

Eastern Road and Kendall's Wharf Coastal Defence Scheme

Protecting the future of our community



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Working together - protecting our coastline

EASTERN SOLENT | COASTAL PARTNERSHIP



Environment
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Shoreline Management Plan

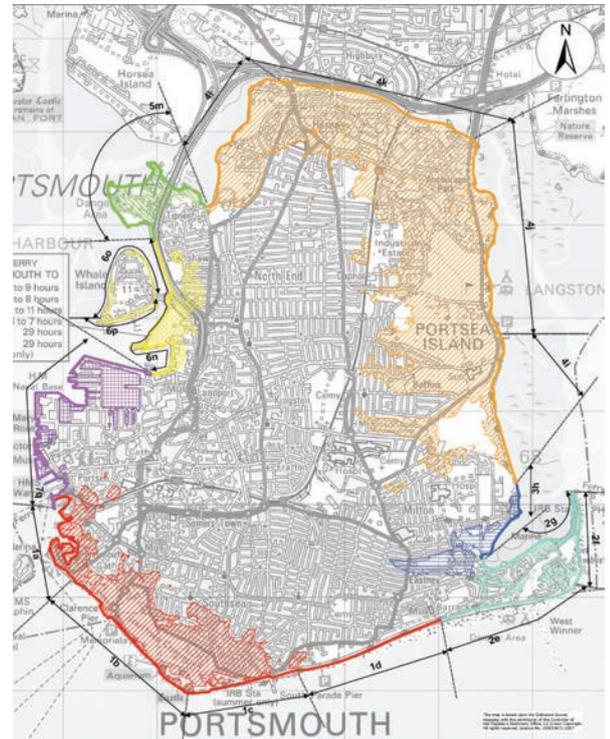
A Shoreline Management Plan (SMP) is a high level policy document setting out a framework for future management of the coastline.

The SMP aims to balance the management of coastal flooding and erosion risks with natural coastal processes and the effects of climate change.

The North Solent SMP covers the coastline from Hurst Spit in the west to Selsey Bill in the east and sets the policy for the whole of the Portsmouth coastline.

The SMP makes recommendations on how the coastline should be managed over the next 100 years.

A 'Hold the line' policy to maintain or upgrade the level of protection provided by the existing defences was identified for the North Portsea Island coastline by the North Solent SMP.



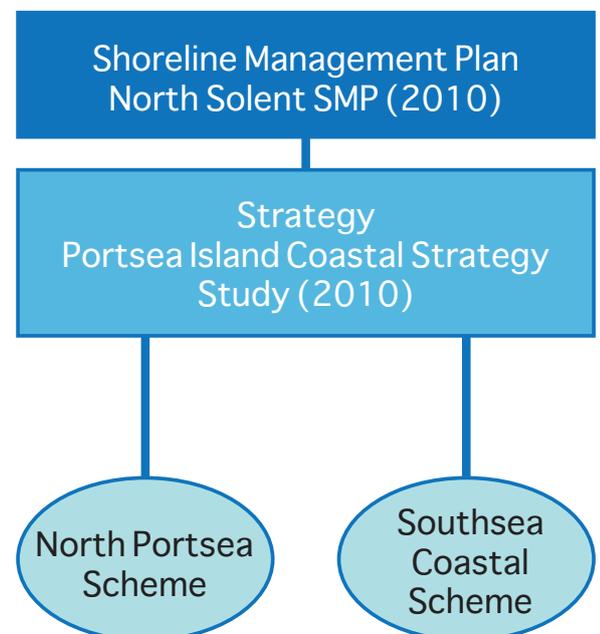
Portsea Island Coastal Strategy Study

A strategy looks at how the SMP policy can be implemented at a more local level and identifies areas where work may be required.

The Portsea Island Coastal Strategy Study (PICSS) was concluded in 2010. The strategy supported the recommendations of the North Solent SMP and adopted a 'Hold the line' policy for Portsea Island.

The strategy looked at the likely risk of coastal flooding to Portsea Island, the condition of existing defences and the number of properties and assets at risk in the event of flooding over the next 100 years.

Seven distinct flood cells were identified, meaning that a flood in one cell will not impact any other, and of those seven cells, two were identified as priority areas – Flood Cell 1 (Southsea) and Flood Cell 4 (North Portsea Island). The strategy identified significant risk to properties, businesses and key infrastructure within these two priority areas and proposed that schemes should be developed for these frontages.



Climate Change and Sea Level Rise



Portsmouth
CITY COUNCIL

Our responsibility

Scientists have determined that the temperature of central England has risen by almost 1°C over the last century. Winters are getting wetter and average sea levels are rising.

The long-term effects of climate change are uncertain however in some shape or form it will affect us all. With this in mind we must start taking action now to protect our coastline and ensure that our actions are sustainable for future generations.

Portsmouth City Council takes human-induced climate change very seriously. Many of the services it provides directly impact on the local economy and the environment. When developing the council strategy and how services are being delivered, the council always considers how these things could effect climate change and how communities can respond to the effects of climate change.



Rising sea levels

Relative sea level rise refers to the effective change in sea level relative to land surface and takes account long term land movement. The combined effect of these changes are predicted to result in an annual sea level rise in Southern England of about 6mm per year.

The rise in sea levels due to global warming is caused by thermal expansion of the oceans and to a lesser extent from melting of the ice caps and glaciers.

The relative rise in sea level is also caused by a phenomenon called Isostatic Readjustment. Effectively the north west of Britain is rising following glacial withdrawal at the end of the last ice age, thus causing the south-east of England to sink.



Extent and Risk of Flooding

Present day



2115



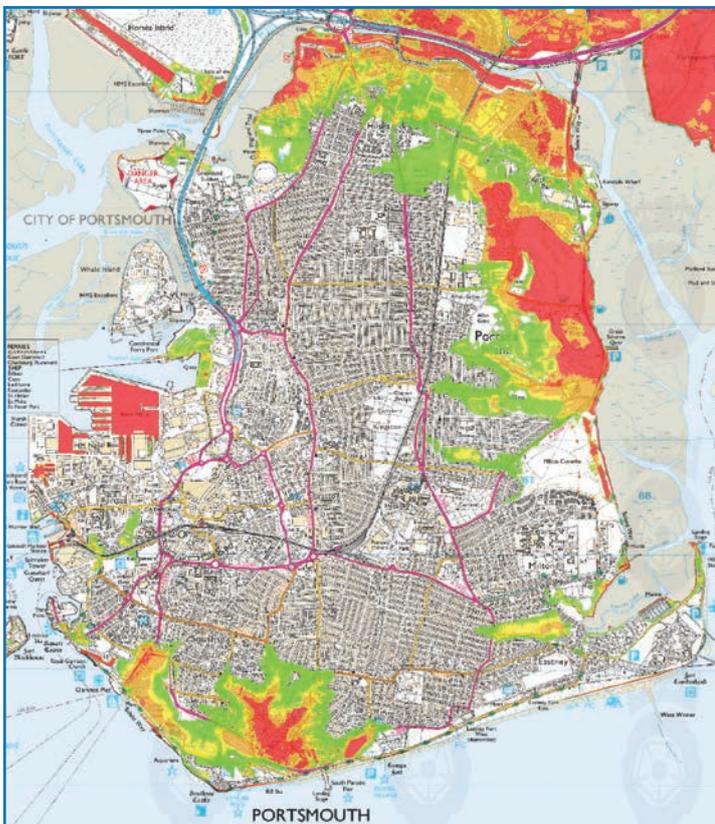
1,414 residential and 147 commercial properties are currently at risk from a 1 in 200 year tidal flood event. This increases to 4,234 residential and 490 commercial properties over the next 100 years.

