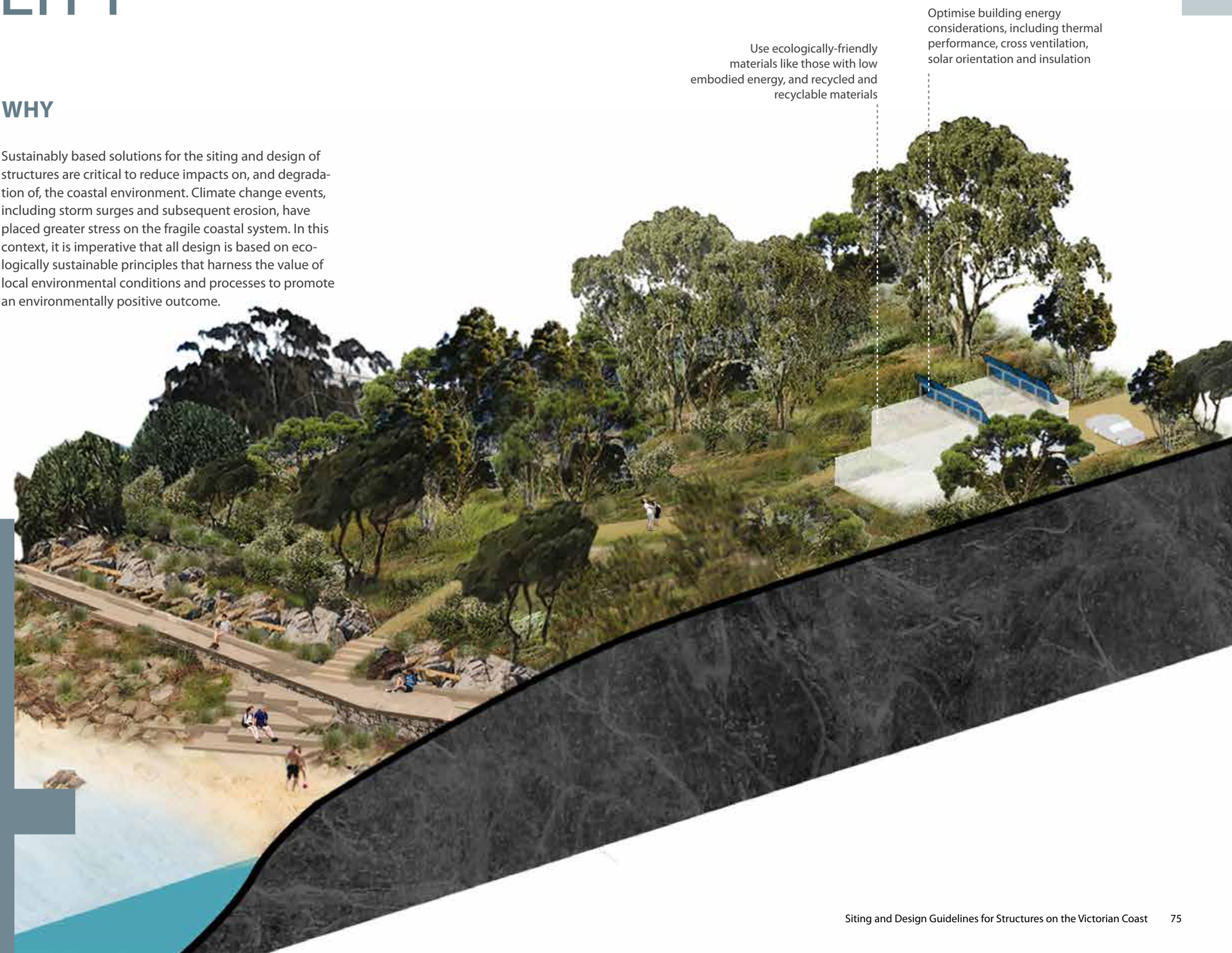
SUSTAINABILITY

WHAT

Services and utilities, including drainage, water usage and sanitation, have to be considered as part of siting and design. Traditionally, service infrastructure and building energy/heating and cooling systems have responded to immediate functional requirements with little consideration for their broader negative environmental impacts or impacts on coastal amenity.

