



Belfast Tidal Flood Alleviation Scheme

Information Pack

2019



Department for

Infrastructure

An Roinn

Bonneagair

www.infrastructure-ni.gov.uk

SCHEME SUMMARY

Introduction

The Department for Infrastructure Rivers is undertaking a scheme of works that will provide a long-term approach to flooding from the sea in Belfast.

Why are we doing it?

The highest sea levels recorded within Belfast Harbour have occurred within the past 20 years, with the most recent significant event in early January 2014. A study of the flood risk has estimated that some 560 residential and 460 non-residential properties are currently at risk of tidal flooding. This study has further concluded that the impact of climate change, causing sea level rise, will significantly increase the estimated number of properties at risk.

What we are doing?

The proposed scheme extends from Belfast Harbour to Stranmillis Weir and will comprise a number of different forms of both permanent and temporary flood defences. The line and type of these flood defences varies and will be subject to negotiations with a range of stakeholders as well as landowners such as Belfast City Council, the Department for Communities and the Belfast Harbour Commissioners along with private landowners. The height of the defences will also vary in relation to the surrounding ground level but will be of a consistent level in relation to the height above average sea level (Ordnance Datum).

When we are doing it?

The outline design of the scheme will be completed in spring 2019 with the appointment of a contractor to finalise the design and undertake construction in summer 2019. It is anticipated construction will commence in winter 2019/20 with completion the following winter 2020/21.

How may the scheme impact upon you?

If you live or work within the predicted flooded area you will directly benefit from the enhanced flood protection of the completed scheme.

If you are a landowner or occupier along the river you may be impacted by the construction of the flood defence within or adjacent to your property. If this is the case, we will discuss with you any works that may be required to ensure that you continue to benefit from the use of your property. Considerable discussions with landowners and occupiers of land along the river corridor have already taken place and these will continue as the scheme progresses from outline to detailed design.

The social, economic and environmental value of the river environment for the citizens of Belfast is well recognised. Consequently, it is a key part of the scheme to consult with stakeholders and undertake public consultation to ensure that the scheme meets the city's needs and opportunities to integrate the project with other developments along the river are realised.

The scheme was displayed for public comment from 14 August to 14 September 2018 and considerable engagement with stakeholders continues to further refine the outline design.

What happens next?

Extensive consultation with stakeholders has enabled the outline design of the scheme to meet the cities needs while delivering a high standard of flood protection from the sea. Open Public Sessions will display the outline scheme design to further inform users of the river corridor and further refine the design.

Discussions with landowners and occupiers are well advanced and lands agreements in principle have been drafted reflecting these discussions. These agreements in principle will be used by the Design and Build Contractor to undertake the detailed design and take the needs of landowners into account during construction.

If you want to find out more?

If you wish to find out more see the contact details at back of this pack.

INTRODUCTION

The Department for Infrastructure Rivers is undertaking a scheme of works that will provide a long-term approach to flooding from the sea in Belfast. The engineering consultancy, Atkins, has been appointed to undertake the outline design, procurement of a “Design and Build” Contractor and management of the construction process.

The principal aim of the Belfast Tidal Flood Alleviation Scheme is to identify a scheme of works that will provide a long-term approach to flooding from the sea in Belfast and to mitigate against future sea level rise caused by climate change.

Due to the location of the scheme it is intended that the final solution is of a high quality which will aesthetically integrate with, and build upon existing or proposed streetscapes and landscapes. These quality streetscapes and landscapes have been developed as part of the regeneration of Belfast to contribute positively to the economic, environmental and social vitality of the city.

WHY IS THE SCHEME NEEDED?

The highest tidal surges recorded within Belfast Harbour have occurred within the past 20 years, most recently in early January 2014. This “near miss” flooding event, concerns over the numbers of “near misses” within a relatively short time period (the 5 highest tidal surges have been recorded since 1994), and the opportunity to build in a “flood risk element” to the York Street Interchange project are reasons why the Belfast Tidal flood risk study was commissioned by DfI Rivers.