North Portsea Island contains the only rail link and two of the three road links onto Portsea Island. 89 electricity sub-stations are also located within North Portsea Island. All of these assets are at risk from flooding during a 1 in 200 year tidal flood event.

These Flood Risk maps indicates the extent of flooding from a 1 in 200 year event if the coastline was left undefended.

The value of property and infrastructure within North Portsea Island is estimated at £642m.

Hazard map



This map indicates the level of risk from a present day 1 in 200 year flood event if the coastline was left undefended.

Definition of undefended flood hazard index as displayed on SFRA map set 1B

Classification	Description
Low	Caution Flood zone with shallow flowing water or deep standing water
Moderate	Dangerous for some people (i.e. children) Danger: Flood zone with deep or fast flowing water
High	Dangerous for most people Danger: Flood zone with deep fast flowing water
Very High	Dangerous for all people Extreme danger: Flood zone with deep fast flowing water

The Story So Far...

Eastern Road and Kendall's Wharf represent the fourth phase of construction of new coastal flood defences as part of the North Portsea Island Coastal Defence Scheme.

The full scheme extends from the Mountbatten Centre in the west, along Ports Creek in the north to Milton Common in the east and covers 8.4km of coastline.

Approved funding

A formal business case for the scheme was submitted to the Environment Agency (EA) to secure grant funding from central government.

Members of the project team attended a series of meetings with the EA's Large Project Review Group who scrutinise the business case against economic, technical, environmental and social factors.

In total £58m of funding has been approved to deliver the North Portsea Island Coastal Defence Scheme.

Licences and consents

Before we can start work onsite we must obtain the necessary licences and consents. These include planning permission; a Marine Licence from the Marine Management Organisation; and consent from Natural England to work within Langstone Harbour.

Part of our planning application includes an Environmental Statement which covers many aspects of the potential impacts of the construction work, it will include noise, wildlife and visual impact assessments.



Site investigations



Aerial photo of Langstone Harbour



Previous ESCP exhibition

Site investigations

To support the detailed design process we have undertaken a range of site investigations and surveys.

You may have seen us and our contractors carrying out structural investigations of the existing defences, undertaking topographical land surveys and drilling boreholes around the North Portsea Island coastline.

Ecological surveys

In order to understand the potential impacts that our work may have on local species of flora and fauna, we have worked with environmental specialists to carry out a series of surveys around Langstone Harbour along the Eastern Road.

These included detailed habitat surveys which recorded important plant and animal species in order to preserve and protect these habitats during the works.

Detailed design

The detailed design has been developed by a team of specialist engineers and architects. The design process has drawn upon the findings of site investigations and wave modelling. Extensive engagement is ongoing with key stakeholders along the frontage. Feedback received from public exhibition events held in March 2014, January 2015, April 2016, February 2017 and November 2018 has been incorporated.

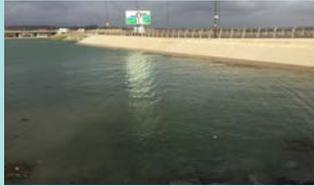
Completed Work

Anchorage Park

Anchorage Park was the first stage of the wider North Portsea Island scheme. The works consisted of earth embankments, rock revetments on the seaward side and a new concrete abutment for the Eastern Road bridge.

Eastern Road Bridge

As part of the works a new flood wall and revetment was constructed along the Eastern Road bridge.



Earth embankments

1.4km of new embankments from Kendall's Wharf to the railway bridge along Ports Creek have been constructed using a total of 56,000 tonnes of earth. Surfaces along the creek have been improved with wider paths and panoramic views from the new embankment.



Rock revetment

Rock revetments have been constructed along the seaward side of the earth embankments to protect them from erosion. The rock used for the scheme was imported from Larvik in Norway and was brought in by ship to Southampton. It was specially selected due to its strength and weather resistance. The rock is a waste product sourced from a quarry that produces high quality polished worktops and building façades.



Landscaping

Trees, shrubs and hedgerow were planted in areas across the site to provide natural screening and to replace any plants removed during the construction works. The earth embankments, haul routes and compounds were re-seeded with grass and wildflowers enhancing their natural character. An orchard of twelve fruit trees were planted in the meadow area to feed the birds and bees.



Milton Common and Great Salterns Quay

The Milton Common scheme covers 750m of coastline and included two key elements - construction of coastal defences and removal of Great Salterns Quay.

Great Salterns Quay

Material from the internal body of Great Salterns Quay was removed along with the retaining steel piles. A new section of the seawall was constructed where the quay joined the coastline. Removing the quay provided new habitat legally required to enable construction of the scheme.



Shoreline footpath

The existing coastal path was replaced with a new improved path along the top of the rock revetment. The new path has an improved surface and offers a pleasant route to cycle or walk along the coast.



Bunds

Chalk bunds were constructed behind the rock revetment to provide the flood defence, and were constructed from the excavated chalk material from Great Salterns Quay. New paths have been constructed along the top of the new bunds and have been tied in to the existing footpath network on the common.



Landscaping

Seed mixes, shrubs and trees were specially selected to enhance the natural biodiversity of the area.



Tipner Lake Progress

This phase of work is from the Mountbatten Centre, Twyford Avenue to the Ports Creek Roundabout and forms Phase 3 of the North Portsea Island Scheme. Construction started in April 2017, with completion expected in autumn 2019.

