GOSPORT
Borough Council

Gosport Coastal Defence Schemes Design Update

Protecting Gosport from Coastal Flooding

Working together – protecting our coastline

Environment Agency

MOTT MACDONALD

EASTERN SOLENT | COASTAL PARTNERSHIP

Contents

FAREHAM BOROUGH COUNCIL · GOSPORT Borough Council · Portsmouth CITY COUNCIL · Havant BOROUGH COUNCIL

Who are the ESCP?

Eastern Solent Coastal Partnership

Map of ESCP coverage

The ESCP are a team of council officers delivering comprehensive coastal management services across the coastlines of Fareham, Gosport, Havant and Portsmouth.

Partnership Vision:

"To reduce the risk of coastal flooding and erosion to our communities and encourage the provision of technically, environmentally and economically sustainable coastal defence and protection measures."

The ESCP has been recognised as an example of best practice by the Environment Agency and Defra, with suggestions that the model should be encouraged across the rest of the country.

Above left: Anchorage Park Coastal Defences with Wildflower Meadow. Above right: Tipner Lake Coastal Path with Paving and Giant Sun loungers. Below: Hill Head Coastal Defence Wall with Safety Rail.

The ESCP undertakes a broad range of coastal management activities, including:

- Setting coastal management policy, through the development of Shoreline Management Plans and Coastal Strategies
- Designing and implementing civil engineering schemes
- Regular management, inspection and maintenance of sea defences
- Identifying opportunities to enhance our coastal environment
- Leading and contributing to industry research
- Engaging with local communities, organisations and businesses on all aspects of our work

These different activities are distributed across three teams:

- Coastal Policy, Strategy and Environment
- Capital Projects
- Operations

Since 2012 we have been delivering projects to the highest standard, reducing coastal flood and erosion risk to thousands of homes and businesses. The Partnership has surpassed the work that each Local Authority could have achieved in isolation delivering multi-million pound projects while making a combined saving of £1.8 million.

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

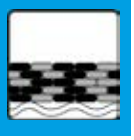
Vertical steel sheets driven into the ground in place of, or as part of the new defences.

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

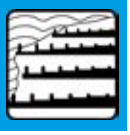
Material is sourced from outside the normal beach sediment system and introduced nearshore.

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%

The Story So Far Part 1

GOSPORT Borough Council

Policy and Strategy

Shoreline Management Plan

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

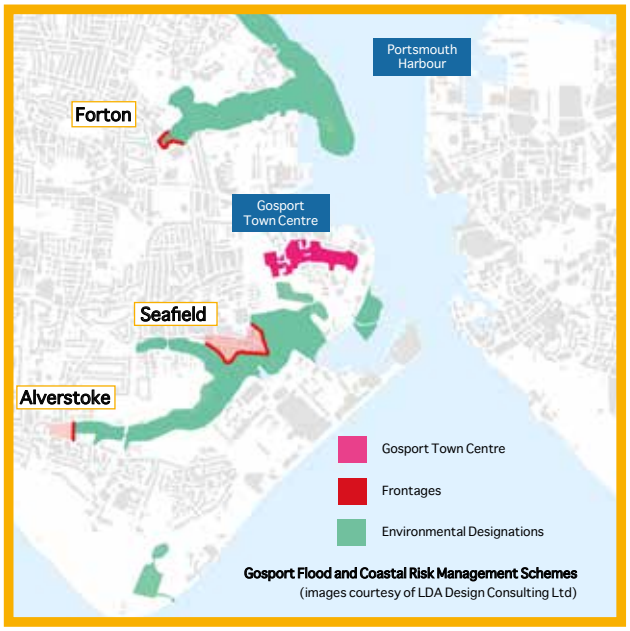
The SMP makes recommendations on how the coastline should be managed over the next 100 years. It was adopted by Gosport Borough Council in 2010 and recommends a 'Hold the line' policy to maintain or upgrade the level of protection provided by the coastal defences in this area.

The River Hamble to Portchester Strategy

A strategy looks at how the SMP policy can be implemented at a more local level and identifies areas where work may be required over the next 100 years.

The River Hamble to Portchester Strategy covers a 58km (36 mile) stretch of coastline between Burridge on the east bank of the River Hamble and Portchester Castle (in Portsmouth Harbour). This coastal frontage is highly varied and ranges from very sheltered estuarine and creek environments to much more exposed open coast beach environments.

The Schemes



Gosport Flood and Coastal Risk Management Schemes
(images courtesy of LDA Design Consulting Ltd)

	Time Horizons		
	2015-2030	2030-2060	2060-2115
Residential properties (flood risk)	415	809	2185
Commercial properties (flood risk)	63	95	237
Total properties at risk of flooding	478	904	2422
Total properties at risk of erosion (Residential and Commercial)	105	219	464

Properties at risk of flooding and erosion over the coming century if we 'Do Nothing'.
Based on 1 in 100 year (1% annual chance) flood event.

Without implementing strategic measures to manage the risks, total damages could reach £717 million by 2115.

The strategy recommended three priority schemes in Gosport. These are situated at Forton, Seafield and Alverstoke. The strategy identified these locations as "vulnerable areas", in which there is significant risk of tidal flooding.

