

# York Flood Alleviation Scheme

## Update for 4 December Decision Session

November 2017

At September's Decision Session we provided an overview of the range of projects ongoing in York, from the Foss Barrier to the 5 Year and Long Term Plans. Here, we want to provide greater detail on progress towards the delivery of new or upgraded flood defences in the city through the 5 Year Plan.

## Summary of Recent Activities

### Topographic Surveys

We have now completed ground level and threshold surveys in the city on both banks of the Ouse downstream of Skeldergate Bridge. This data is informing the development of detailed options in this area prior to public consultation later in the year.

### Geotechnical Studies

Given the scale of potential works within the city, we anticipated that a significant programme of ground investigations would be required. Inevitably this work will create temporary disturbance in some areas. In light of this we have been conducting detailed reviews of previous investigations across the city, to reduce the number of potential ground investigation sites. Our engineers have also visited a number of locations across the city to evaluate the practicalities of conducting surveys in these areas. Discussions with key stakeholders are taking place to ensure necessary investigations are scheduled to minimise disturbance.

### Structural Surveys

York's river frontage is already heavily developed. Therefore there is limited potential to create new standalone flood defences along the riverside. New defences will in some instances need to tie in to existing buildings. In order to determine whether this is feasible, we have begun the process of surveying buildings in key areas. Using existing buildings will minimise the visual impact of new defences, and should lead to less disturbance during construction.

### Engagement with Key Stakeholders

We have recently convened an Advisory Group of key stakeholders to discuss upcoming issues and ensure we maximise the potential benefits of the scheme. The group consists of representatives from the fields of archaeology, heritage, business, utilities, planning, ecology, and flood risk. The initial meeting of the group served as an opportunity to bring all parties up to speed on proposals, and the next meeting in December will focus on ground investigation works and discussion of the shortlisted options in Clementhorpe and New Walk.

### Flood Warning Changes

One of the actions from the Independent Review of the 2015 floods was to investigate ways to improve flood warnings further. We have recently completed a review of the warnings we issue in York, following the completion of new flood risk modelling. On the Ouse, there were very few changes which confirms that the understanding we have of the flood risk on the Ouse is current and relevant. For the Foss, changes have been made to areas covered by each flood warning, making them more relevant to the communities they cover.

The understanding of what rainfall and river levels are in the Foss catchment will also improve. This is via a rain gauge which has been installed in the upper Foss catchment, 20 miles north of York. This will be followed by a river level gauge being installed in December just north of Strensall on the Foss. This data will feed directly into a better river forecast for the Foss and support more intelligent operation of the Foss Barrier in York.

## Habitat Surveys

There is a defined window in which to conduct ecological surveys. In order to ensure that ground investigations could commence without delay, we took the decision to conduct initial habitat surveys over large areas of the city at an early stage. Not only has this informed the need for more detailed surveys in key areas, but crucially will enable us to begin ground investigation works without having to wait until the start of the ecological survey season next year.

## Appraising Climate Change Methodology

Key to our works to improve the defences in the city we are looking at how climate change might impact water levels in the future. Current modelling predicts a significant rise in flood levels over the next century. This obviously has implications for the height of defences in the city. Therefore we are looking at different ways of providing improved protection, including upstream storage, local defence raising and combinations of both. This work will also help us determine when best to invest in different types of solutions.

## Shortlisting Options

In conjunction with the survey and feasibility work ongoing at this time, we are in the process of shortlisting viable options for each flood cell (York is split into 29 distinct flood cells, each of which represents a geographical area where the flood risk to that area is self-contained and can be mitigated by flood risk measures e.g. walls, embankments and gates. Most cells will require a number of flood risk measures at different locations to reduce the overall risk of flooding to that cell). Within this project we have shortlisted 18 flood cells (19 flood cells including Clifton Ings and Rawcliffe) to progress further. Actions in other flood cells will be progressed through future projects.

Priority has been given to undefended areas and shortlisting has been progressed furthest in these areas. This will enable us to consult with residents in these areas on a shortlist of viable options, to determine the optimal solution. Shortlisting for the remainder of the cells is ongoing.