Project Timeline

Storm event
2016



April
2017



April
2017



May
2017



July
2017



Nov 2017-April 2018
Winter period



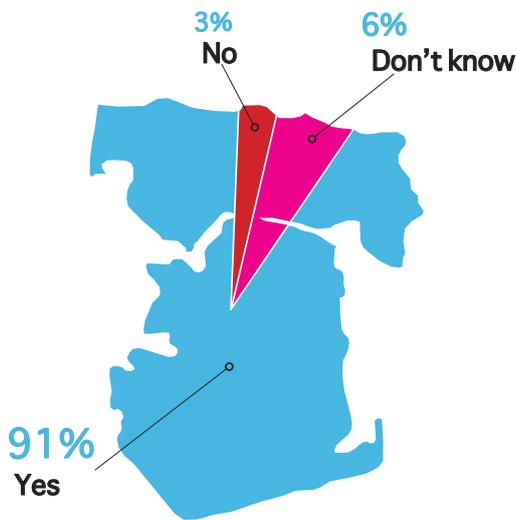
August
2019

What you told us

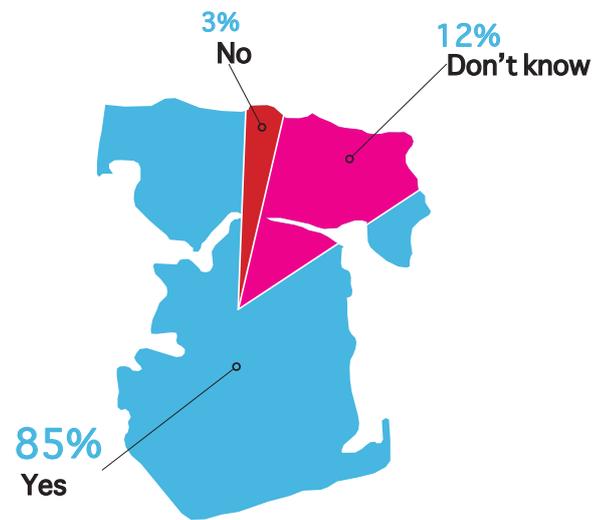
Public consultation on the shortlist of options for the North Portsea Island Coastal Flood and Erosion Risk Management Scheme was undertaken in 2014.

- Four consultation events were held at different locations across North Portsea Island, the project team engaged with the public via clip board surveys outdoors around the North Portsea Island coastline.
- The public were also directed to consultation material on the ESCP website and encouraged to complete the online feedback questionnaire.
- A total of 364 questionnaire responses were received.

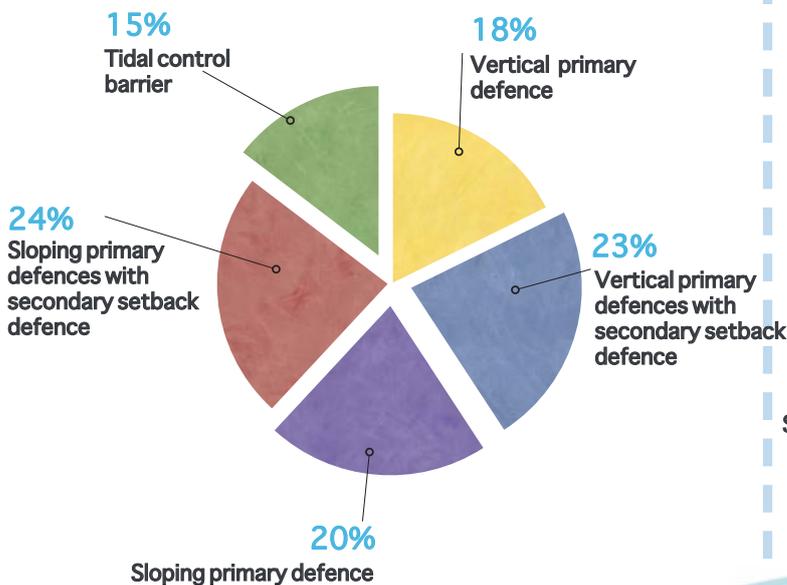
Do you believe there is a need to reduce the risk of flooding and erosion around North Portsea Island?



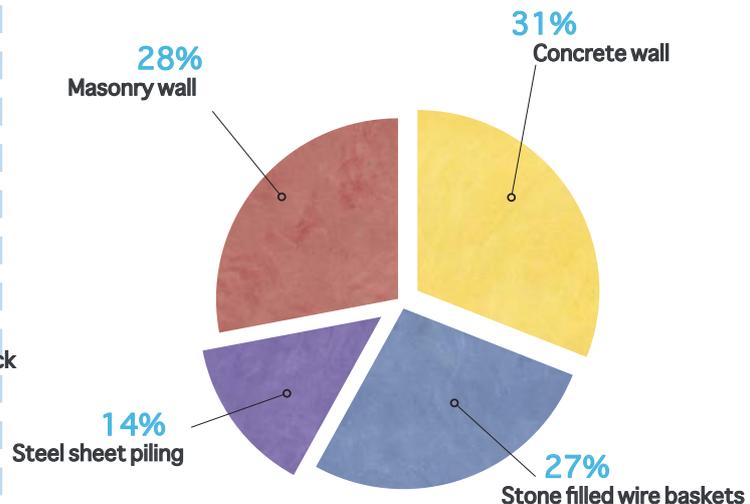
Do you believe there is a need for new sea defences around North Portsea Island?



The overall scores for each coastal defence option are shown in the chart below



Material preference for vertical wall



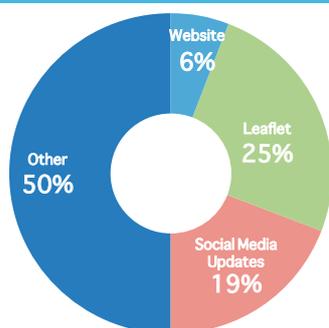
Feedback from residents

These results are from the three public exhibition events in November 2018, held to present the detailed design from Eastern Road and Kendall's Wharf coastal defence scheme.

100% of those responding to our feedback form understood why the defences were being constructed

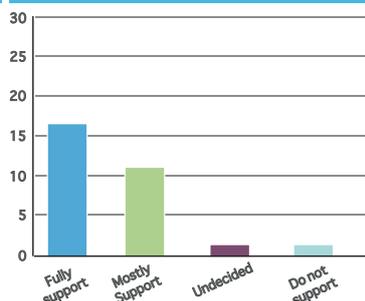


How did you hear about this exhibition event?

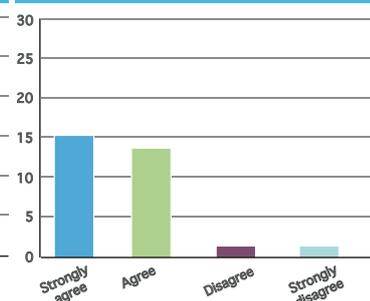


- Other...
- Word of mouth
 - Tudor Sailing Club
 - Sign outside venue
 - Portsmouth News newspaper

Please indicate your level of support for the new coastal defences

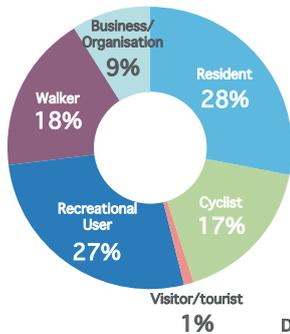


"The information presented today has helped my understanding of the new coastal defences being built along Eastern Road and Kendall's Wharf"

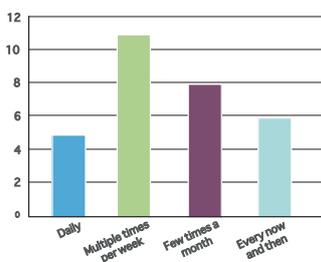


Questionnaire Results

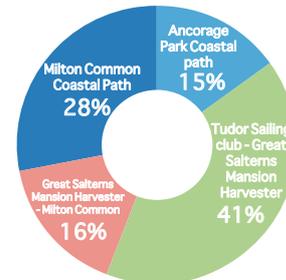
What is your interest in the new coastal defences?



