

Lowestoft Flood Risk Management Project

Consultation 30th October to 14th December 2017

Flooding from the sea



Introduction

During the December 2013 tidal surge over 160 homes and businesses in Lowestoft were flooded. In addition to this road and rail networks were significantly disrupted.

The Lowestoft Flood Risk Management Project is about developing a way forward to reduce the risk of flooding from the sea, rivers and from extreme rainfall. The target date for completion is 2020 and when finished, the project will support the economic growth and regeneration of Lowestoft and reduce the risk of flooding to existing homes and businesses.

In order to obtain Environment Agency approval to access national funding and to build a strong business case for the project's other funders, such as the New Anglia Local Enterprise Partnership, an overarching strategy has been developed to support the project. This includes modelling and studies, such environmental studies to help make sure that we are doing the right thing in the right way. These studies will also support the project's planning application for construction of the tidal walls and a Transport Works Act Order application that is needed for the tidal barrier.

A vital part of the project is working with, involving and consulting, local communities, businesses and organisations. Your views are important. At various points in the project there will be public consultations, providing everyone with a chance to have their say. We have also been meeting with communities and businesses throughout the process. In addition, we have formed a Business and Community Advisory Group to support the project. This is independently chaired by SSE and vice chaired by Lowestoft Rising. The project is being managed by Coastal Partnership East on behalf of the project partners and Waveney District Council as lead authority. Partners include Waveney District Council, Suffolk County Council, the Environment Agency, Anglian Water, Associated British Ports, the New Anglia Local Enterprise Partnership and Waveney and Lowestoft Chamber of Commerce.



What are we considering and how has the project progressed?

Flooding from the sea

The main risk from tidal flooding is from the sea caused by a tidal surge that develops in the North Sea along the eastern coastline of the United Kingdom as was demonstrated by the events in 1953 and most recently in December 2013. Lowestoft has very limited existing tidal flood defences and without this investment, the town will remain at significant risk.

The part of the project addressing tidal flooding covers the areas of Lowestoft deemed to be at significant risk between the Outer Harbour and the western end of Lake Lothing at Mutford Lock.

In deciding the best ways in which we should manage flood risk in Lowestoft now and in the future, we have carried out a number of studies looking at:

- the current extent and risk of flooding
- how flood risk could increase in the future through the impacts of climate change
- the costs and benefits of providing different flood risk management solutions

How are we assessing what solutions will work best?

In assessing the possible options the following criteria have been used to decide which offer the best with ways to manage tidal flood risk in Lowestoft now and in the future:

- Level of flood risk reduction
- Impact on navigation
- Impact on residents and businesses
- Environmental and landscape impact
- Impact on highways and bridges
- Buildability
- Delivery timescale
- Cost – capital and whole life
- Potential regeneration benefits
- Potential benefits linked with 3rd Crossing project

Flooding from rivers and extreme rainfall

Vulnerability to surface water flooding in Lowestoft, particularly around Kirkley Stream, Aldwick Way and Velda Close, was starkly demonstrated in July 2015. The project is exploring options to reduce the risk to properties vulnerable to flooding from extreme rainfall. The criteria for assessing potential options are the same as for the tidal project. Extensive modelling has already been completed and final options will be consulted on during October and November. These include:

- Upstream storage
- Sustainable Drainage Systems
- Improving conveyance of water through the stream
- Installing non-return valves
- Local mitigation measures such as property level protection
- Construction of a flood wall

As well as further studying the technical aspects of these options, we are looking at whether they provide benefits during more frequent and / or more extreme storms. Our ability to deliver some of these options will depend on the availability of suitable land and landowners' co-operation.

Maintenance has already taken place to improve capacity and conveyance and a planned programme of future maintenance is already in place.

Project progression

In May 2016 the Environment Agency's Large Project Review Group (LPRG) approved our Strategic Outline Case. In June 2017 Waveney District Council, as lead council, approved the progression of the project to Outline Business Case and the development of a Transport Works Act Order (TWAo) application.

The Outline Business Case will be presented to LPRG in early 2018. This is the final stage to pass through with the Environment Agency and will then allow the project to access Flood Defence Grant in Aid funding.

A Parliamentary Agent has been appointed (Bircham, Dyson, Bell) to progress the TWAo application. Once the Outline Business Case has been successfully signed off by LPRG and Waveney District Council and Suffolk County Council, a planning application can be submitted mid year 2018 for the construction of the tidal walls. Once the planning application has been approved then construction can begin.

Dependent upon the public consultation starting in late October, a preferred option for the pluvial and fluvial element of the project has been agreed then work can progress post LPRG approval of the Outline Business Case in spring 2018.