Photo courtesy of Photo © Albert Bridge (cc-by-sa/2.0)

Sandbags placed to prevent tidal flooding in January 2014

As a result of this study it is predicted that an extreme tidal flood event would cause serious disruption to commerce, the transportation network, and the social fabric of the city with some 560 residential and 460 non-residential properties currently estimated to be at risk of tidal flooding. The impact of climate change causing sea level rise will increase the number of properties at risk to over 3400 (some 2640 Residential and 770 Commercial) by 2065 and over 7900 (some 6050 Residential and 1860 Commercial) by 2115.

It is worth noting that a scheme was recently completed on the Connswater River to provide an enhanced degree of river flood protection for the Sydenham area of East Belfast.



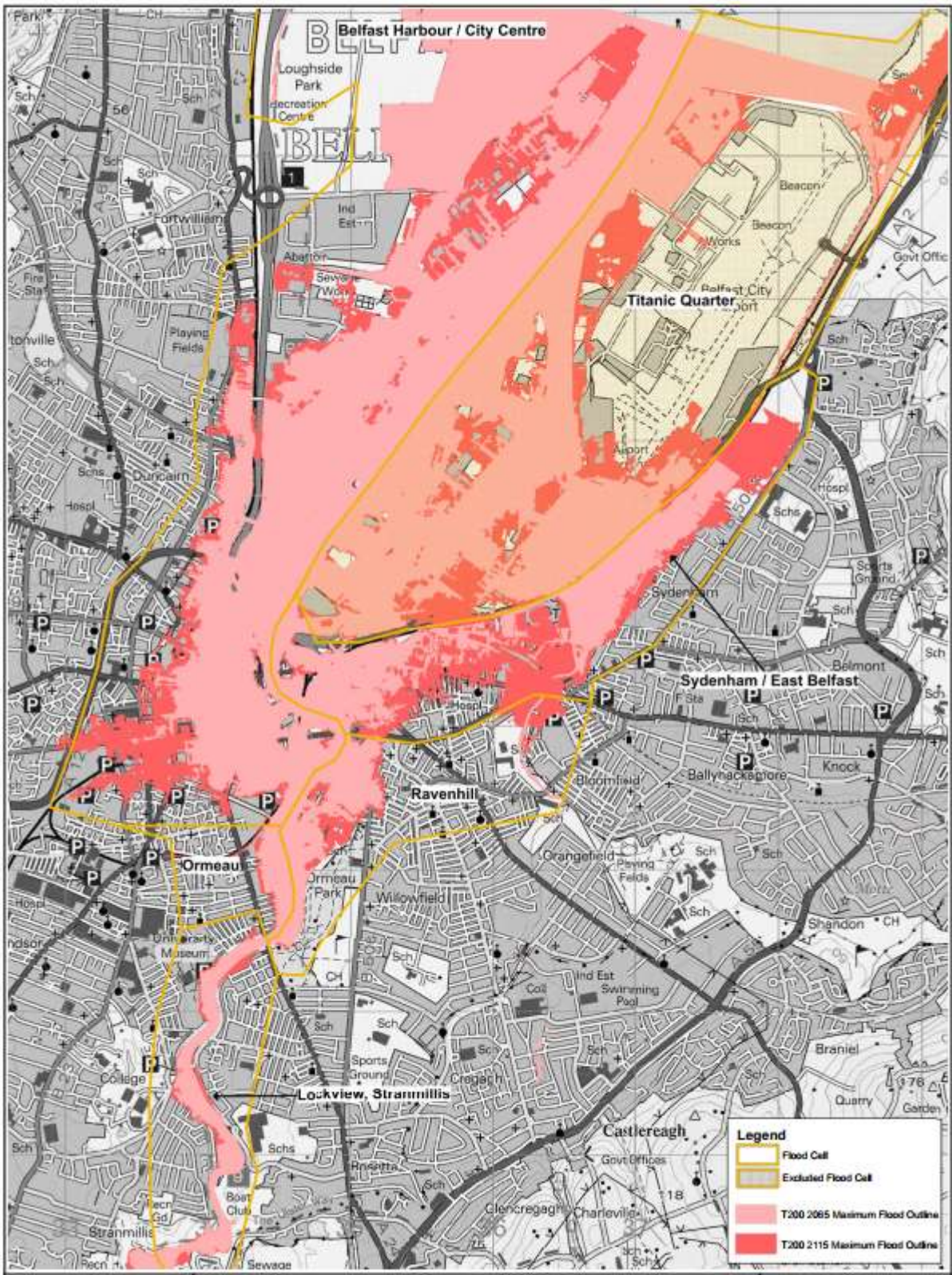
Photo courtesy of Photo © Albert Bridge (cc-by-sa/2.0)