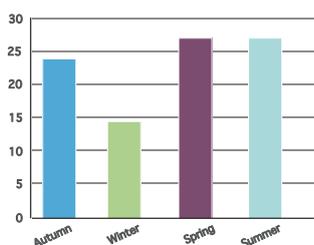
How often do you use the Eastern Road waterfront?



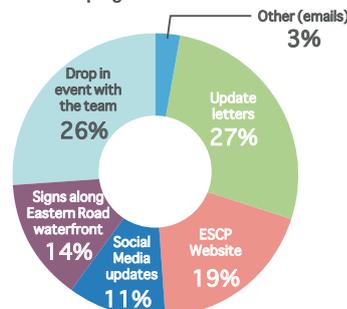
Which stretch of the Eastern Road waterfront do you use most regularly?



During which times of the year do you most regularly make use of the Eastern Road waterfront?



How would you like to be kept informed about the progress of the scheme?



Phase 4: Eastern Road and Kendall's Wharf

The Eastern Road and Kendall's Wharf coastline represents the fourth phase of construction of new coastal flood defence as part of the North Portsea Island Coastal Defence Scheme.

This phase has two distinct sections: Kendall's Wharf and Eastern Road. The full length of the frontage is 2.4km (300m for Kendall's Wharf and 2.1 km for Eastern Road). The work will cost approximately £14million and will take an estimated 6 months to complete at Kendall's Wharf, which will be followed by an estimated 3 years to complete seawall construction along the Eastern Road. Reinstatement, including planting and light landscaping works will continue after completion of the seawall.

The new defences are designed to significantly reduce the risk of coastal flooding over the next 100 years. On completion the scheme will offer protection against a 1 in 500 year coastal flood event, which is one of the highest standards of flood protection outside of London.

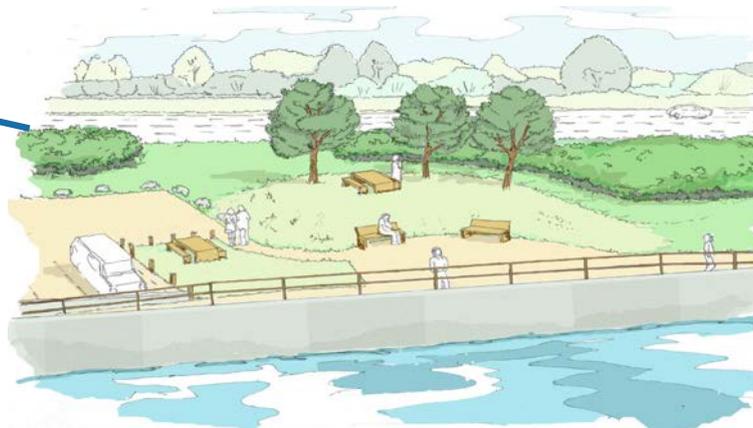
The design of the defences have been developed in collaboration with key stakeholders, including landowners, leaseholders and environmental and heritage advisors. It also includes ideas and aspirations received from the public during the option selection and consultation events held in 2014.



Scheme extent
Aerial Photography (2013); Image courtesy of Channel Coastal Observatory



Artist's impression - view from Tudor Sailing Club



Artist's impression - view of Great Salterns Quay car park

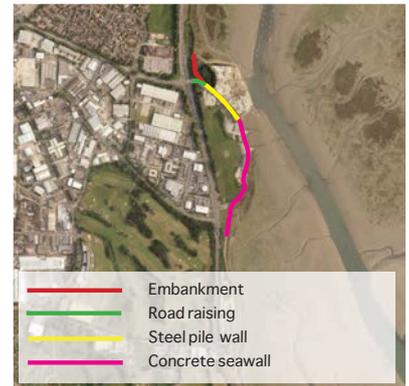
- Kendall's Wharf : Construction begins winter 2019. Reopens spring 2020.
- Eastern Road : Construction begins spring 2020. Whole site will be closed for the duration of the work and opened in sections once completed. Current indications estimate the work will take 3 summers.

What will the defences look like?

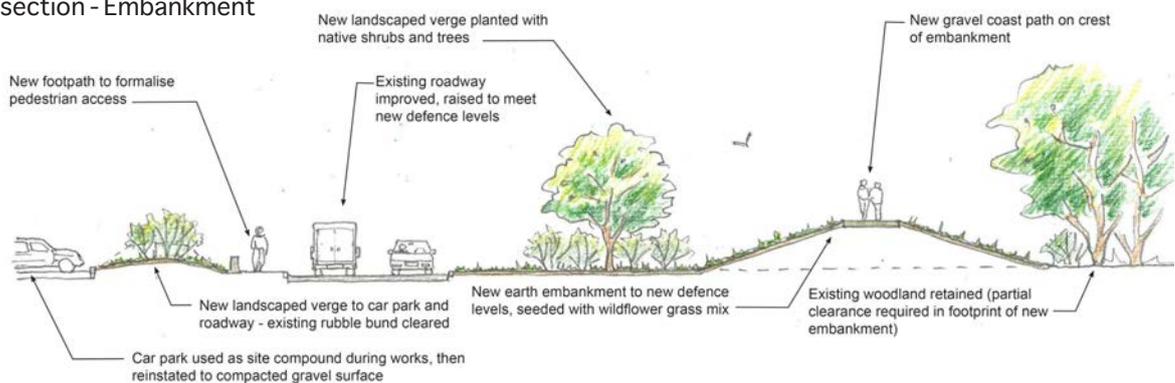
Kendall's Wharf

Embankment

The first circa 150m of sea defence will be a raised earth embankment with a continuation of the 3m wide coastal path. This embankment will tie into the area of road raising landward of Kendall's Wharf, where the road will be raised by approximately 1m. The new defences will tie in with those built at Anchorage Park in 2016.