The Story So Far Part 2

GOSPORT Borough Council

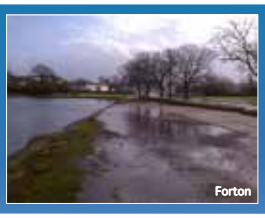
Project Timeline

GBC Propose coastal defence improvements

2016

August 2016 the Environment Agency approved funding for Gosport Borough Council to develop outline designs


Alverstoke


Forton


Seafield

Funds are used to develop to design three priority Flood and Coastal Erosion Risk Management Schemes

2017

Outline designs are proposed for each frontage


Alverstoke coastline


Seafield coastline


Forton coastline

Public consultations are held to gather opinions and ideas for further development

2018

Site investigations, surveys, environmental and heritage investigations are undertaken


LDA Design visual of Alverstoke coastline


LDA Design visual of Seafield coastline


LDA Design visual of Forton coastline

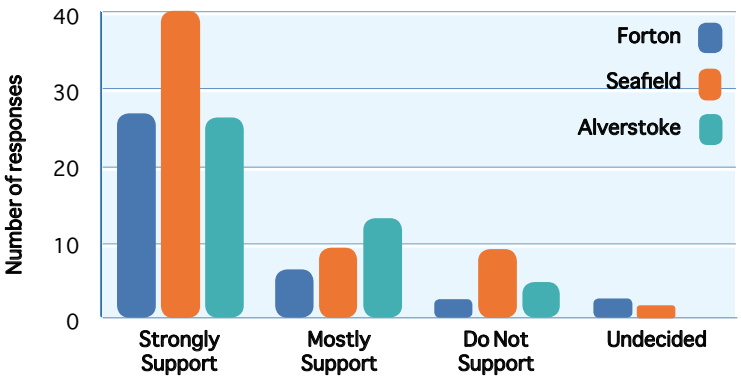
2019

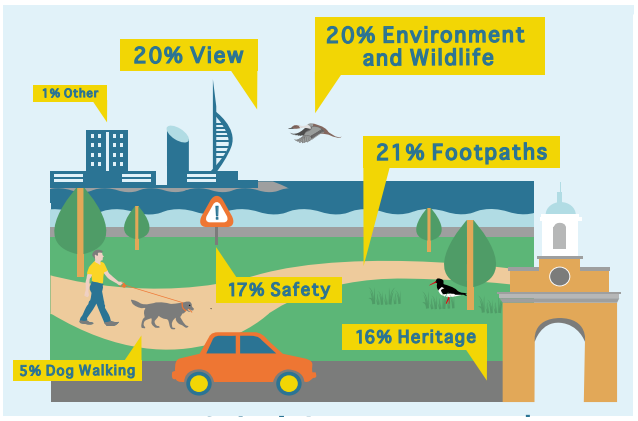
Detailed designs are being developed with environmental and heritage considerations for each frontage

September 2019

Public exhibitions were held in July 2017 at three venues local to each of the schemes. The events presented the outline design options to the public, and were an opportunity to get feedback to help inform the detailed design.

Having seen the shortlist option posters for the project frontages, to what extent do you support the option for each?





Climate Change and Sea Level Rise

GOSPORT Borough Council

Planning for the long term future of our Coastal Communities


Forton


Seafield


Alverstoke

Our Responsibility

In all our designs we have to take account of and plan for sea level rise. Scientists have determined that the temperature of central England has risen by almost 1°C over the last century. Winters are getting increased rainfall 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 acting now to protect our coastline and ensure that our actions are sustainable for future generations.

Gosport Borough Council takes human-induced climate change very seriously. Many of the services that they provide directly affect the local economy and the environment. When developing Council Strategies and how services are being delivered, the council will always consider how these things could affect climate change and how communities can respond to the effects of climate change.

Climate Change

Relative sea level rises refer to the effective change in sea level relative to the 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 level due to global warming is caused by thermal expansion of the oceans and to a lesser extent from melting of 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.

Alverstoke Flood Risk

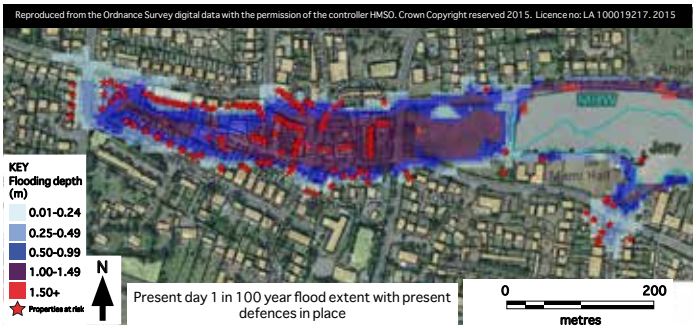
GOSPORT Borough Council

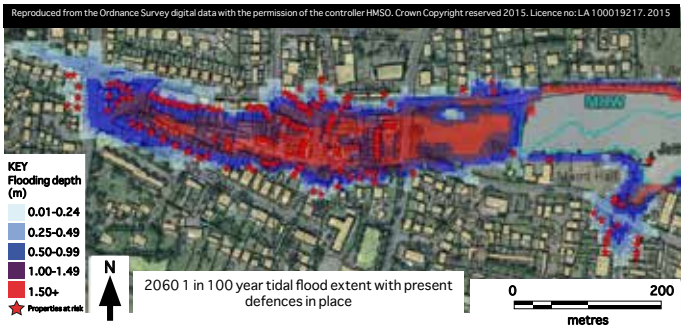
114 properties in Alverstoke are at risk from a 1 in 100 year flood event. This is expected to increase to 142 properties by the year 2060.

