

Leeds Flood Alleviation Scoping Report

Reducing flood risk in Leeds

March 2016

Summary

The Leeds Flood Alleviation Scheme Scoping Report sets out options to reduce flood risk to Leeds city centre and Kirkstall Road area. This work will take an integrated catchment approach, looking at both engineered and natural flood management measures across the entire catchment and uses latest modelling techniques.

The Environment Agency will establish and chair a Catchment Partnership for the River Aire to raise awareness of flood risk, increase resilience and reduce the risk of flooding where possible across the entire catchment. Leeds City Council will lead on the feasibility work to further reduce flood risk to Leeds city centre.

It is anticipated a full business case will be approved by Autumn 2017, with work to start later that year. Prior to 2021 significant progress will be made to reduce flood risk to the city centre and Kirkstall Road through the construction of raised defences and other engineered measures. These works may extend beyond 2021, along with other catchment wide initiatives and a long term programme of natural food risk management measures.

Introduction

The Leeds Flood Alleviation Scheme Scoping Report was commissioned by the Secretary of State for the Department of Environment, Food and Rural Affairs following the flooding experienced throughout Leeds on Boxing Day 2015. The report sets out options to be investigated further to reduce flood risk to the city centre and Kirkstall Road area, alongside an initial timetable for delivery.

Background

Leeds is an economic, employment and transport hub for the wider Leeds City Region and is an integral part of the Northern Powerhouse.

It is the UK's fastest growing city, with the economy forecast to increase by 25 per cent over the next 10 years. It is the main driver of a city region with a £56 billion economy, a combined population of 3 million and a workforce of 1.5 million. It has the most diverse economy of the all the UK's main employment centres and has seen the fastest rate of private sector jobs growth of any UK city. The city is the third largest employer by local authority area with 480,000 in employment and self-employment at the beginning of 2015.

The National Flood Resilience Review is now looking at the core eight cities in England, including Leeds, to ensure residents, businesses and infrastructure are properly protected for the future.

Work is currently underway along the River Aire in Leeds to deliver a flood alleviation scheme south of the train station to Thwaites Mill. This scheme is due to be completed in March 2017 and will reduce the risk of flooding to over 3,000 city centre flats, 500 businesses and unlock land for development and growth. The scheme will cost £45 million and is being funded by Defra, Leeds City Council and Regional Growth Fund.

Flood risk in Leeds city centre is influenced by the River Aire and the various tributaries including the Hol Beck, Wyke Beck and Meanwood Beck, with a very low onset of flooding in some locations. There are also some localised issues with surface water flooding.

Historical records from 1768 onwards contain numerous references to flooding in Leeds. The largest recorded event was in 1866 with other significant events occurring in 1946 and 2000. Smaller floods in 2004, 2005, 2007 and 2008 resulted in localised flooding which caused disruption to local residents, businesses and commuters.

Impacts of Boxing Day 2015 flood

The winter 2015 floods saw water levels on the River Aire 1.2m higher than previously recorded. The upper reaches of the Aire catchment saw three times the long-term rainfall average. Incidents of flooding happened along the entire length of the Aire catchment, with communities in Bradford and Leeds particularly badly affected.

Leeds city centre experienced significant flooding from the afternoon of 26 December into 27 December 2015. By the evening of 26 December there were nine Severe Flood Warnings issued. The last occasion that Severe Flood Warnings were issued in Leeds was in 2007.

The flooding in Leeds affected up to 2,000 residential properties (including indirect impacts to high-rise accommodation) and up to 400 commercial properties. This led to widespread disruption and flooding of major transport links including a major route into the city - the A65 Kirkstall Road. Critical infrastructure including electricity sub-stations and IT, communications and data centres were also affected with the electricity supply to 12,000 properties being temporarily affected.

Over 100 properties were protected from flooding by a recently completed scheme at Woodlesford.

Reducing flood risk in Leeds

In light of the Boxing Day 2015 floods, Leeds City Council has been asked, in partnership with the Environment Agency, to progress appraisal work, business case, site investigation, outline design, consultation and procurement to further reduce the risk of flooding to Leeds city centre. This scoping study covers the framework and next steps for completing this work.

Subject to business case approval, the Government has committed £35m between now and 2021 to a new scheme to enhance flood protection in Leeds, and will provide further funding after 2021 to complete this work. Once completed, this new scheme will provide a good level of protection for Leeds.

The scheme will involve raised flood defences in the city centre of Leeds, combined with an integrated catchment management approach, including engineered and natural flood management measures across the entire catchment. Full advantage will be taken of new opportunities for improving flood protection, including the South Bank Master Plan (Europe's largest regeneration area with the potential to create 35,000 new jobs and 4,000 new homes), HS2, which will link into Leeds central train station and the redevelopment of the A65 Kirkstall corridor and its possible interface with Network Rail infrastructure.

Given these new opportunities, the level of redevelopment in Leeds City Centre over the last few years, and the need to update modelling in line with the National Flood Resilience Review to reflect a more challenging climate, new plans are needed to improve flood protection in Leeds.

Engineered options to be investigated will include: raised walls, embankments, flood storage areas, conveyance improvements (including alterations to bridges, weirs and culverts), bypass channels and overland flow routes. Natural flood management measures aim to work with natural processes, features and characteristics to manage the sources and pathways of flood water. Measures to be explored further will include such things as storage in the upper catchment, tree and hedgerow planting, woody debris dams, land use and drainage.

To provide the necessary reduction in flood risk it is likely some raised defences will be required from Newlay downstream to Leeds central train station. The extent, height and appearance of these defences will be determined, and consulted upon, as the business case is developed and will depend on other viable measures to reduce flood risk.