Illustrative cross section - Embankment

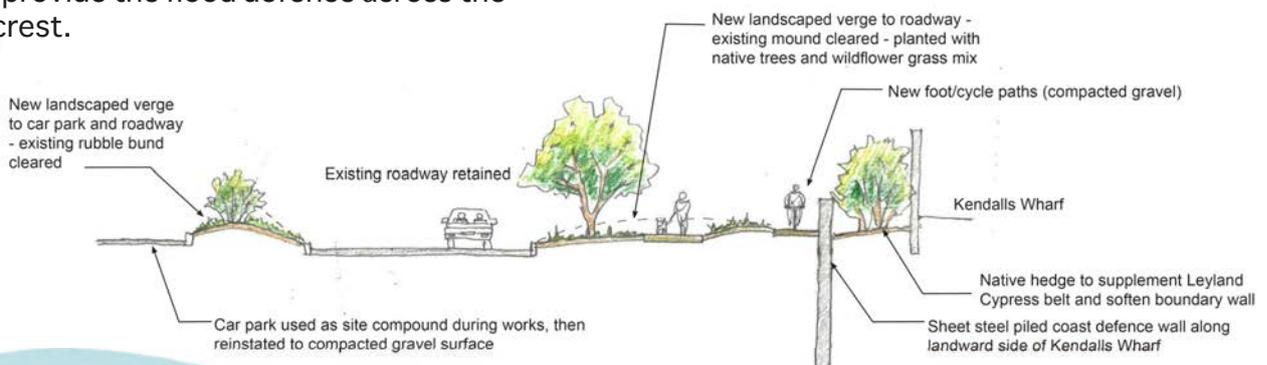


Steel pile wall

South of the road will be 150m of steel sheet pile wall and will tie into the coastal defences at Eastern Road.

Slipways

The slipways at the Tudor Sailing Club and the Watersports Centre will be improved as part of the scheme. The seaward ramp will be upgraded and be no steeper than the steepest part of the existing slipway. It will be possible to access the slipway from the sides in all states of the tide. The width will be increased where possible and a flood gate will provide the flood defence across the slipway crest.



Illustrative cross section - Steel Piled Wall

Eastern Road Enhancements

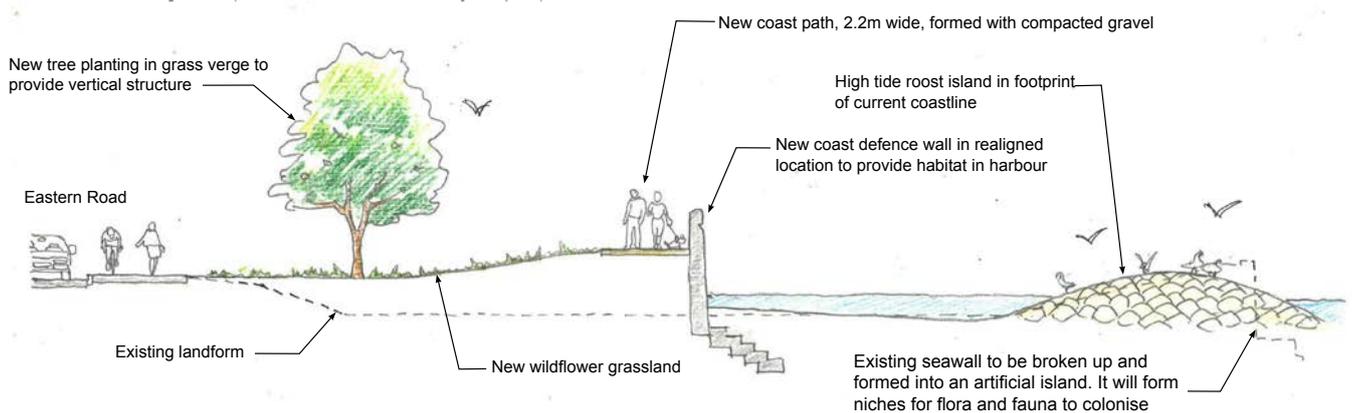
In the northern section, the existing seawall will be encased and the existing path behind the seawall reconstructed.

In the Southern section, a vertical reinforced concrete wall with a stepped revetment will be constructed. The sea defence will stand 1.2 m above the new path level along the stretch of the frontage. Extra seating, viewing areas and planting will also be introduced to the frontage.



The existing path is in poor condition. The new path will be a minimum width of 2m which will connect to Anchorage Park coastal path in the north and Miton Common coastal path in the south. Due to space constraints, the path will be realigned behind the Outdoor Activities Centre and the Tudor Sailing Club to enable the continuation of a wide and safer pathway.

South of Great Salterns Quay car park - Bird Island



A bird island will be introduced to provide a high tide roosting site for Special Protected Area (SPA) bird species. There are few sites in the Solent region suitable for high tide roosting that are undisturbed by dogs. This makes it very difficult for roosting birds to conserve energy required for their lengthy migrations. Here, the new seawall will shield the birds' views of dogs allowing them to roost undisturbed, providing a refuge at high tide.

Landscaping

Landscaping works will be carried out to enhance this much loved coastal region and will include new access points to a public footpath, as well as reconstruction of 2 slipways and egress steps along the frontage.



Environmental Enhancements

In addition to reducing the flood risk for North Portsea, this work is a prime opportunity to introduce environmental enhancements to the area.

Texturing - Greening the Grey

Using the texture of the seawall as an opportunity to encourage marine growth and habitation, we are using science-based designs that prove to enhance marine biodiversity. We are working with Glasgow and Bournemouth Universities, who are renowned experts in this field, to develop the design for texturing the seawall. Introducing different textures to the seawall provides pockets of shade and helps retain water on the seawall surface, which enables marine growth. Providing opportunities for marine habitat environment, which would otherwise be a grey concrete desert, improves the biodiversity of the area and in turn, the water body.

This will be the first intertidal textured seawall for marine habitat creation in the UK which we are hoping will set the standard for future seawall constructions both nationally and internationally.



Tidal pools

Small tide pools will be introduced into the base of the seawall, which will offer a simple and resourceful solution that will encourage marine growth and habitation of marinelife, such as anemones, crabs, small fish, cockles and worms. These pools will form part of the steps of the new defences.



Tangier Road realignment

At Tangier Road, the seawall alignment will be pushed seaward by 2m in order to accommodate a suitably wide footpath, providing a safer distance between the path and Eastern Road.

In addition to the mudflat creation at Great Salterns Quay, the defence line is being further realigned landward to compensate for the habitat loss from the scheme, creating an additional 1161m² of mudflat.

Keeping encroachment into the harbour and reducing loss of environmentally designated habitat is a primary objective of the North Portsea Island Scheme.



Bird Island

An offshore bird island will be built close to the shore to create a high tide roosting site for Special Protected Area (SPA) bird species including Dunlin, Redshank, Black-tailed Godwit. The island will also

have the potential to provide suitable nesting opportunities for seabirds including Terns. The seawall will create a barrier between the birds and the dogs walking on the path, allowing them to roost undisturbed.



Environmental Considerations

Langstone Harbour and the surrounding land supports a large variety of wildlife and habitats, the majority of which are protected at an international level.

Environmental designations

Internationally important populations of rare wildfowl and wading birds visit Langstone Harbour during the winter. The harbour contains areas of saltmarsh, mudflat and eelgrass habitats that support these bird species alongside fish and marine mammals (including common and grey seals).