## Public Engagement

Due to the ongoing survey and shortlisting process, over the past 3 months, our engagement work has focused on updating residents about progress across the city, rather than specific events focussed on individual schemes. However now that detailed options appraisal for the first flood cells is well underway, we will be holding the first of many public drop in sessions. In contrast to the exhibitions we held last year, which were city wide in their content and audience, future events will be more targeted. We will be discussing details of specific schemes in distinct areas, and therefore we want to give priority to local residents in these communities to share their views.

Citywide engagement will of course continue through established media and social media channels, along with the opening of our new drop in centre at Wellington Row.

## Progress of Each Flood Cell

What follows is a brief summary of the current position of each flood cell within York. Outline options for each area were published in the 5 Year Plan in November 2016. The detailed feasibility work ongoing since then has helped to clarify options in each area. Given the number of flood cells, and the upcoming consultation events for the first schemes (which will begin in advance of the Decision Session), we have omitted detailed options for the purposes of this summary. The following serves as an update on current cell specific activities and reasoning for this.

Flood Cell	Status	Comment
<b>B16 - New Walk</b>	Within 5 Year Plan. Due for public consultation	We have identified a potential feasible solution to reduce the risk of flooding which also mitigates against any theoretical impacts of increased pumping from the Foss Barrier. We will be meeting with residents individually during November. In December we will be holding a public drop in event and then seeking to develop detailed designs by February 2018.
<b>B8 - Clementhorpe</b>	Within 5 Year Plan. Due for public consultation	As an area with limited current defences, this is a priority to progress. Numerous investigations have taken place and we will be consulting with local residents on potential options beginning in November. This consultation period will run until February with ample opportunity for residents to get involved. We will then use the results of this to produce a detailed design to submit for planning approval.
<b>B4 - Scarborough to Ouse Bridge (Right Bank)</b>	Within 5 Year Plan. Will consult on options January 2018	Modelling shows the need to increase the height of existing defences in this area, and develop solutions for Memorial Gardens and the Post Office car park. Discussion with key landowners is underway and consultation will focus on the best way to raise existing defences.
<b>F9 - South Beck</b>	Within 5 Year Plan. Undergoing assessment	Though our modelling only indicates that there are a small number of properties at risk from flooding we will be investigating the risk in more detail and from this assessing the potential for flood defence options for this area. We would consult with local residents on the options
<b>C3 - Naburn</b>	Within 5 Year Plan. Currently identifying locations for borehole surveys to inform design	We have been working closely with Naburn Flood Group for a number of years to tackle the various causes of flooding to the village. A detailed modelling study commissioned prior to the 2015 floods has provided clarity on the scale of risk and the interventions needed to reduce this. We are now looking to undertake ground investigations to confirm the viability of works before consulting residents on the preferred option.
<b>C2 - Acaster Malbis</b>	Within 5 Year Plan. Undergoing assessment	Due to flood flow routes in the area, developing a formal flood defence scheme would be extremely difficult. We will offer property level resilience options for affected properties.
<b>B9 - Fulford</b>	Within 5 Year Plan. Undergoing assessment	We are working closely with CYC to develop an effective solution to the issues in Fulford.
<b>C1 - Bishopthorpe</b>	Within 5 Year Plan. Undergoing	Records from recent flood events and our modelling shows the risk from flooding is greatest along a stretch of Bishopthorpe Road and Main Street/Chantry Lane. We will