Number of properties at risk from a 1 in 100 year probability tidal flood event in Alverstoke

YEAR	RESIDENTIAL	COMMERCIAL	TOTAL
2015	105	9	114
2060	132	10	142
2115	252	14	266

LDA Design image of Alverstoke Landscape Plan





Properties and assets at risk from coastal flooding:

- Residential and commercial properties
- Allotments
- Approximately 30 listed buildings
- Existing recreation ground and sites of environmental importance
- A cemetery
- Critical infrastructure and extensive urban utilities and services:
  - Anglesey Road
  - 3 electricity sub-stations
  - Surface water pumping station & sewers
  - Pressure gas mains
  - Telecoms and cable networks

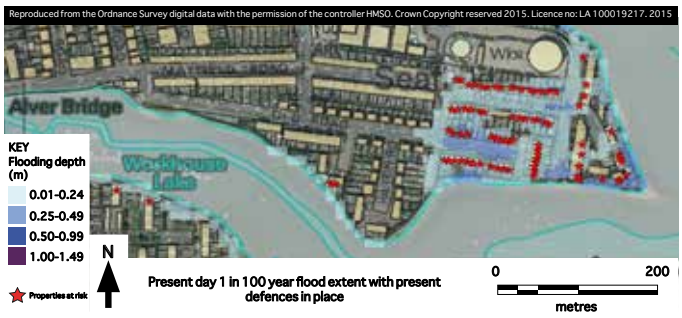
The proposed Alverstoke scheme covers approximately 100m of coastal frontage, with the tidal flood route located at the western end of Stoke Lake (between Little Anglesey Road and Clayhall Road). The flood risk area extends 550m to Jellicoe Avenue.

Seafield Flood Risk

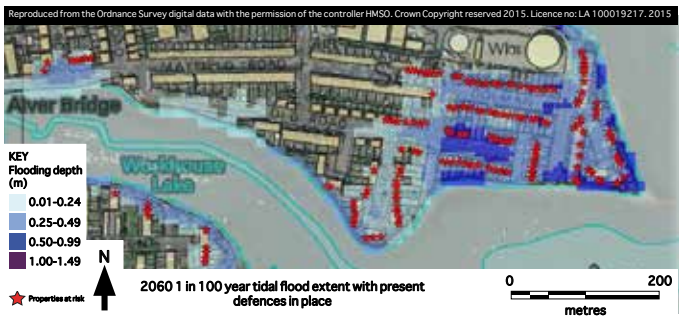
GOSPORT Borough Council

80 properties in Seafield are at present day risk from a 1 in 100 year flood event. This is expected to increase to 193 properties by the year 2060.

LDA Design image of Seafield Landscape Plan



Present day 1 in 100 year flood extent with present defences in place



2060 1 in 100 year tidal flood extent with present defences in place

YEAR	RESIDENTIAL	COMMERCIAL	TOTAL
2015	80	0	80
2060	192	1	193
2115	471	18	489

Number of properties at risk from a 1 in 100 year probability tidal flood event in Seafield

The proposed scheme covers approximately 770m of coastal frontage, with the tidal flood risk area located north of the Haslar Lake and Workhouse Lake confluence, between Old Road and Mariners Way in Gosport.

Properties and assets at risk from coastal flooding:

- The residential area of Seafield
- Access roads in and out of Seafield
- Areas of open space
- A large industrial site to the north of the tidal flood extent
- Critical infrastructure and urban utilities and services, including 3 electricity sub-stations, foul water sewers, surface water sewers, low pressure gas mains, telecoms and cable networks
- Haslar Lake and Workhouse Lake - sensitive sites that are environmentally designated