These habitats are internationally protected and the harbour is environmentally designated as a:

- Wetland of International Importance (Ramsar Convention).
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)

Ecological surveys

We have completed specialist habitat surveys to confirm which species could be impacted by the works and produced a mitigation plan that will guide the construction works and minimise impacts.

Our surveys and reporting include:

- Phase 1 and Phase 2 Habitat Surveys
- An Environmental Statement
- A Habitat Regulations Assessment
- A Water Framework Directive Assessment

These ecological surveys have been undertaken by ecological experts and advice sought from Natural England, the Environment Agency, the RSPB, Langstone Harbour Board, the Wildlife Trust and Hampshire County Council's ecology team.

Mitigation

A Construction Environmental Management Plan will be written in conjunction with the appointed contractor to reduce and manage any environmental impacts during construction.

Long term, the local environment is expected to become more interesting and diverse following landscaping works.



When will the work happen?

Construction programme

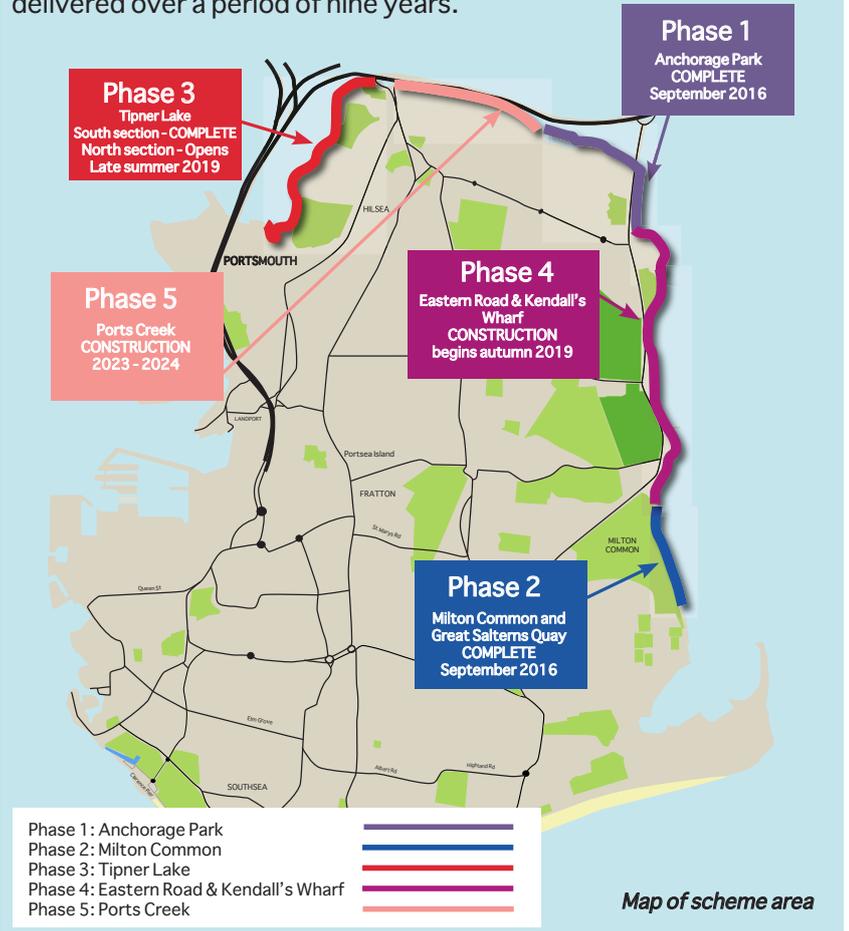
Subject to final approval of all relevant licences and consents, construction is programmed to start autumn 2019 for the works to the road at Kendall's Wharf, off the Eastern Road.

Construction of the seawall is expected to commence spring 2020. The seawall construction is currently estimated to take three summers.

No construction works are due to take place over the winter period on the Eastern Road, due to environmental restrictions, however soft landscaping works will be undertaken during this time. The coastal path will be closed for the duration of the works and sections will reopen as works are completed.

North Portsea Island Construction Phasing

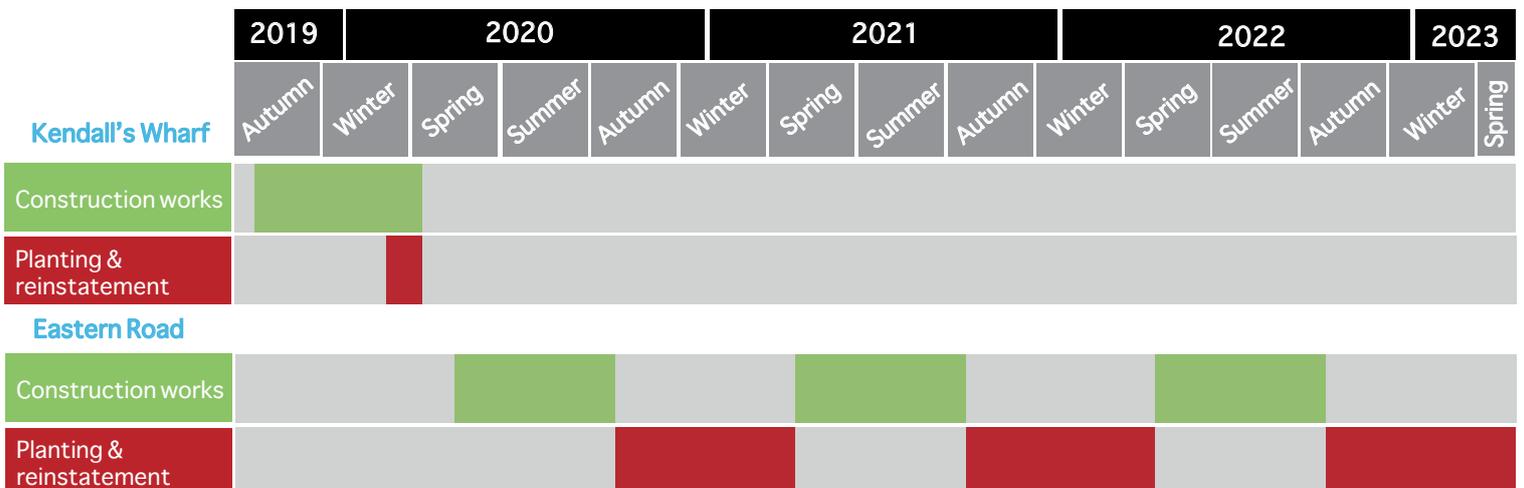
Construction work has been split into distinct phases which will be delivered over a period of nine years.



- Kendall's Wharf: Construction begins autumn 2019. Road closed from summer 2019 - spring 2020.
- Construction begins spring 2020. Completes autumn 2020.
- Construction begins spring 2020. Whole site closed for duration of the work and opened in sections once completed. Current indications estimate the work will take three summers.

