Coastal Partners

Portsmouth CITY COUNCIL

North Portsea Island Exhibition Booklet

2022

Contents

Climate Change and Sea Level Rise

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.

Flooding at Eastern Road during Storm 2014

Flooding at Tipner Lake before new coastal defences completed

Rising sea levels

Relative sea level rise refers to the effective change in sea level relative to land surface and takes into 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.

Flooding at Southsea bandstand

Extent and Risk of Flooding

Present Day

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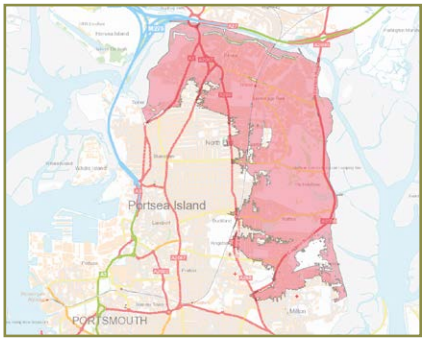


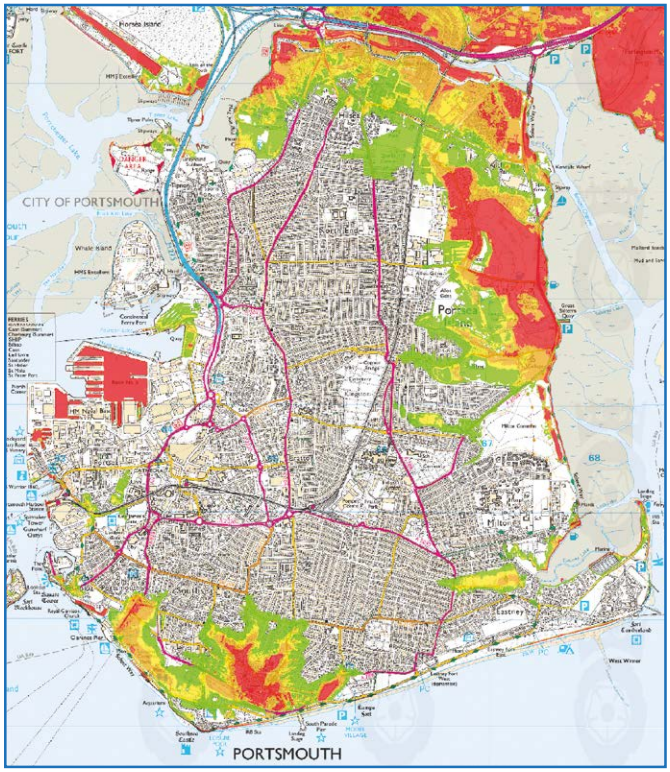
1,414 residential and 147 commercial properties are currently at risk from a 1 in 200 year tidal flood event. This increases to 4,234 residential and 490 commercial properties over the next 100 years.

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 indicate 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 *'Strategic Flood Risk Assesment map set 1B'* (PCC Strategic Flood Risk Assessment, portsmouth.gov.uk)

Classification	Description
Low	Caution Flood zone with shallow flowing water of 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

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 2.1km for Eastern Road). The work for this phase is estimated to cost a total of £21m. Kendall's Wharf was completed in 2020, and the remainder of the work along Eastern Road are currently planned to be completed in 2023. Reinstatement, including planting and light landscaping work 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 in the UK outside of London.

The design of the defences has 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.

Overview Map

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


Kendall's Wharf completed path


Eastern Road social spot visual

Kendall's Wharf : Complete

Eastern Road : To be completed in 2023

Environmental Enhancements

Enhanced Footpath

As part of the scheme, there will be a new, improved, path, replacing the existing one that 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 Milton Common coastal path in the south.

It will be finished with Breedon gravel, as seen on the completed area at Kendall's Wharf. The path will have a nice even surface, suitable for cyclists, pedestrians, wheelchairs and pushchairs.

Breedon gravel at Kendall's Wharf

Early stages of habitat growth, with sights of snails moving in already

Eco-enhanced Wall

A textured surface in the intertidal zone to help ecological growth.