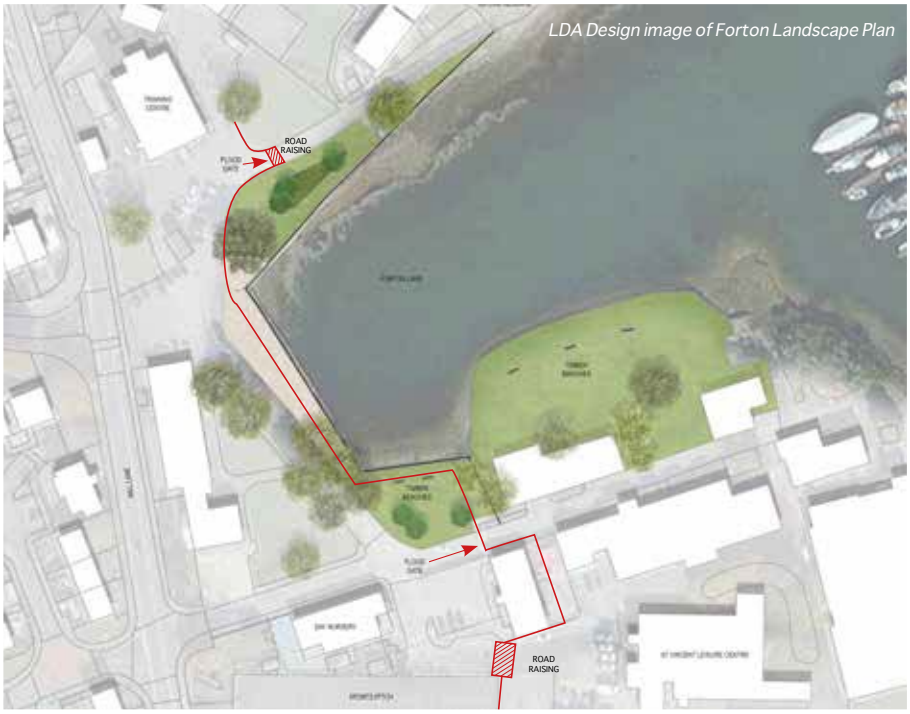
Forton Flood Risk

GOSPORT Borough Council

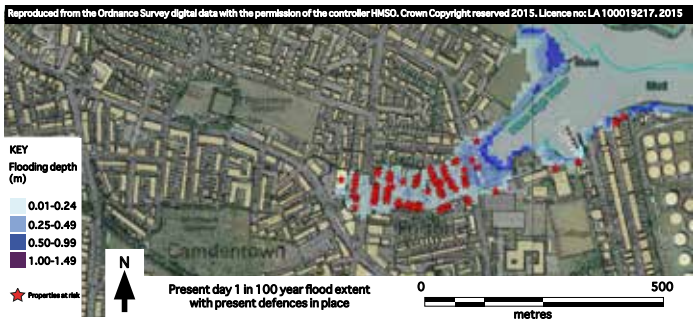
72 properties in the Forton area are at present day risk of flooding from a 1 in 100 year flood event. This is expected to increase to 232 properties by the year 2060.

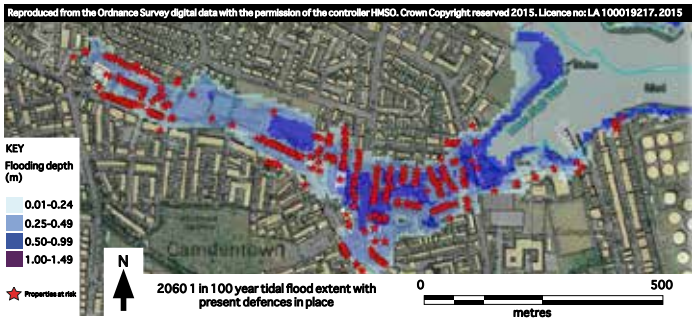
Number of properties at risk from a 1 in 100 year probability tidal flood event in Alverstoke

YEAR	RESIDENTIAL	COMMERCIAL	TOTAL
2015	72	0	72
2060	217	15	232
2115	549	49	598



LDA Design image of Forton Landscape Plan





Properties and assets at risk from coastal flooding:

- The residential area of Forton
- St Vincent's Sixth Form College
- Areas of open space and recreation ground
- 4 listed and 2 local listed buildings
- Forton Lake - a sensitive site that is environmentally designated
- Critical infrastructure and extensive urban utilities and services:
  - The A32/Forton Road
  - 3 electricity sub-stations
  - Surface water pumping station & sewers
  - Pressure gas mains
  - Telecoms and cable networks

The proposed scheme covers approximately 200m of coastal frontage, with the tidal flood route located at the western end of Forton Lake. Flooding poses most risk to the low lying urban residential area. By 2060 the flood extent will have increased to 750m; extending as far back as St Lukes Road.

Funding and Contributions

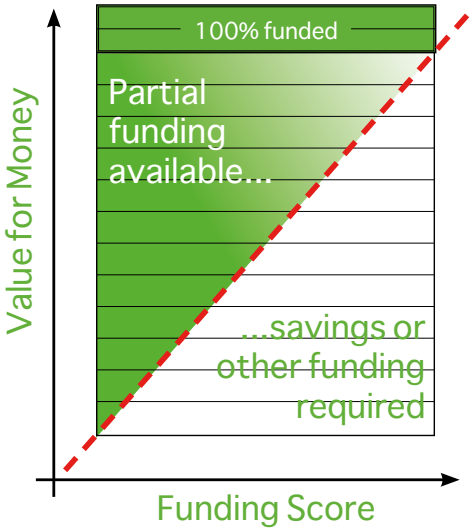
GOSPORT Borough Council

Partnership funding

It is estimated that the costs of improving the coastal defences at Seafield, Forton and Alverstoke could amount to between £3.5 million - £4 million over the design life of the scheme.

The Government has put in place a mechanism for funding flood and coastal erosion risk management schemes called Partnership Funding. The principles are quite simple, where projects do not qualify for full government funding, external funding contributions can be sought to make up the shortfall.

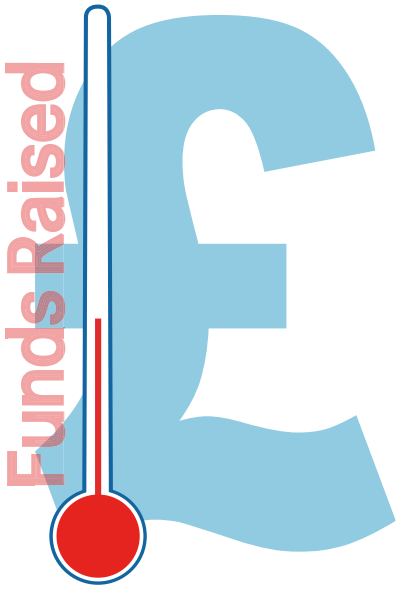
We have secured £546,700 of funding from the Environment Agency for the Alverstoke scheme and £656,000 for the Forton Scheme. These funds are to progress the detail design and to construct both schemes. We have also secured £227,000 of funding to progress the Seafield scheme to enhanced outline design.