How has the project been procured?

The project has been procured through the SCAPE procurement framework. SCAPE is a framework owned and designed by five local authorities. The project is managed through the Civil Engineering and Infrastructure package and delivered by Balfour Beatty.

How is the project addressing the potential of tidal flooding to Lowestoft in the interim period?

In November 2016 we took delivery of 1400m of temporary flood barriers which will help to reduce the risk of flooding to Lowestoft whilst the main project is being completed. We have worked closely with partners such as the blue light services, the Environment Agency, Associated British Ports and Highways England to make sure that we have the right plans and people in place. So should we receive advice

that the flood barriers need to be put up, everything is in place to ensure that this can happen in a timely fashion.

Such an event happened in January 2017 and the barriers were deployed safely and in time, although due to a change in wind direction not tested at this time. On 26th and 27th September the temporary barriers will be part of an annual emergency planning session which will see them deployed and equipment checked ahead of winter. The Lowestoft temporary flood barriers are managed by Coastal Partnership East on behalf of Waveney District Council and deployed in partnership with the Water Management Alliance and Waveney Norse.



Before



After

ABP Port Entrance

- Steel mitre gates will be installed on both the incoming and outgoing road to Port. The gate height will be approximately 1.3m.
- The walls leading from Waveney Road to the flood walls will comprise brick clad steel sheet pile flood wall with concrete cap. The height of wall will vary from 1.2-1.3m above road level. The wall will incorporate steel sheet pile cut-off below ground to stop seepage.
- Security fencing will be installed on top of and flush with the outer face of the proposed flood wall. Finished level of the fence will be 2.4m above the footpath level as specified by the ABP.
- Security fencing will be in accordance with Department for Transport Maritime Security requirement and as per agreement with ABP (Weld mesh fence to BS 1722.14)
- A section of the proposed flood wall will comprise demountable flood barriers to provide an easy access or larger size trucks to enter straight into the port area. The demountable barriers for this section will be for the full height (to 2.4m above road level) and it is envisaged that ABP will only remove these demountable barriers as and when access for larger size trucks will be required.
- The foot path on the north-western side of the proposed flood gates will comprise demountable barrier.
- Demountable barriers alignment will incorporate steel sheet pile cut-offs below ground to arrest seepage. Where utility services will prohibit installation of cut-off wall, injection grouting will be utilised to reduce seepage.
- On the ground, a base or sill beam will provide a levelled surface for the installation of demountable barriers. The sill beam will be flush with the existing ground and will delineate alignment of the proposed demountable barriers for the users to keep it clear.
- Sill beam will incorporate fixing bolts (set below ground level) for vertical supports channels for demountable barriers at regular interval.



Before



After

Waveney Road

- Proposed flood wall will follow the alignment of existing palisade fence along the Waveney Road
- The flood wall will comprise steel sheet pile brick clad flood wall with concrete cap, 600-700mm high above footpath level and will incorporate cut-off wall below ground to arrest seepage. Where utility services will prohibit the installation of a cut-off wall, injection grouting will be utilised to reduce seepage
- Security fencing will be installed on top of and flush with the outer face of the proposed flood wall. Finished level of the fence will be 2.4m above the footpath level as specified by the ABP.
- Security fencing will be in accordance with Department for Transport Maritime Security requirement and as per agreement with ABP (Weldmesh fence to BS 1722.14)



Station Square Part 1

- Proposed flood wall will follow the alignment of existing palisade fence along the Waveney Road
- The flood wall will comprise steel sheet pile brick clad flood wall with concrete cap, 600-700mm high above footpath level and will incorporate cut-off wall below ground to arrest seepage. Where utility services will prohibit the installation of a cut-off wall, injection grouting will be utilised to reduce seepage
- Security fencing will be installed on top of and flush with the outer face of the proposed flood wall. Finished level of the fence will be 2.4m above the footpath level as specified by the ABP.
- Security fencing will be in accordance with Department for Transport Maritime Security requirement and as per agreement with ABP (Weldmesh fence to BS 1722.14)



Station Square Part 2

- Proposed flood wall will follow the alignment of existing palisade fence along the Waveney Road
- The flood wall will comprise steel sheet pile brick clad flood wall with concrete cap, 600-700mm high above footpath level and will incorporate cut-off wall below ground to arrest seepage. Where utility services will prohibit the installation of a cut-off wall, injection grouting will be utilised to reduce seepage
- Security fencing will be installed on top of and flush with the outer face of the proposed flood wall. Finished level of the fence will be 2.4m above the footpath level as specified by the ABP.
- Security fencing will be in accordance with Department for Transport Maritime Security requirement and as per agreement with ABP (Weldmesh fence to BS 1722.14)