This textured wall will:

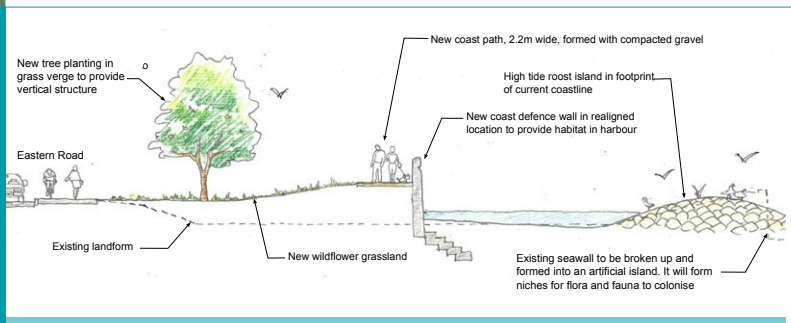
- Improve the environment in the area by encouraging the establishment of species already found in Langstone Harbour;
- Provide refuge for animals and plants from waves, predators and dryness;
- The pockets provide water retention and shade to encourage green growth;

Habitat will take years to establish, but once established will further protect the wall by:

- Absorbing wave energy;
- Reducing temperature and salt fluctuations.

Bird Island

A bird island will be delivered as part of the scheme to provide a high tide roosting site for Special Protected Area (SPA) bird species. There are only a few sites in the Solent region suitable for high tide roosting that are undisturbed by dogs, of which this will be one of them. 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.



Sketch of Bird Island

Bee Posts

A mixture of concrete and timber posts will be used and monitored

Tidal Pools

An example of tidal pools used at the Tipner Lake scheme

Wildflowers

Wildflowers at Kendall's Wharf

Native Trees

Native trees planted at Kendall's Wharf

Information Signs

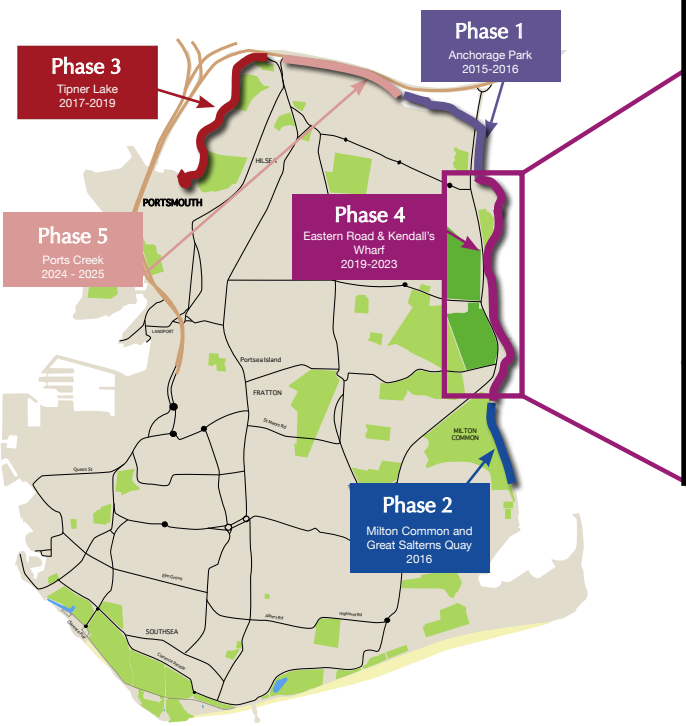
An example of signage from completed phase at Tipner Lake