We are actively working within the council and with external partners to explore opportunities to maximise contributions and funding opportunities for these schemes.

How could you contribute?

We always try to do more to maximise value for money and seek contributions for our projects. This will allow the Grant to go further and protect more properties from flooding.



Raising funds and contributions to the scheme may also allow us to increase benefits of our work such as:

- Increasing the standard or height of the structures
- Improving the quality of materials to be used
- Increasing certainty and accelerating programmes for projects to be delivered
- Delivering other benefits to local communities

We are interested to hear your ideas on ways in which we could seek more value from our work. Examples may include:

- Offers to work in partnership to deliver combined outcomes
- Providing financial contributions or sponsorship
- Promoting contacts and networks with whom we should work
- Supporting the work by advertising and promoting its cause
- Offering access through private land or site set up arrangements
- Suggesting other ways to demonstrate savings

Option Development

GOSPORT Borough Council

Option appraisal process

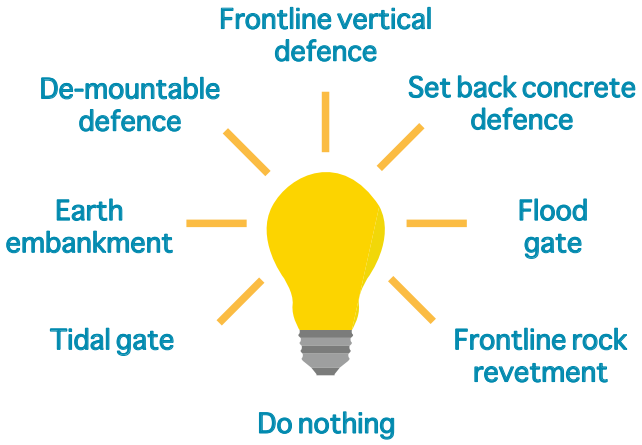
A long list of options was developed based on flood alleviation scheme construction methods and the existing topographical and physical constraints. This included options that were compliant and non-compliant with the "hold the line" policy.

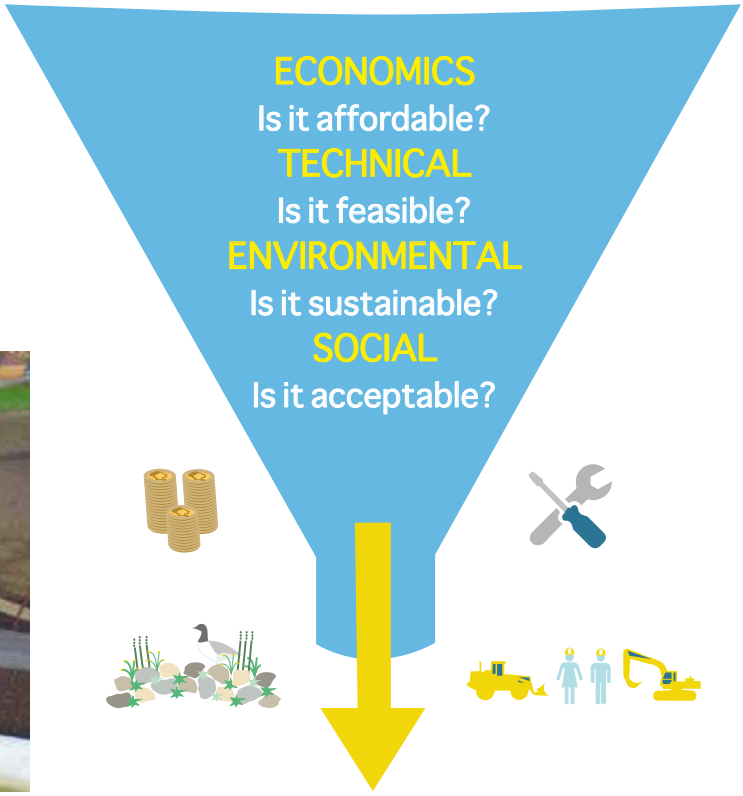
As well as providing a 1 in 100 year standard of protection, the options were judged against these targets:

- **Strategy/Policy**
- **Environmental impacts: Biodiversity/habitats/heritage**
- **Affordability and economic impacts**
- **Technical suitability**
- **Social impacts**

The long list of options was then refined, and critiqued by an expert group into a shortlist of options which was brought forward to outline design development. This narrowed the list down to a preferred design.

As the foreshore is environmentally designated, options that required significant encroachment into this area were eliminated from the process. Options which run along set back alignments were also discounted, as they did not fulfil the requirements of the 'Hold the Line' strategy and were typically higher cost options.





Alverstoke

GOSPORT Borough Council

What is the detailed design being promoted?

The existing defences along this frontage are a mixture of concrete block and masonry walls, and informal defences. The existing defences provide only a 1 in 20 year standard of flood protection. Subsequently Alverstoke is at very significant risk of flooding from coastal flood events.

The detailed design presented here is:

- Preserve the existing masonry wall and construct a new upstand wall on top of the existing wall
- Little Anglesey Road will need a set of flood gates which would be deployed in the event of a flood warning
- This new upstand wall will increase the overall height of the wall to provide a 1 in 100 year standard of protection
- The new design will also be sensitive to the Anglesey and Alverstoke Conservation areas and will be required to give users continued safe and enjoyable access and views of the coastline.