Before



After

Tidal Flood Barrier

- Proposed tidal barrier will comprise a concrete structure and steel mitre gate aligned with Bascule Bridge. Below the river bed, steel sheet pile cut offs will be installed to stop seepage from underneath the structure
- The barrier will be 28m clear width for port and navigation use.
- Gate top level will be approximately 600mm higher than the existing road level at Bascule Bridge to provide 1 in 200 years standard of defence (includes allowance for the expected climate change over next 100 years).
- Tidal barrier gate will be operated and controlled from existing control building, using hydraulic rams through the existing power supply.
- Floodwalls either side of the barrier will comprise demountable flood barriers and will only be deployed when required.
- Demountable barriers alignment will incorporate steel sheet pile cut-offs below ground to arrest seepage. Where utility services will prohibit installation of cut-off wall, injection grouting will be utilised to reduce seepage.
- On the ground, a base or sill beam will provide a levelled surface for the installation of demountable barriers. The sill beam will be flush with the existing ground and will delineate the alignment of the proposed demountable barriers for the users to keep it clear.
- The Sill beam will incorporate fixing bolts (set below ground level) for vertical supports channels for demountable barriers at regular interval.



Before



After

Yacht Club (north side)

- The proposed glass flood wall will continue to the end of the existing awning. Further to the north, the proposed flood defence along the edge of quay side will comprise demountable flood barriers (with supports). The demountable barriers will continue around the boat slipway and through the boat storage area to meet the proposed barrier.
- Along the suspended quay slab, steel beams will be installed below suspended slab to transfer load from the proposed demountable barriers to the quay walls structure
- Height of demountable barriers will vary from 800mm to 1m
- Demountable barriers alignment will incorporate steel sheet pile cut-offs below ground to arrest seepage. Where utility services will prohibit installation of cut-off wall, injection grouting will be utilised to reduce seepage.
- On ground, a base or sill beam will provide a levelled surface for the installation of demountable barriers. The sill beam will be flush with the existing ground and will delineate the alignment of the proposed demountable barriers for the users to keep it clear.
- Sill beam will incorporate fixing bolts (set below ground level) for vertical supports channels for demountable barriers at regular interval.



Before



After

Yacht Club (south side)

- The south side of the Royal Norfolk & Suffolk Yacht Club building will comprise 1m high glass wall
- Access point to marina will have demountable aluminium barrier to slotted into guide channels incorporated into the glass wall.
- Steel beams will be required under the suspended slab to support and transfer load from proposed glass wall to the quay structure



Yacht Club (central view)

- The flood defences in front of Royal Norfolk & Suffolk Yacht Club (RN&SYC) will comprise 1m high glass wall along the existing awning and on south side of the yacht club building.
- Access point to marina will comprise demountable aluminium barrier to slot into the guide channels incorporated in the glass wall.
- Steel beams will be required under the suspended slab to support and transfer load from proposed glass wall to the quay structure.



Before



After

South Pier

- Existing wall along the south pier amusement arcade will be replaced with 700-800mm high brick clad wall with concrete coping
- Above the proposed wall, flood defence will comprise glass panels to provide flood defence benefit while providing unhindered view to the marina and the outer harbour
- Finish height of the glass panel will be 1.8 to 2m above the pathway or road level
- A glass panel wall will be flush with the outer face of the brick clad wall
- The last length of the flood defence across the south pier will comprise demountable barriers section.
- Demountable barriers alignment will incorporate steel sheet pile cut-offs below ground to arrest seepage. Where utility services will prohibit installation of cut-off wall, injection grouting will be utilised to reduce seepage.
- On the ground, a base or sill beam will provide a levelled surface for the installation of demountable barriers. The sill beam will be flush with the existing ground and will delineate the alignment of the proposed demountable barriers for the users to keep it clear.
- Sill beam will incorporate fixing bolts (set below ground level) for vertical supports channels for demountable barriers at regular interval.