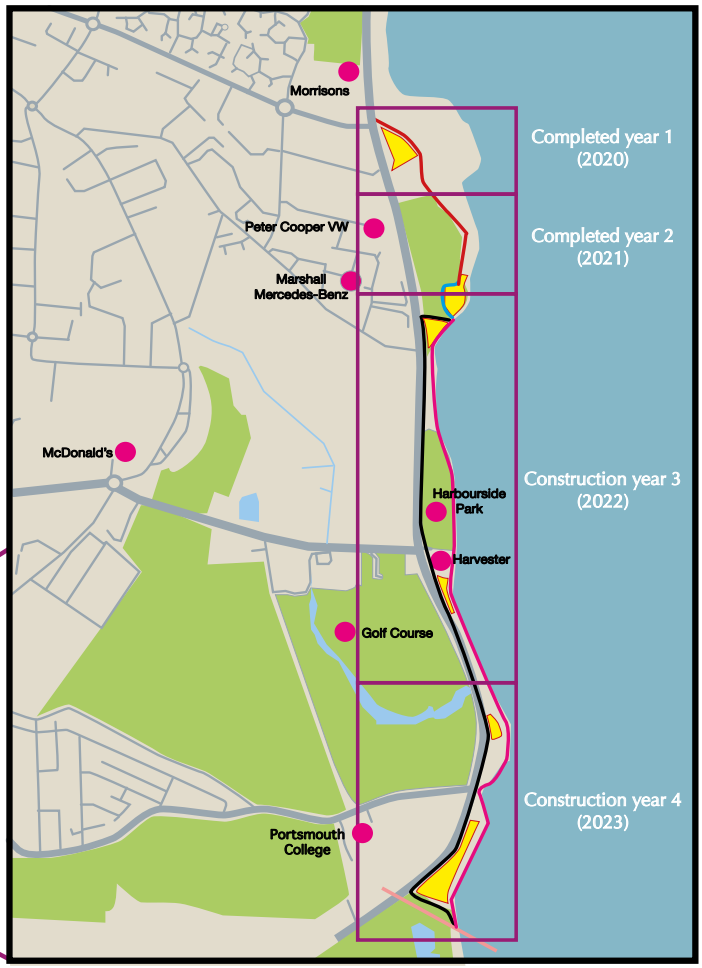
When Will The Work Happen?

Construction on Phase 4 started in autumn 2019 and is planned to take four years in total (see map right).
Due to overwintering birds we cannot carry out construction work that might disturb the birds between October and March, however some landscaping work will still happen during these winter breaks.

This year (2022) we will be building the next stage of defences at the Harbourside Park and the Harvester.
The work at Harbourside park will be carried out in 5 key stages:

- Piling
- Bases and lower walls
- Upper walls
- Glass flood wall
- Landscaping (paths, fencing and landscaping)

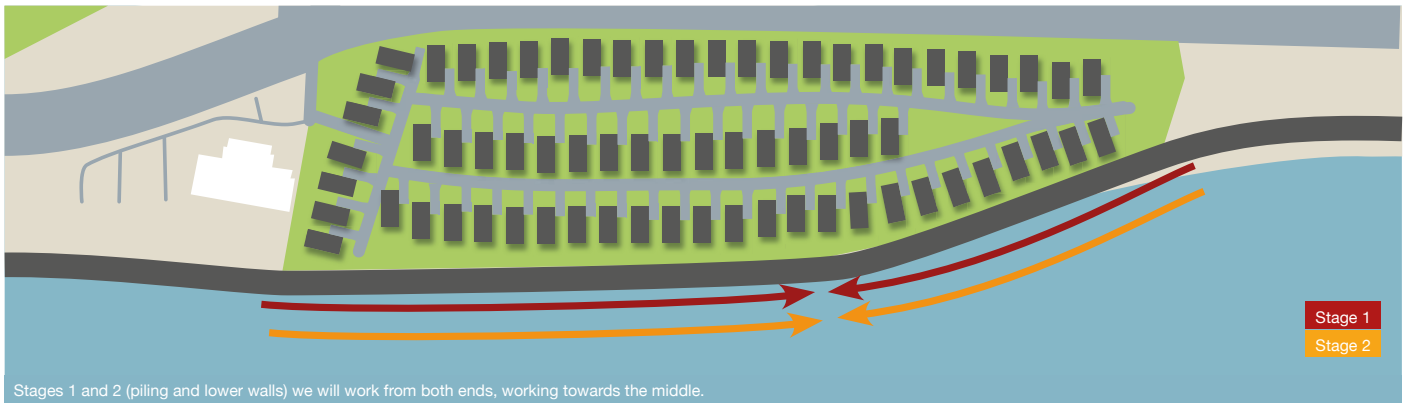




Estimated programme of work for Harbourside Park – 2022

Eastern Road	2022					
	April	May	June	July	August	September
Stage 1: Piling						
Stage 2: Bases and lower walls						
Stage 3: Upper walls						
Stage 4: Glass flood wall						
Stage 5: Finishing (path, fencing and landscaping)						