WHY

Sustainably based solutions for the siting and design of structures are critical to reduce impacts on, and degradation of, the coastal environment. Climate change events, including storm surges and subsequent erosion, have placed greater stress on the fragile coastal system. In this context, it is imperative that all design is based on ecologically sustainable principles that harness the value of local environmental conditions and processes to promote an environmentally positive outcome.



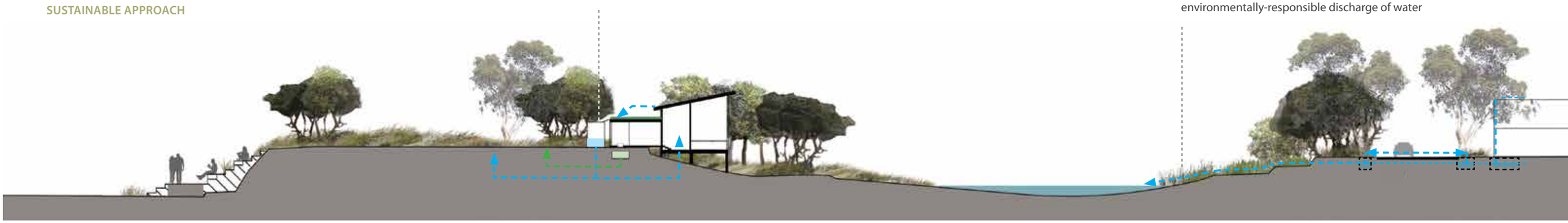
FUNDAMENTAL ELEMENT 14

HOW 14

- Replace traditional services with sustainable closed-loop systems, including the use of wind for power generation; solar for hot water; composting toilets; and collection, storage and re-use of water on-site.
- Optimise building energy considerations, including thermal performance, cross ventilation, solar orientation and insulation.
- Replace traditional stormwater outfalls with wetlands and biofiltration systems to enhance vegetation and habitat, and ensure environmentally responsible discharge of water.
- Use ecologically friendly materials, such as low embodied energy materials, recycled/recyclable materials.

TRADITIONAL APPROACH

SUSTAINABLE APPROACH



MATERIALS AND FINISHES

WHAT

The coastal landscape character of an area is expressed in its dominant colours and textures. Culturally modified areas have their own specific character based on past industry and land use, and associated appropriation of local materials. Some areas have a strong sense of place based on this character, often celebrating and reinforcing local geology.

WHY

While materiality is critical to a sense of place on the coast, so is the durability of materials used. Wave attack, winds, sand movement and corrosion take their toll, as does heavy public usage.

HOW

- **Use materials sympathetic to the coastal environment.**
- **Use the local colours and textures for any new structure.**
- **Use durable materials, fittings and finishes developed specifically for a coastal environment.**
- **Use low-embodied energy, recycled and locally-sourced materials where possible.**

FUNDAMENTAL ELEMENT 15

STANDARD MATERIALS PALETTE

Hardwood timber - plantation - grown and recycled timber treated for protection from insects and decay - Red Gum, Jarrah and Tallowood are most durable and suitable for structure is the water.
Photo: John Gollings

Reinforced polymer mesh - lightweight - chosen for its excellent anti-corrosive and low maintenance properties.
Photo: Roger Ellingsen

Steel - structural grade and hot dip galvanised as per AS/NZ 4680 for superior performance and powder coated for corrosive protection.
Photo: Jarle Waehler

Concrete - durable providing there is adequate cover to all reinforcement to prevent corrosion. Photo: Jarle Waehler

Glass - needs special consideration to avoid glare and reflection. Photo: Peter Aaron

Natural stonework - very durable and requires no special treatment. Photo: EMF Architects

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