Before



After

Outer South Pier

- Existing wall along the south pier amusement arcade will be replaced with 700-800mm high brick clad wall with concrete coping
- Above the proposed wall, flood defence will comprise glass panels to provide flood defence benefit while providing unhindered view to the marina and the outer harbour
- Finish height of the glass panel will be 1.8 to 2m above the pathway or road level
- A glass panel wall will be flush with the outer face of the brick clad wall
- The last length of the flood defence across the south pier will comprise demountable barriers section.
- Demountable barriers alignment will incorporate steel sheet pile cut-offs below ground to arrest seepage. Where utility services will prohibit installation of cut-off wall, injection grouting will be utilised to reduce seepage.
- On the ground, a base or sill beam will provide a levelled surface for the installation of demountable barriers. The sill beam will be flush with the existing ground and will delineate the alignment of the proposed demountable barriers for the users to keep it clear.
- Sill beam will incorporate fixing bolts (set below ground level) for vertical supports channels for demountable barriers at regular interval.



Hamilton Road Part 1

- The proposed floodwall from the western end of Hamilton Road to the entrance of Kwik fit car garage will comprise brick clad steel sheet pile wall with concrete coping, incorporating cut-off below ground to arrest seepage and provide stability to the flood wall. The wall height above ground will vary from 500-800mm
- From Kwik fit garage to Associated British Ports rear entrance, the length will comprise demountable flood barriers with a height of 800mm to 1.2m
- Demountable barriers sections will incorporate steel sheet pile cut-offs below ground to arrest seepage. Where utility services will prohibit installation of cut-off wall, injection grouting will be utilised to reduce seepage.
- On ground, a base or sill beam will provide a levelled surface for the installation of demountable barriers. The sill beam will be flush with the existing ground and will delineate the alignment of the proposed demountable barriers for the users to keep it clear.
- Sill beam will incorporate fixing bolts (set below ground level) for vertical supports channels for demountable barriers at regular interval.
- Further east of the demountable section, the floodwall will comprise concrete clad steel sheet pile wall incorporating cut-off. Where utility services will prohibit installation of cut-off wall, injection grouting will be utilised to reduce seepage. The height of the flood wall above ground will vary from 1.2-1.3m.



Before



After

Hamilton Road Part 2

- The proposed floodwall from the western end of Hamilton Road to the entrance of Kwik fit car garage will comprise brick clad steel sheet pile wall with concrete coping, incorporating cut-off below ground to arrest seepage and provide stability to the flood wall. The wall height above ground will vary from 500-800mm
- From Kwik fit garage to Associated British Ports rear entrance, the length will comprise demountable flood barriers with a height of 800mm to 1.2m
- Demountable barriers sections will incorporate steel sheet pile cut-offs below ground to arrest seepage. Where utility services will prohibit installation of cut-off wall, injection grouting will be utilised to reduce seepage.
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Considering the environment

In accordance with relevant legislation, the tidal barrier element of the LFRMP (the tidal barrier scheme) is considered to require a statutory Environmental Impact Assessment (EIA) to inform the applications for the various consents required for the scheme – the Transport Works Act Order, marine licence and planning consent. A Preliminary Environmental Information Report (PEIR) has been prepared to provide a preliminary analysis of the environmental issues, risks and opportunities associated with the tidal barrier scheme and identify any potential effects that will require further assessment – i.e. the 'scope' of the EIA. It will be used to support a request for a statutory EIA scoping opinion for the tidal barrier

scheme from the consenting authorities for the scheme: The Secretary of State for Environment, Food and Rural Affairs and the Marine Management Organisation. The PEIR considers only the tidal barrier element of the LFRMP.

We would welcome your feedback on the PEIR. You can access a PDF version on our website www.lowestoftfrmp.org.uk an online feedback form can also be found here.

If you would like a printed copy of the PEIR and feedback form please email sharon.bleese@eastsoffolk.gov.uk

Tell us what you think

Your views are extremely important to the development and successful delivery of the Lowestoft Flood Risk Management Project. We'd like to know what you think about our proposals for the look of the walls and barrier. If you are a river user we'd like to hear how you feel this might affect you. We would also like your feedback about the Preliminary Environmental Impact Report.

Telling us what you think is simple, please visit our website www.lowestoftfrmp.org.uk and you can complete our feedback form online. Or if you'd like a hard copy just email sharon.bleese@eastsoffolk.gov.uk

Keeping in touch

If you'd like to be kept in touch with the project's development please email Project Manager Sharon Bleese at sharon.bleese@eastsoffolk.gov.uk
You can also contact us by telephone on **01502 523346**

Or by post:

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Our Partners

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NEWANGLIA
Local Enterprise Partnership
for Norfolk and Suffolk

Waveney
District Council

Suffolk
County Council

Environment
Agency

Suffolk
Chamber of
Commerce
Lowestoft & Waveney

ABP | ASSOCIATED
BRITISH PORTS

Managed by

coastal
partnership
east

Our Contractors

Balfour Beatty

ch2m

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