Stages of Work - Stages 1 & 2

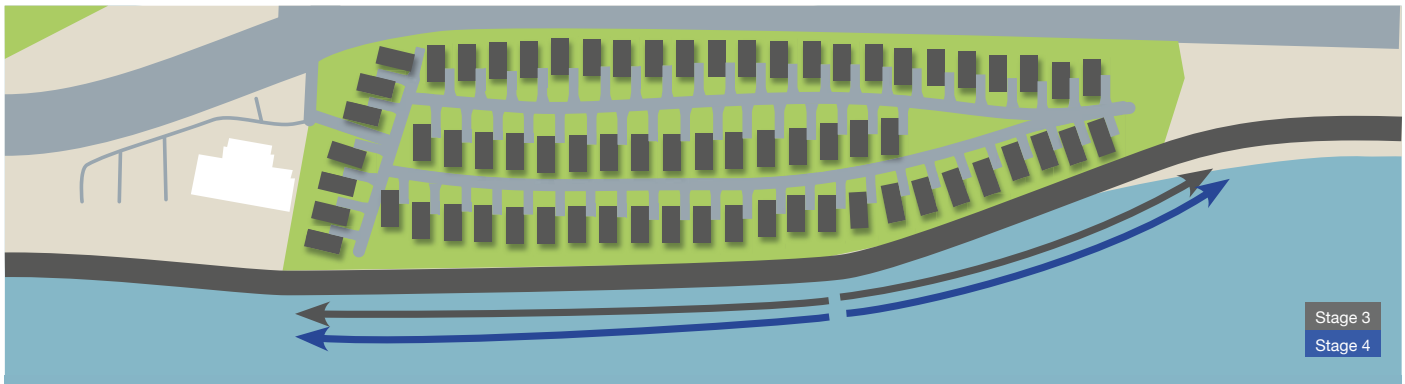


Stages 1 and 2 (piling and lower walls) we will work from both ends, working towards the middle.

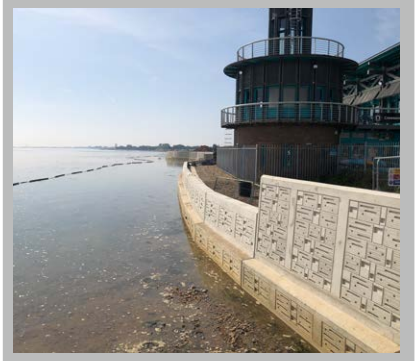
Stage 1		Construction activity	How might this affect me?
Piling		The first stage to build the new wall is to install a so-called sheet pile wall, where long steel piles are driven deep into the ground to provide structural support from the sea for the new wall. Prior to piling an 8-tonne mini digger will dig a trench in the foreshore to the level of later concrete work. This is done before the piles are installed as it would be harder to dig around the piles once installed. The sheet piles are then driven into the ground using a Movax piling rig mounted to an excavator (see image). The rig holds the pile in the right position whilst creating the vibration to drive the pile into the ground.	This is likely to be the noisiest part of our work, so we will ensure to keep you updated on exact timings as we go along. Levels of noise and vibration will be monitored by a specialist independent consultant (Acoustic Associates). There are set "action-levels" below the official limits set by Portsmouth City Council. Monitors are programmed to automatically send a text message to site management should the action level be reached to intervene before the limits are met. We are looking for volunteers to keep monitors on their property (close to the work). If you're interested in supporting monitoring, please leave your contact details with a member of the team.

Stage 2		Construction activity	How might this affect me?
Bases and lower walls	  	At first so-called "blinding" concrete will be poured into the trench between pile sheets and wall to form a layer of concrete to work from. Once the first layer has set we will be creating the base for the wall. Before the concrete is poured, a metal cage (called rebar cage) is constructed and installed to connect and strengthen the inside of both, base and wall. Finally once the base has been poured and dried, the eco-formliner moulds will be attached and secured on both sides and concrete is poured in between forming the lower part of the sea defence wall. (Metal shutters are used to hold the moulds in place.) The concrete will be delivered by lorry, which will reverse up the access road. The walls are formed in sections called bays "hit and miss" – meaning we will build one section, then miss one, build one, then go back to fill in the gap once the concrete either side has set.	This part of construction will create some noise and dust. However there will be mitigation measures in place such as damping down the haul route, low vehicle travelling speed etc. Working hours will be restricted to daytime to limit disruption and working hours within 100m of any (holiday) home will be restricted to 07:00 am - 7:00 pm.