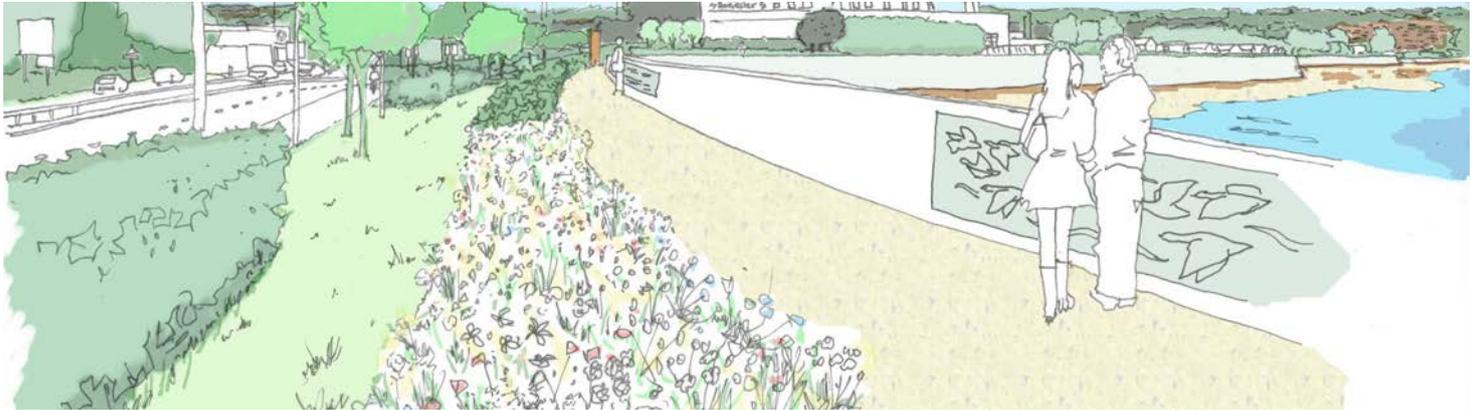


Estimated programme of works



Landscaping and Replanting

On completion all working areas will be reinstated to their former condition. There will also be an extensive landscaping and replanting programme using specially selected plant species.



Replanting

We have worked with experts to better understand the environmental features of the area and ensure the most appropriate species are selected.

Areas cleared of vegetation will be replanted with a range of specially chosen species. These include a mixture of grasses, trees, shrub and species rich meadow.

The new plants will be more visually and ecologically diverse than what was there previously, creating a better habitat for local wildlife.

Whilst the replanting programme is extensive, it will naturally take some months to fully establish.

Example species

The species being planted include:

Trees



- ← Ornamental Cherry
- Field Maple
- White Willow
- Holm Oak →



Shrubs



- Wayfaring Tree
- Elder
- ← Dog Rose
- Blackthorn →



Image © Luc Viatour

Image © Kristian Peters

Grasses and wildflowers



- ← Common Poppy
- ← Oxeye Daisy →
- Goatsbeard
- Golden Oats



Earth Bund

A sloped embankment or bund constructed from earth designed to withhold water and prevent flooding.



Revetment

A protective structure normally placed on an embankment to absorb wave energy and to provide protection against erosion.



Setback Floodwall

A new floodwall setback from the existing defence.



Flood Gate

A watertight gate left open during normal conditions, but can be closed to form a flood defence when required.



Rock Toe

Low structures of rock placed along the water's edge of a shoreline. The rock helps to absorb wave energy.



Sheet Pile

Vertical steel sheets driven into the ground in place of, or as part of the new defences.



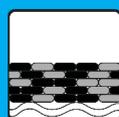
Gabions

A basket or cage filled with rocks and often stacked to create a wall.



Bagwork

A structure, consisting of heavy material sewn into bags, for protecting embankments against erosion.



Stepped Revetment

Same as a revetment, with extra ability to break up wave energy, stepped beach access and more use on open coast.



Beach Recharge

Material is sourced from outside the normal beach sediment system and introduced nearshore.



Beach Recycling

Material is sourced from downdrift and returned to the nourished beach.



Groynes

A low wall built out from the coast into the sea, to prevent the repeated movement of the waves from removing beach material.



Demountable Defence

A particular form of temporary defence with permanent fixings but with a temporary flood barrier that can be demounted.



Rock Armour

Large boulders used to reduce wave energy reaching the shoreline.



What Can We Expect?

Key Dates...

**Zone 1 -
September 2019**
Work starting at Kendall's
Wharf

**Zone 2 -
April 2020**
Work starting on Eastern
Road

Previous NPI Schemes...

Phase 1 - Anchorage Park 2015



Phase 2 - Milton Common 2016



Phase 3 - Tipner Lake 2017 Present



How will I be affected?

As the construction works will be undertaken over a period of three years (Sept 19 - end Sept 2022), they will be delivered in a phased approach to minimise disruption to the local community and ensure access is maintained where possible.

Working Hours

Normal site working hours will be 7:00 - 19:00 Monday to Fridays in order to reduce disturbance to residents caused by noise and vibration from construction work and machinery.

Due to the tidal nature of the works, it will be necessary to work some weekends and nights, to maximize tidal working windows.

Night works will not be permitted within 200m of a residential dwelling (including caravans).

Road Access

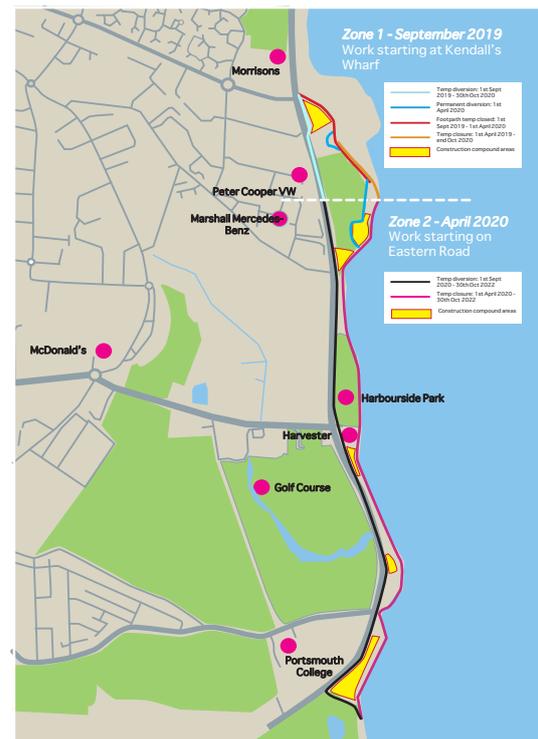
Temporary access roads will be installed prior to closing the road at Kendall's Wharf to maintain access to businesses such as Tudor Sailing Club and the Andrew Simpson Watersports Centre.

Access will be maintained to all businesses throughout the works, and all businesses will be open as usual.

Site Operation

Construction work will be undertaken by a contractor who has proven experience in the delivery of coastal defence schemes. Proactive site management will ensure disruption as a result of construction activities is minimised wherever possible.