Flood barrier in place at the underpass to Victoria Park in January 2014

An extreme event would cause serious disruption to commerce, the transportation network, and the social fabric of the city. Much of the centre of Belfast is between 1m to 2m below extreme sea levels. Any significant depth of tidal flooding within the city centre is likely to drain slowly as the drainage network capacity is exceeded. This also raises the likelihood of contamination as tidal flooding overwhelms and mixes with the foul sewerage system. Flooding of the city centre may cause major disruption for several days or weeks, with increased clean-up and recovery consequences.

Flooding to the city centre in a 1 in 200 year event is estimated to affect an area in excess of 2km² and will extend to the west as far as York Street, City Hall, and Adelaide Street and as far south as Ormeau Avenue.

The following map shows the predicted flooding extent in 2065 and 2115.



*Predicted Flood Extent in 2065 and 2015
and flood cells*

SCHEME DETAILS

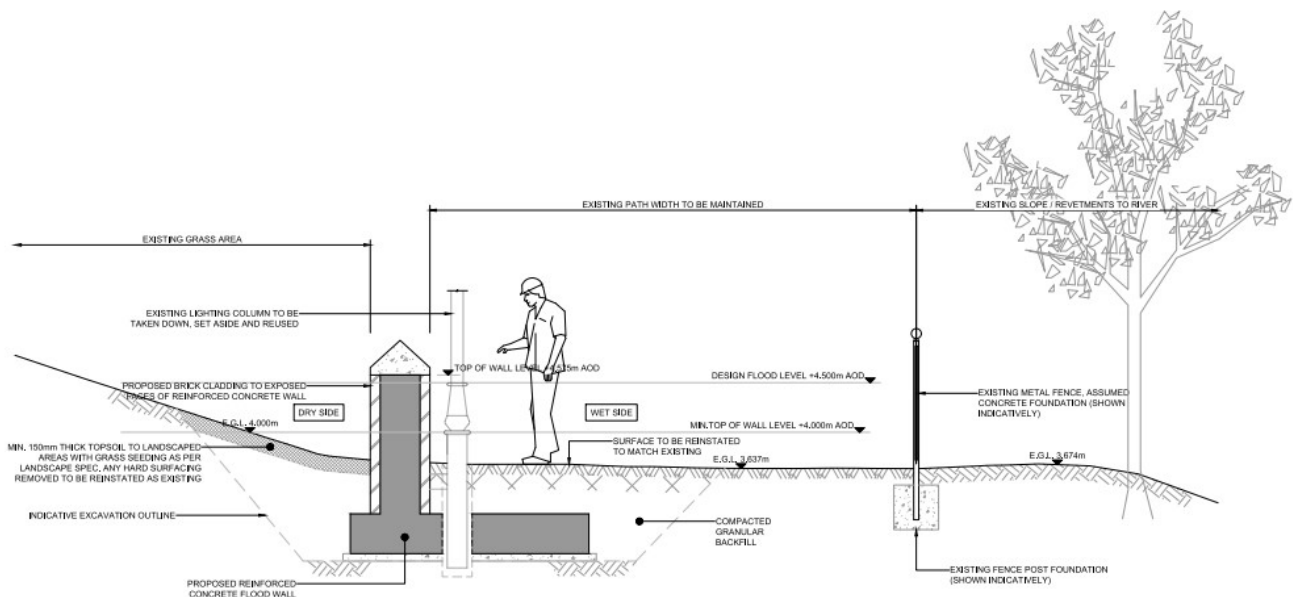
The proposed scheme extends from Belfast Harbour to Stranmillis Weir and will comprise a number of different forms of both permanent and temporary flood defences.