Before

Photo © LDA Design

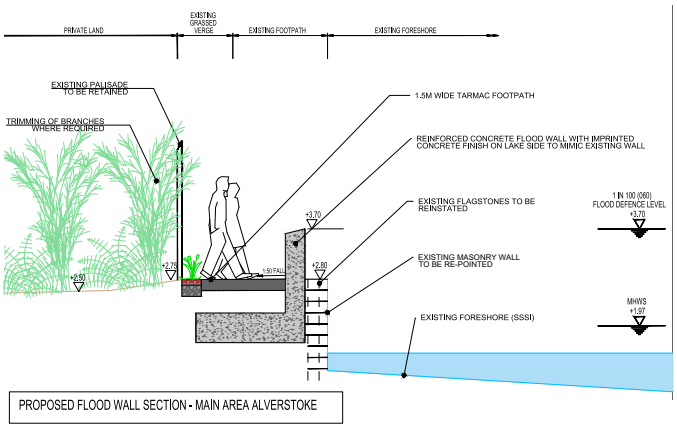
After Artist impression

LDA Design visual of Alverstoke Coastline

Flood Gate

Source: 1st Defence Fabrication

Cross Section



PROPOSED FLOOD WALL SECTION - MAIN AREA ALVERSTOKE

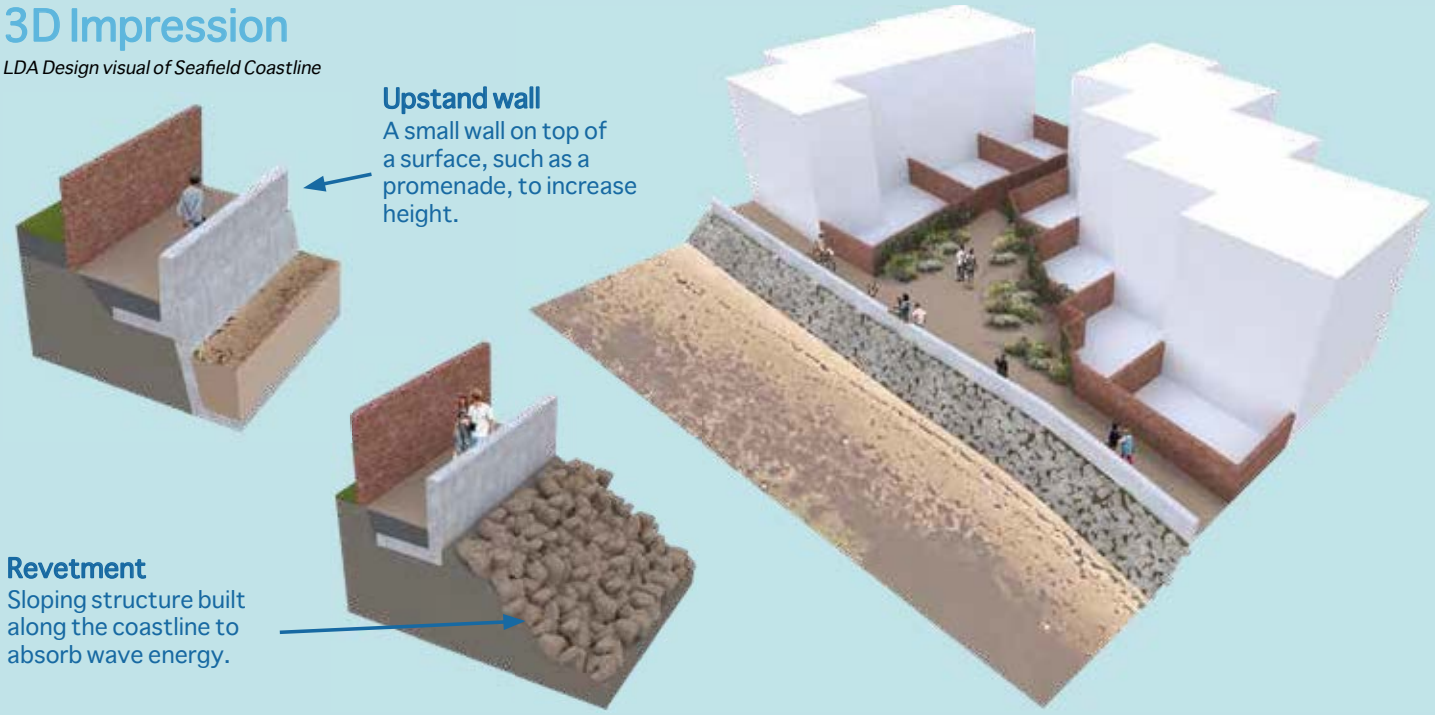
Seafield

GOSPORT Borough Council

What is the outline design?

3D Impression

LDA Design visual of Seafield Coastline



Before

Photo © LDA Design

After Artist impression

LDA Design visual of Seafield Coastline

The existing defences along this frontage are a mixture of masonry and concrete vertical walls, sloping revetment structures *(see image)* and undefended coastline. Some of these defences have already reached the end of their serviceable life.

The existing defences provide only a 1 in 20 year standard of flood protection. Subsequently Seafield is at very significant risk of flooding from coastal flood events.

The leading options being presented are:

- Upgrade or encase the existing vertical walls and construct a new upstand wall
- Upgrade or replace the existing sloping revetment and construct a new upstand wall

This new upstand wall will increase the overall height of the structure to provide a 1 in 100 year standard of protection.