	assessment	be investigating potential options in these areas and consulting with local residents.
<b>F4 - Tang Hall Beck</b>	Within 5 Year Plan. Undergoing assessment	Our modelling and experience from the 2015 floods shows that a significant flood flow into the Foss comes from both Tang Hall and Osbaldwick Becks. We are investigating opportunities to develop storage areas upstream of the city to reduce flood flows, as well as de-culverting within the city.
<b>F5 - Osbaldwick Beck</b>	Within 5 Year Plan. Undergoing assessment	Our modelling and experience from the 2015 floods shows that a significant flood flow into the Foss comes from both Tang Hall and Osbaldwick Becks. We are investigating opportunities to develop storage areas upstream of the city to reduce flood flows, as well as de-culverting within the city.
<b>F8 - Groves to Haley's Terrace</b>	Within 5 Year Plan. Undergoing assessment	Following the upgrade to the Foss Barrier we are investigating additional flood defence options for this area, including embankments and walls. We are also investigating opportunities to develop storage areas on the Foss upstream of the city to reduce flood flows.
<b>F10 - Haley's Terrace to Link Road</b>	Within 5 Year Plan. Undergoing assessment	Our modelling shows there is a risk of flooding to a number of properties along the stretch of the Foss in this area. We will be investigating options for this area as well as investigating opportunities to develop storage areas on the Foss upstream of the city to reduce flood flows.
<b>F11 - Link Road to Ring Road</b>	Within 5 Year Plan. Undergoing assessment	Though our modelling only indicates that there are a small number of properties at risk from flooding we will be investigating the risk in more detail and from this assessing the potential for flood defence options for this area.
<b>F12 - Westfield Beck</b>	Within 5 Year Plan. Undergoing assessment	Our records shows there is a risk of flooding to properties in this area. We will be investigating this risk in more detail and looking at potential flood defence options to mitigate the impact of the risk flooding. We will be engaging with local residents before any proposals are taken forward.
<b>B11 - Copping Farm to Scarborough Bridge (Left Bank)</b>	Within 5 Year Plan. Undergoing initial discussions with landowners	This flood cell covers a wide area with a range of different issues. There are a range of existing defences which will need to be raised in order to continue protecting homes and businesses into the future. We are in discussions with a number of landowners in the area to understand how best to incorporate a new scheme.
<b>B12 - Scarborough Bridge to Lendal Bridge (Left Bank)</b>	Within 5 Year Plan. Discussions ongoing with statutory bodies	A significant area of this flood cell falls within the historic city centre and therefore any scheme needs to have the support of heritage bodies. We are keen to ensure this support before shortlisting options.
<b>B15 - King's Staith to Skeldergate Bridge</b>	Within 5 Year Plan. Undergoing	As was highlighted in the publication of the 5 Year Plan, providing protection at King's Staith to the same level as elsewhere in the city would not be acceptable. We are

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	assessment	assessing the optimum size of any defence in this location to provide additional protection without negatively impacting the riverside amenity and neighbouring businesses. Due to government spending rules around cost benefit, this scheme may require additional funding support.
<b>B7 - Queen's Staith and Skeldergate</b>	Within 5 Year Plan. Undergoing assessment	There is potential to reduce flooding by installing floodwalls/gates between existing buildings on Skeldergate. This is dependent upon structural integrity and ground conditions which are currently under assessment. Until the outcome of this we cannot provide more detailed options.
<b>A5 - Upper &amp; Nether Poppleton</b>	Not looking to progress a scheme within 5 Year Plan	Assessment has shown that due to the very small number of properties affected and high cost of a solution, we cannot justify a scheme here under current government spending rules. We will revisit this if the situation changes.
<b>B1 - Millfield Industrial Estate</b>	Not looking to progress a scheme within 5 Year Plan	Assessment has shown that due to the very small number of properties affected and high cost of a solution, we cannot justify a scheme here under current government spending rules. We will revisit this if the situation changes.
<b>B3 - Clifton Bridge to Scarborough Bridge &amp; Hob Moor</b>	Improvements being delivered outside of 5 Year Plan. Preferred option in the design phase	Significant assessment of the options for this area has taken place following meetings with local residents. As a result the preferred option for this area is to increase the resilience of the Holgate Beck pumping station. Our consultants are currently identifying the best way to achieve this, with construction due in spring 2018.
<b>B10 - Clifton &amp; Rawcliffe</b>	To be delivered through a bespoke scheme. Currently in the detailed design phase	Central to this area are the upgrade to the embankment at Clifton Ings, and the formalisation of pumping arrangements for Blue Beck. These are both EA assets and we are committed to maintaining their effectiveness.
<b>B13 - Lendal Bridge to Ouse Bridge</b>	Not looking to progress a scheme through the 5 Year Plan	There are very few properties affected in this area, and there do not appear to be any technically feasible solutions.
<b>B17 - Nun Ings</b>	Not looking to progress a scheme through the 5 Year Plan	There are no properties at risk.