The line and type of these flood defences varies and has been developed in consultation with a range of stakeholders as well as landowners such as Belfast City Council, the Department for Communities and the Belfast Harbour Commissioners along with private landowners. The height of the defences will also vary in relation to the surrounding ground level but will be of a consistent level in relation to the height above average sea level (Ordnance Datum).

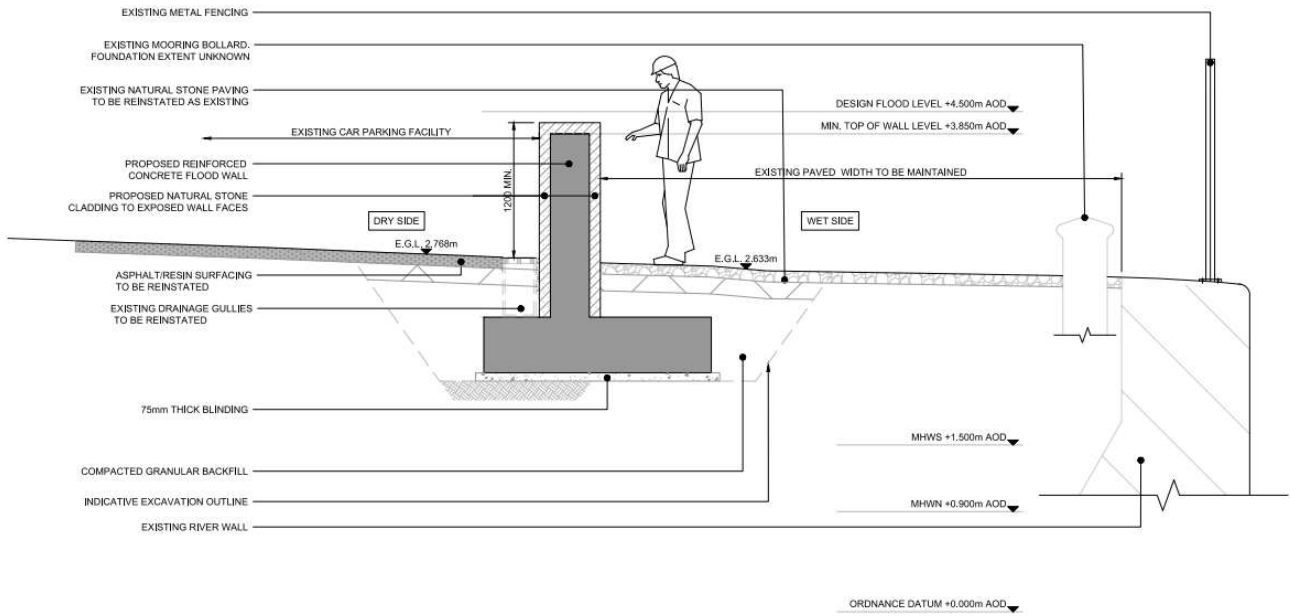
Line of flood defences

The line, height and type of the flood defence varies along the river. Defences are only provided where river bank levels are below the predicted high tide levels. Along many of the riverside walks through the city, the floodwall will be situated at the river's edge, while in other locations it will be situated at the back of the footpath. In the city centre, along some parts of the river's edge, it is proposed to install a glass flood walls which would be at a height to form a safety barrier.