Sensitive design of the coastal defences will be required to give users continued safe and enjoyable access and views of the coastline.

The new design will endeavour to improve access to the coastal footpath wherever possible.

Forton

GOSPORT Borough Council

What is the detailed design being promoted?

The existing defences along this frontage are a mixture of concrete block walls and sheet piled walls. The existing defences provide only a 1 in 20 year standard of flood protection. Subsequently Forton is at very significant risk of flooding from coastal flood events.

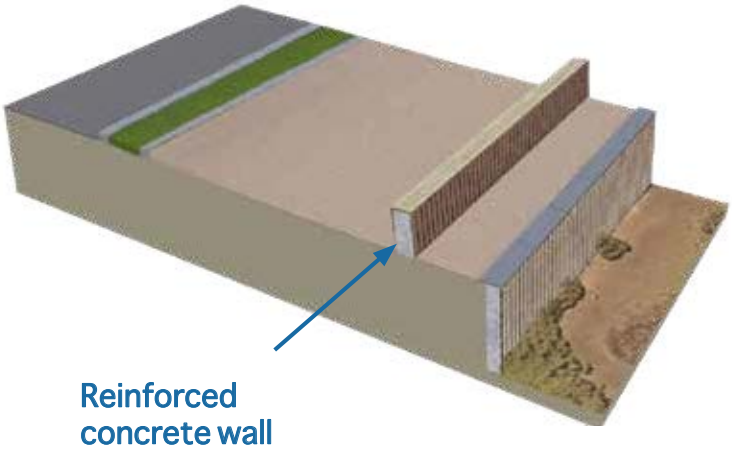
The leading option being presented here is:

- Repoint the existing walls and construct a new set back wall
- Road raising and dynamic flood defences to be installed within St Vincent's College

This new set back wall will increase the overall height of the wall to provide a 1 in 100 year standard of protection.

Sensitive design of the coastal defences will be required to give users continued safe and enjoyable access and views of the coastline.

The new design will also be sensitive to the existing heritage features within St Vincent's College.

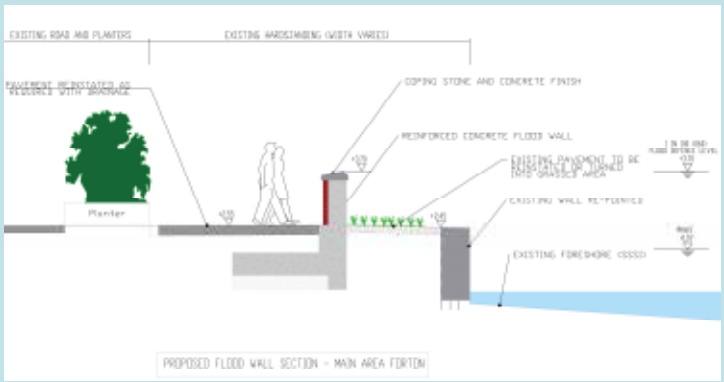


Reinforced concrete wall

Before

Photo © LDA Design

After Cross section image



Opportunities

GOSPORT Borough Council

The development of these 3 flood defence schemes presents an opportunity for enhancing the local areas. Subject to funding these could include more social spots, seating, decorative greenery and landscaping.

Alverstoke - Flood Defence Artist Impression

Seafield - Flood Defence Artist Impression

Forton - Flood Defence Artist Impression

Photo © LDA Design

Integrating flood defences

Seating

There could be opportunity to introduce new seating and even integrate seating and social spaces into the flood defences.

Re-imagining the incidental spaces

Introducing more green

Narrow footways and large planters restrict movement. Can we enhance the public spaces by introducing more green and decorative plants?

Photo © LDA Design

Interaction with the water

There could be opportunity to encourage greater use of the water and the waters edge.

Children's play

There could be an opportunity to improve the children's play area in Seafield

Photo © LDA Design

Environment and Heritage

GOSPORT Borough Council

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

This map shows the environmental designations within Gosport in relation to the 3 scheme sites.

Site of Importance for Nature Conservation (SINC)

Site of Special Scientific Interest (SSSI)
Special Protected Area (SPA) Wetland of International Importance (Ramsar Convention)

Scheme Site

Environmental Designations

Internationally important populations of rare wildfowl and wading birds visit Portsmouth 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).

Ecological Surveys

We have completed specialist habitat surveys to confirm which species could be impacted by the works. These surveys will be consulted on with ecological experts including Natural England, the Environmental Agency, RSPB, Hampshire and Isle of Wight Wildlife Trust and Hampshire County Council's ecology team.

The ESCP will be working with Gosport Borough Council to improve and enhance the landscaping around each scheme, with focus on high quality, hard wearing materials.

Heritage

Gosport has a long military history, evidence of this can be found throughout the town offering immense historical value. Over 36 listed buildings will be protected by the tidal flood defences we are proposing at the 3 scheme sites, including St Vincent Sixth Form College and Alverstoke Conservation Area.

St Vincent Sixth Form College

In addition to its community and leisure facilities, it is of great local historical and cultural importance dating back to 1807 when it served as a Forton Barracks to the Royal Navy. In 1829 it became home to the Royal Marines until 1923. Soon after it was commissioned as a training establishment for Naval cadets and renamed HMS St Vincent, later becoming a sixth form college in the early 1970s.