<b>F1 - Cliffords Tower</b>	Increased protection provided by the Foss Barrier	The £17m investment in the Foss Barrier provides additional protection in this area
<b>F2 - Hungate</b>	Increased protection provided by the Foss Barrier	The £17m investment in the Foss Barrier provides additional protection in this area
<b>F3 - Foss Islands</b>	Increased protection provided by the Foss Barrier	The £17m investment in the Foss Barrier provides additional protection in this area
<b>G6 - Foss Bank</b>	Increased protection provided by the Foss Barrier	The £17m investment in the Foss Barrier provides additional protection in this area
<b>F7 - Layerthorpe</b>	Increased protection provided by the Foss Barrier	The £17m investment in the Foss Barrier provides additional protection in this area



# Programme

Below is the planned dates for work for each flood cell. Local engagement will take place during each phase of the work, focused on that location.

	Preferred option		OBC	Detail design		Planning		FBC	Construction	
	Start	Finish		Start	Finish	Start	Finish		Start	Finish
<b>Tranche 1</b>										
B09 - Germany Beck C01 - Bishopthorpe C02 - Acaster Malbis C03 - Naburn	Mar-18	Jul-18	Feb-19	Mar-19	Oct-19	Jun-19	Feb-20	Dec-19	May-20	Dec-21
<b>Tranche 2</b>										
F08 - Huntington Road F09 - South Beck F10 - Haleys Terrace to Link Road F11 - Link Road to Ring Road F12 - Westfield Beck F4 & F5 - Tang Hall Osbaldwick	Mar-18	Jul-18	Feb-19	Mar-19	Oct-19	Jun-19	Feb-20	Dec-19	May-20	Dec-21
<b>Tranche 3</b>										
B07 - Queens Staithes and Skeldergate B11 - Copping Farm to Scarborough Bridge B12 - Scarborough Bridge to Lendal Bridge B15 - King Staithes	Jan-18	Mar-18	Aug-18	Aug-18	Apr-19	Nov-18	Aug-19	May-19	Oct-19	Jun-21
<b>Tranche 4</b>										
B04 - Scarborough Bridge to Ouse Bridge B08 - Clementhorpe	Dec-17 Dec-17	Jan-18 Jan 18	May-18 Apr-18	Mar-18 Feb 18	Apr-18 Apr-18	Jun-18 Apr-18	Dec-18 Nov-18	Oct-18 Aug-18	Jan-19 Nov-18	Oct-19 Mar 20
<b>Tranche 5</b>										
B10 - Clifton Ings B16- Foss confluence / New Walk	Nov-17 Nov-17	Dec-17 Mar-18	Jan-18 N/A	Jun-18 Apr-18	Nov-18 May-18	Feb-18 N/A	Nov-18 N/A	Nov-18 N/A	Feb-19 May-18	Dec-20 Nov-18

## Assumptions

There are a number of assumptions made when developing this programme, they include:

- 1 - Individual project approach to each cell for Environmental Impact Assessment
- 2 - Construction work on cells in the Tranches are likely to take between 6 to 12 months and we will work with the contractor on most efficient sequence for delivery for each tranche.
- 3 - Full business case approval will be awarded without planning permission
- 4 - Planning conditions not necessarily discharged before contract award
- 5 - B16 Foss Confluence / New walk to be completed as part of the Foss Barrier work and is likely to be Property Level Resilience.

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## Programme Risks

There are a number of risks that potentially could impact these delivery timescales. The risks are proactively being managed as part of the controls of the York FAS programme. Whilst mitigation plans are in place, there remains the potential for the risks to impact delivery timescales. The risks include:

- There is a risk that current assumption of a cell by cell approach to undertaking Environmental Impact Assessments (EIA) and planning approvals is not acceptable to City of York Council Planning. Options are currently being assessed and legal opinion sort with a view to consult with CYC on preferred approach to EIA and planning in December.
- This programme is reliant on a number of external (non-Environment Agency) organisations. We are building relationships and working with them to reduce the potential impact on this programme.
- Ground conditions or potential archaeological findings may impact timescales. To mitigate this risk surveys, bore holes and consultation with archaeological representatives will be carried out before the planning and construction stages.
- Challenges or different views to the proposed designs from individuals or groups may delay the planned programme. An engagement plan is being implemented to mitigate the risk.
- Prolonged or severe winter weather conditions or a server flood event could delay start or completion of the construction stage. Construction start dates, durations and sequencing to be considered to mitigate against this risk.

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# York Flood Cells Map