Stages of Work - Stages 3 & 4

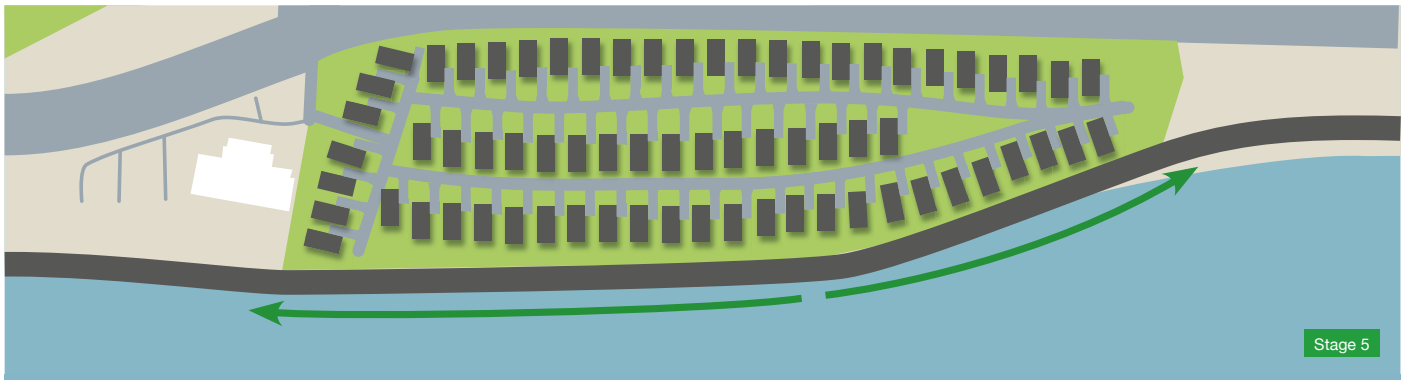


Stages 3, 4 and 5 (upper walls, glass flood wall and landscaping) we will work from the middle outwards to "work our way out" as with the upper walls in place there is less space for equipment.

Stage 3		Construction activity	How might this affect me?
Upper walls	 Upper wall at Andrew Simpson Centre before the glass flood wall was mounted on top (of the lower section)	Once bases and lower walls are set, the upper walls will be poured. For the upper walls the technique is the same as lower wall and base, including rebar cage and eco-formliner, but with a slightly different, narrower shape. The concrete for the upper walls will also will be delivered by lorry and walls will be formed in sections, leaving a gap until the concrete has set either side to then return and connect the sections by 'filling the gap'.	This part of construction will create some noise and dust. However there will be mitigation measures in place such as damping down the haul route, low vehicle travelling speed etc. Working hours will be restricted to daytime to limit disruption and working hours within 100m of any (holiday) home will be restricted to 07:00 am - 7:00 pm.

Stage 4		Construction activity	How might this affect me?
Glass flood wall	 	For the glass flood wall the upper concrete wall is built to a lower height and upright aluminum posts are bolted to bases cast into the wall. Then the glass panels will be slotted in between two posts on top of the prepared wall. This is intricate work considering the scale - as the panels need to be accurately and precisely in place (within 3mm of the specification) for the glass panels to fit. A specialist team from the glass flood wall manufacturer will deliver the pre-constructed panels to site and fit and secure them into place using a small truck-mounted crane with a vacuum lifter. 	For this stage of work disruption will be minimal, some potential noise might be heard from the crane truck used to lift the panels into place.

Stages of Work - Stage 5



Stages 3, 4 and 5 (upper walls, glass flood wall and landscaping) we will work from the middle outwards to "work our way out" as with the upper walls in place there is less space for equipment.

Stage 5		Construction activity	How might this affect me?
Landscaping, path and fencing	 Visualisation only  Example of fencing in real-life residential location  Example of Breedon gravel footpath	The final stage of work will include last landscaping work, finishing the new improved path and reinstating the fence around the park. The finished path will have a Breedon gravel surface, which will be laid using a mini-excavator, dump truck and roller. The finished fence will be 1.8m high and in black polyester powder coated steel.* To install the fence, posts will be placed using hand tools or small mechanised equipment, then the panels will be secured in place using hand tools. **final specifications of fencing might be subject to change*	This final stage of work will cause minimal disruption, as only small equipment and hand tools will be used.

Visualisation only

Completed work at Kendall's Wharf

The first stage at Kendall's Wharf was completed in 2020 (opened to the public in 2021 to allow time for planting to establish).