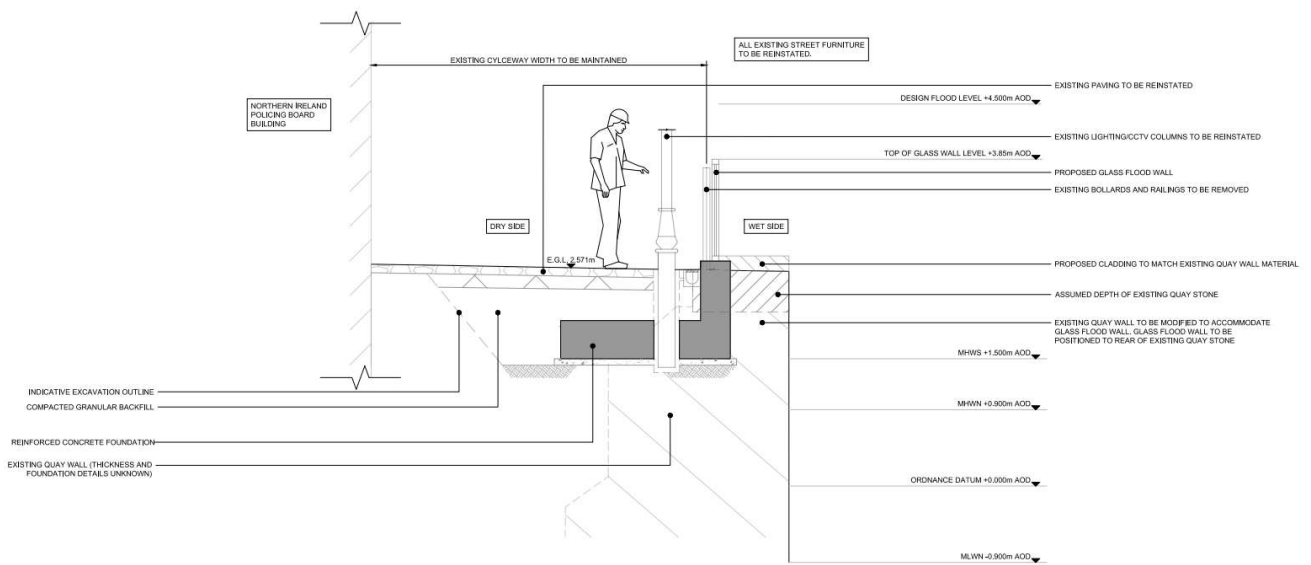
The section below at Ormeau shows the proposed floodwall at the back of the footpath.



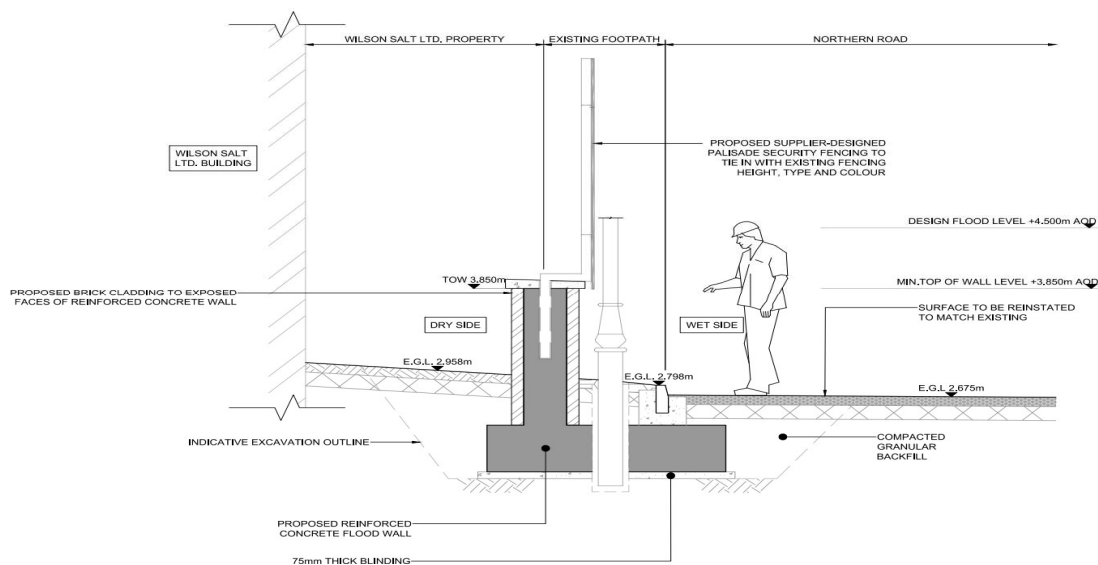
The section below at shows the proposed floodwall near the Lagan Weir.