Construction Site and Access



The construction site will be set up to ensure public safety and allow the work to progress in a safe, efficient and controlled environment.

Site set up will begin in September 2019 for Zone 1, Kendall's Wharf works.

Why are you doing this?

To reduce the risk of flooding from the sea over the next 100 years to over 4,000 homes, nearly 500 businesses and the transport network.

What will it look like?

The design at the Eastern Road is similar to the seawall design at Tipner Lake. The wall will stand 1.2m above the new path level along the length of the frontage. The new path will be a minimum width of 2m which will connect to Milton Common coastal paths in the south and Anchorage Park coastal paths in the north. Extra seating and viewing areas as well as planting will also be introduced to the frontage to improve the area.

Will I still be able to use the footpath during construction?

In order to build the defences safely, the area will need to be closed to public. This will include closing the footpath between Milton Common and Anchorage Park for the duration of the work. The footpath along the Eastern Road will remain open for the duration of the work.

How long will it take?

Construction on the road at Kendall's Wharf, off the Eastern Road, are scheduled to begin in Autumn 2019. This work is anticipated to take 6 months, with construction of the seawall expected to commence Spring 2020. The seawall construction is programmed to take three summers, with completion of the construction works expected in Autumn 2022 and the associated landscaping planting works in Spring 2023.

Why are we having a vertical wall?

During early option appraisal stages of any scheme, a long list of options is developed which is then whittled down. The list includes all feasible options and then eliminated based upon their technical/financial/social credentials. Back in 2014 we undertook a series of public consultations. At these events we presented the five shortlisted options. The preferred options were generally raised earth embankments, but along the Eastern Road this is not possible due to the environmentally protected harbour on one side and the Eastern Road on the other. Therefore, a new vertical defence was the only feasible option to take to detailed design and this is what has been designed for the Tipner Lake and Eastern Road frontages.

What is a 1 in 500 year Standard of Protection (SoP)?

The scheme has been designed to provide flood protection against a storm that has the likelihood to occur once in every 500 years (a probability of 0.2% chance of a flood event occurring at one point in time). A 1 in 500 year standard of protection is protecting against severe flooding, providing the highest SoP in the UK, outside of London.

Probability per year	Percentage per year
1 in 500	0.2%
1 in 200	0.5%
1 in 100	1%
1 in 50	2%
1 in 10	10%
1 in 2	50%

Standard of Protection examples

Will we still be able to see the sea?

The maximum height of the wall, above the shared cycle and foot path will be 1.2m, therefore maintaining the sea view. Furthermore, there will be areas where the ground level rises to the top of the wall, with the use of handrails as protection, which will provide an improved view.

Can we have a glass flood wall in front of the Harbourside Caravan Park?

We have been investigating the costs of installation and maintenance for the next 100 years of flood glass over the 300m stretch in front of the caravan park. We are looking into the technical aspect also to ensure it is appropriate to maintain the glass in the harbour environment. Once this has been done, we will have a better understanding whether we can install and maintain the flood glass in this location, along with how this additional cost will be funded.

Working together - protecting our coastline

Find out more



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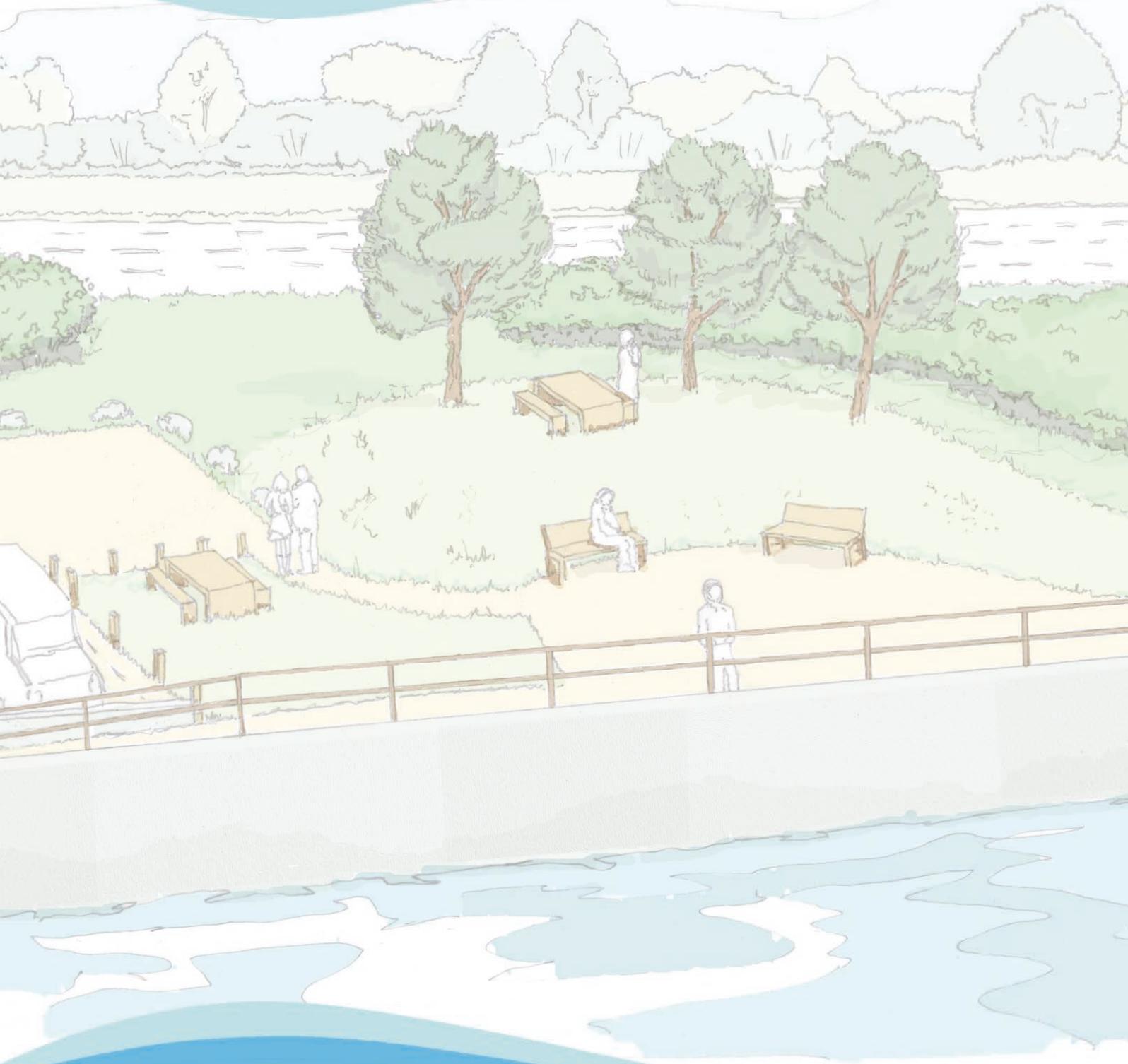


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