Completed work in this area included:

1. Raising of the road by 1m to provide continuous flood protection and to meet the embankment
2. Creating a wider and enhanced public footpath, which can be used by pedestrians and cyclists
3. Wildflower seeding to the area, to encourage bees and other wildlife
4. Installing a sheet pile wall defence with timber cladding with an improved footpath alongside

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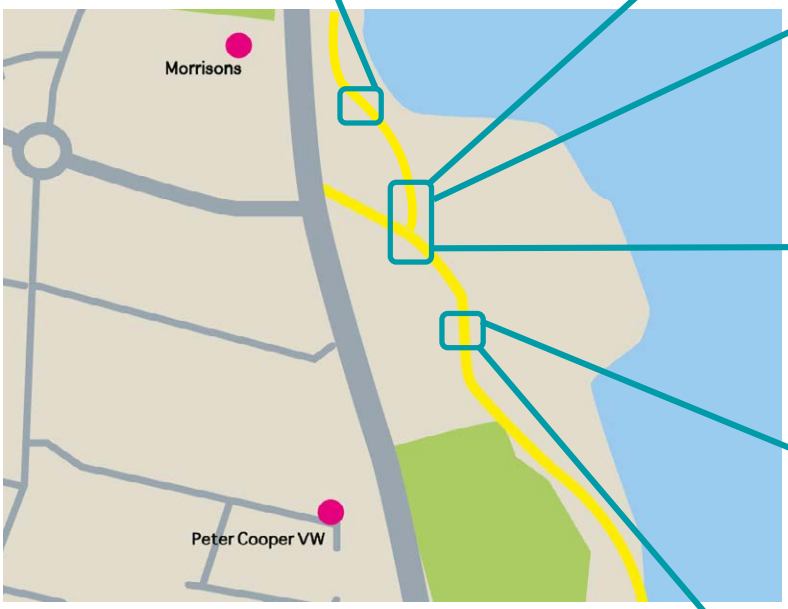

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4.

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Completed work at Eastern Road

Andrew Simpson Watersport Centre and Tudor Sailing Club

Construction at Eastern Road began in year 2 (2021) and the defence was complete up to the land just north of Harbourside Park.

Completed work in this area included:

1. Successful installation of first sections of glass flood wall at the Andrew Simpson Centre and Tudor Sailing Club
2. Construction of concrete flood defence wall with textured surface on the seaward side, to encourage marine habitats to grow. The saltmarsh habitat has been successfully protected and replanted upon completion.

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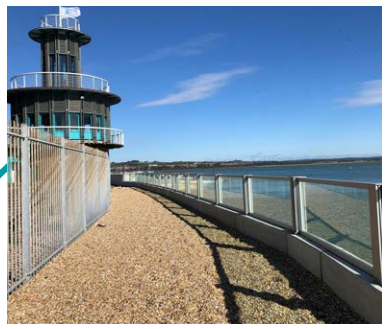

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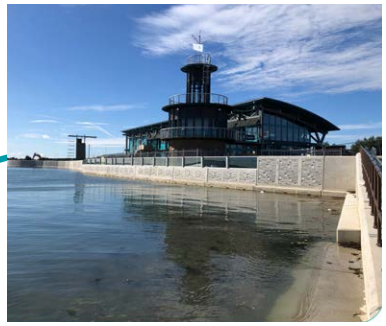

1.


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Jargon Buster

Earth Bund

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

Revetment

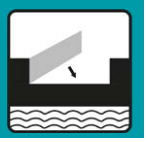
A protective structure normally placed on an embankment to absorb wave energy and to provide protection against erosion.

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.

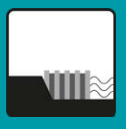


Rock Toe

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

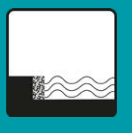
Sheet Pile

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



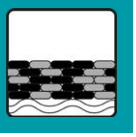
Gabions

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.

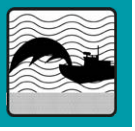


Stepped Revetment

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

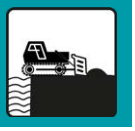
Beach Recharge

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.

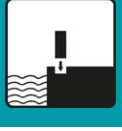


Groynes

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 is 1 in 100 year Standard of Protection (SoP)?

The scheme has been designed to provide flood protection against a storm that has a likelihood of occurring once in every 100 years (a 1% chance of a flood event occurring at any one point in time) A 1 in 100 year standard of protection is protecting against severe flooding.

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%

Coastal Partners

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