The section below at shows the proposed floodwall at Clarendon Dock.



The section below at shows the proposed floodwall at Northern Road.



Detailed maps showing the line of the flood defences can be viewed on the Department's website using the attached link, or copies can be provided by using the contact details at the end of this pack.

Types of floodwall

The type of the flood defence will vary along the river. The image below is an example of a glass floodwall.



Photo courtesy of Flood Control International Ltd

Example of a glass flood wall

Along the back of the river walkway the flood wall replaces existing boundary walls and fences. The concrete floodwall will be finished to match the local environment. In many areas surrounding buildings are predominately brick and the image below is an example of a brick clad floodwall.



Example of a brick clad floodwall

Maintaining access to the river is particularly important which will require openings through the floodwalls. In the event of the risk of flooding these openings will be sealed with flood gates where the width of the opening is relatively narrow. The image below shows an open floodgate allowing access to the riverside walk.

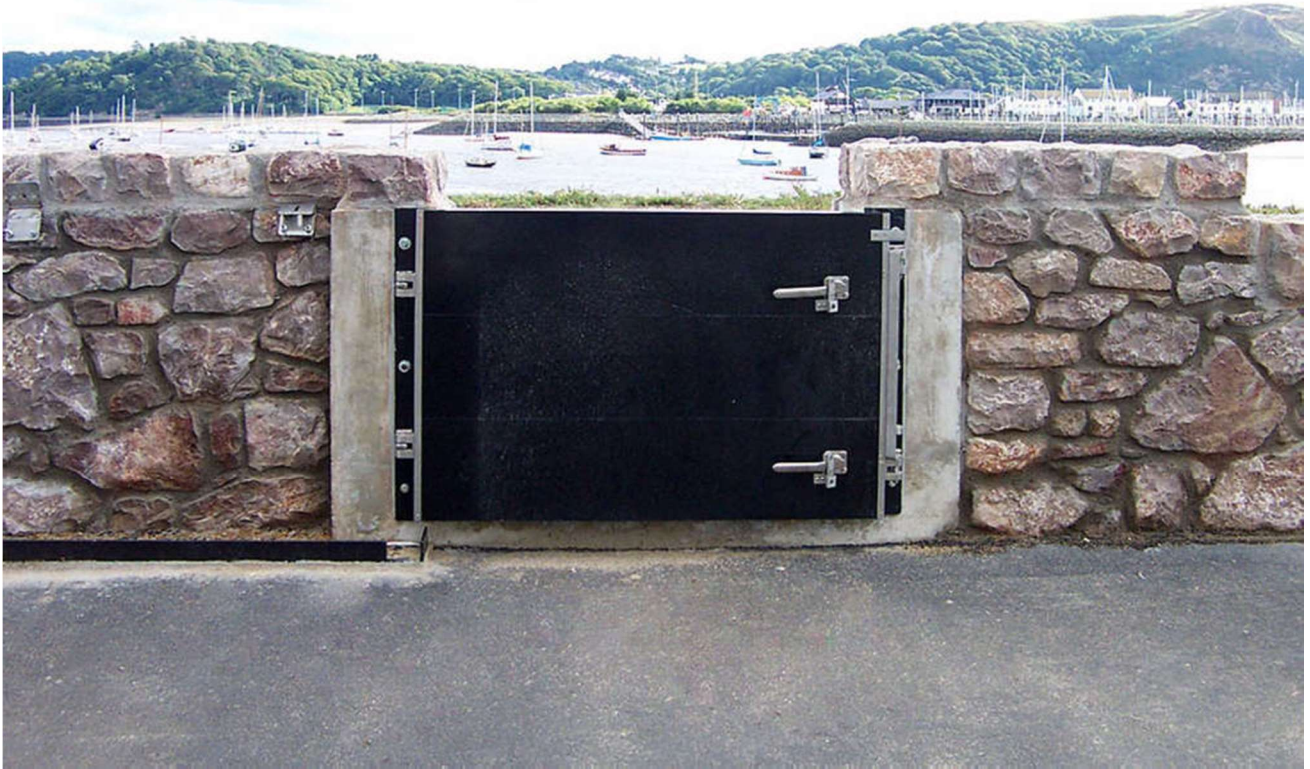


Photo courtesy of Flood Control International Ltd

Example of an in-situ floodgate

Where an opening in the floodwall is relatively wide, for example, where the floodwall crosses a road, then a demountable barrier may be used. This comprises posts which fit into sockets built into the road. Aluminium planks then span between the posts to form the floodwall. The image below shows the demountable barrier in place which is done when there is a risk of flooding.



Photo courtesy of Flood Control International Ltd

Example of a demountable barrier

Property level protection is used where a wall may not be appropriate and includes sealing openings to keep flood water from entering property. The image below shows a protection at a doorway.