Although further work will be needed to determine the details of this scheme and the associated standard of protection, the estimated cost is £65 million. The funding for the core scheme will be provided by Government, but further local funding would be needed for any enhancements that are not required to bring the city up to a good standard of flood protection.

Programme

The indicative programme below outlines the key activities for reducing flood risk in Leeds and anticipated timescales for delivery.

Task Name	2016/17	2017/18	2018/19	2019/20	2019/20	2020/21
Leeds FAS current works						
<i>City centre walls</i>						
<i>Crown Point Weir</i>						
<i>Knoastrop Weir</i>						
<i>Knoastrop Cut</i>						
Leeds FAS future works						
<i>Procurement & Contract Award (Appraisal)</i>						
<i>Feasibility & Business Case Approval</i>						
<i>Site Investigation & Outline Design</i>						
<i>Consultation & Planning</i>						
<i>Procurement & Contract Award (Construction)</i>						
<i>Detailed Design/Construction</i>						
Aire Catchment Partnership						
<i>Establish Catchment Partnership</i>						
<i>Develop Aire Catchment Plan</i>						
<i>Commission Initial Assessments</i>						
<i>Investigate and deliver NFM measures</i>						

The immediate priority in the coming months will be to tender and procure a suitable construction and consultant team to progress the appraisal stage of Leeds FAS future works. Tender documents have already been drafted and, subject to approval by Leeds City Council, it is expected they will be issued in the coming weeks with the contract for the appraisal work awarded early summer 2016.

Over the next 18-24 months feasibility work will be completed to explore options for improving flood protection for Leeds, and to finalise the details of the scheme. As part of this, a full business case for further reducing flood risk in Leeds will be completed. The business case will establish the appropriate standard of protection for Leeds, the measures needed to achieve this, how much it will cost and how long it will take to deliver. The programme for this work will be informed by the successful supplier - it is expected to be submitted and approved by Autumn 2017. Following approval of the business case a construction contract will be awarded by the end of 2017.

The phasing and timing of the construction work will be determined by the successful contractor, but it is expected work will commence immediately on finalising detail design, mobilisation and construction of any engineered elements.

Prior to 2021 significant progress will be made to reduce flood risk to the city centre and Kirkstall Road through the construction of raised defences and other engineered measures. These works may extend beyond 2021, along with other catchment wide initiatives and a long term programme of natural flood management measures.

It should also be noted everything possible will be done to accelerate all elements of the scheme and where opportunities present themselves to deliver individual elements early these will be taken.

Next steps

The details below set out the key areas to be investigated as part of the feasibility study and development of a business case over the next 18-24 months.

1. Build on relevant previous studies and information relating to the area - so the project can draw on previous work to find efficiencies and target where additional studies and investigations are needed.
2. Develop existing hydraulic and hydrological models alongside data collected after the Boxing Day event to inform options appraisal, fully assessing the extent of the proposed scheme area.
3. Investigate opportunities for using informal and formal flood storage within the city boundaries, linking in to master planning (HS2, South Bank, A65 Corridor), development sites and existing flood plain, also link this to integrating planned and potential interventions in the built environment.
4. Investigate storage options and natural flood risk measures (run-off reduction, sediment control and landscape management) in the upper reaches of the catchment outside of the Leeds boundary.
5. Ensure any future work to reduce flood risk is compatible with ongoing Leeds FAS work, downstream communities and other infrastructure e.g. highway drainage, sewer network and canals
6. Develop and implement a funding strategy for both the capital investment and long term maintenance of new assets, taking into account an integrated catchment approach. This will include levy based funding and engagement with third sector organisations.
7. Develop the initial strategy for operation and maintenance of the scheme and integration with how the EA warns and informs the local area.
8. Develop a catchment partnership approach to reducing flood risk in Leeds and the River Aire Catchment. Early engagement with communities and stakeholders will be essential.

Governance

The Environment Agency will continue to provide a strategic overview of flood and coastal risk. As such the Environment Agency will establish and chair a Catchment Partnership for the River Aire. This will raise awareness of flood risk, increase resilience and reduce the risk of flooding where possible along the entire river corridor taking an integrated catchment approach. The group will produce the framework and context for the more detailed, local works in Leeds and other communities to reduce flood risk.

It is proposed, in partnership with the Environment Agency, Leeds City Council will lead on the feasibility work to further reduce flood risk to Leeds city centre up to, and including, contract award. This will build on the existing governance structure of the current Leeds FAS work, which is led by Leeds City Council and chaired by their Director of City Development with support from the Environment Agency and other partners.

Procurement

The Environment Agency and Leeds City Council have considered various procurement options to deliver the appraisal work and have identified the Environment Agency's Water & Environmental Management Framework as the preferred option. Following the success of the integrated construction and consultant team on the current Leeds FAS contract, the preference is to seek to engage a supplier team from Lot 4 – Asset Delivery. This will enable valuable input to be gained from the contractor partner in the development of the most cost effective solution.

Framework for action

A Catchment Partnership will be established by the Environment Agency to raise awareness of flood risk, increase resilience and reduce the risk of flooding where possible along the entire river corridor taking an integrated catchment approach. The partnership will identify and lead key work streams in developing flood alleviation and national flood risk management opportunities.

Subject to approval by Leeds City Council they will, with support from the Environment Agency and other partners, progress appraisal work, consultation, outline design and procurement to further reduce the risk of flooding to Leeds city centre and Kirkstall Road area.