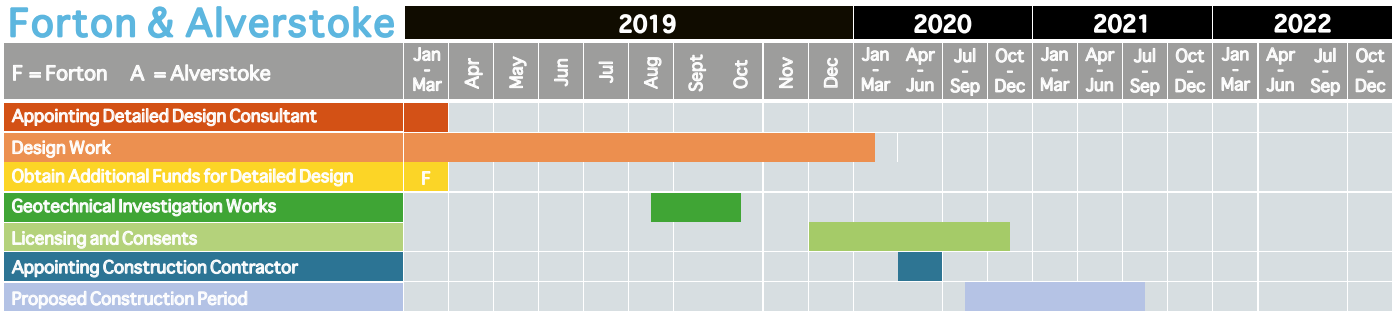
Alverstoke Conservation Area

Alverstoke Village has a series of individual and groups of statutory listed Grade II houses and villas, all of which lie within the flood risk area. The existing seawall within the Alverstoke scheme was constructed in the 1770s. The wall is being treated as a heritage asset throughout the scheme development and it is our aim to enhance the setting of the wall, not impact its significance to the area.

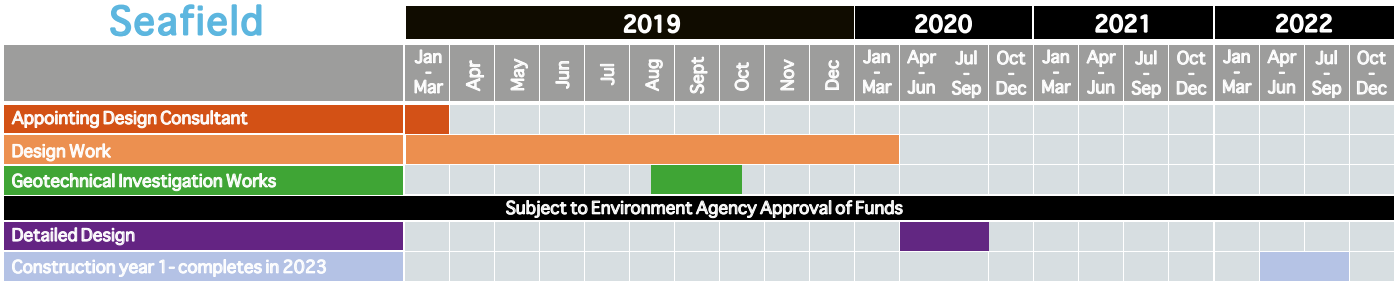
Present Timeline

GOSPORT Borough Council

Forton & Alverstoke



Seafield



Next Steps...

The next steps for the project are to complete the detailed design for Alverstoke & Forton due in early 2020, with the licensing and consenting process (planning permission, Marine Management Organisation consents etc.) starting at the end of 2019 and continuing into 2020. Procurement of the construction works will occur in 2020.

The enhanced outline design for Seafield is also being progressed with completion slightly after Alverstoke and Forton in early 2020, this take the design to a stage where planning permission could be submitted, but further detailed design would be required to take it to construction.

If you would like further information, please get in touch with us at: coastal.team@havant.gov.uk
Alternatively, contact us on social media.

Find out More

To monitor the progress of these schemes and to receive regular updates of other projects and events, please follow us online via one of the links below.

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Jackie Spencer Bridge

GOSPORT Borough Council

One of the options on the longlist was to construct a tidal gate at the Jackie Spencer Bridge. This was rejected for the following reasons:

Environmental impact on the saline lagoon – this was the main cause for rejection as the construction/operational impact and alteration of the saline lagoon is considered environmentally unviable, in addition to:

- High construction costs
- Technical suitability
- Maintenance and operation
- Not in line with the policy

For these reasons the option did not meet the appraisal targets and it was not brought forward to outline design phase.

Figure 1 Location Plan

During the short listing process the option of a tidal gates at Jackie Spencer Bridge did not make it through to the short list due to these 2 significant issues with the option.

Cost – the tidal flap option is 3 times the cost of the preferred option of repointing the existing wall and construction of a new upstand wall.

Environmental Designations – The lake is subject to number of environmental designations (SPA, Ramsar) and a saline lagoon. As part of the protection for these habitats under environmental law we are not able to undertake works which would be to the detriment of the habitat and associated species. The proposal of tidal flaps would reduce the tidal flow in and out of the western lake area which could have the potential to be detriment to the existing habitats present, so would not be lawful to undertake the work.

Maintenance & operation – majority of preferred option is a passive defence, with operation response only required for floodgate. Floodgate has easier access for maintenance than tidal gate for lower future maintenance costs.

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