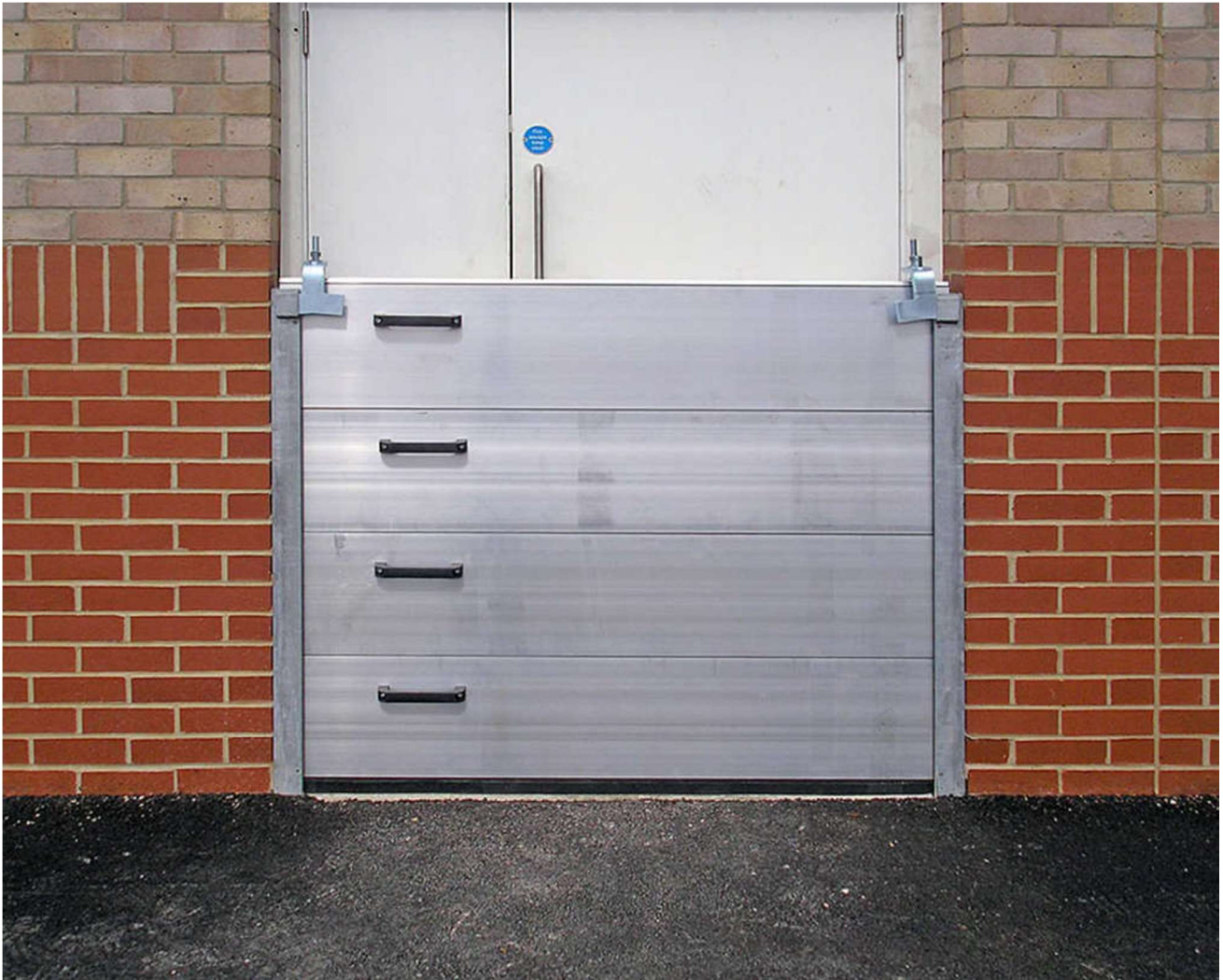


Photo courtesy of Flood Control International Ltd

Example of property level protection

Flood Cells

The areas through the city subject to flooding have been divided into 6 distinct flood cells as shown on the map in page 7.

Harbour and City Centre Flood Cell

This flood cell covers the harbour area and the city centre. The route through the harbour operational area is under review with Belfast Harbour Commissioners

Discussions are well advanced with Belfast City Council and the Department or Communities regarding the proposals along the river frontage at the Lagan Weir and the Waterfront Hall.

The flood defences within this flood cell also interact with the York Street Interchange Project and care is being taken to ensure that both projects are coordinated.

Sydenham and East Belfast Flood Cell

This flood cell extends along the eastern side of the river from the SSE Arena to East Bridge Street with the outline design proposing the line of the flood wall largely situated along the river frontage. Discussions regarding the line and type of defence are ongoing with the Department for Communities are well advanced.

Ormeau Flood Cell

This flood cell extends from East Bridge Street to the Ormeau Bridge on the Ormeau Road side of the river. It is proposed to provide a solid flood wall with a number of gated openings to provide access to the riverside walkway. Discussions are ongoing with landowners are well advances.

Ravenhill Flood Cell

This flood cell extends along the Ravenhill side of the river from East Bridge Street to Ormeau Bridge. In discussion with the Department for Communities, it is proposed to situate the flood wall along the back of the riverside walkway, with floodgates to provide access to the river. At the lower end of the Ravenhill Road there are a number of commercial properties backing onto the river. It is proposed to provide a mixture of floodwalls and property level protection at this location.

Lockview and Stranmillis Flood Cell

This flood cell extends from the Ormeau Bridge to Stranmillis Weir. From Ormeau Bridge to Governors Bridge the current proposal is to situate the flood defence along the back of the footpath. From Governors Bridge to Stranmillis Weir only the Lockview Road side of the river is at risk and it is proposed to provide flood walls along the back of the riverside walkway. Further along Lockview Road it is proposed to provide a mixture of flood walls and property level protection because of the recreational use made of the river at this location.

Titanic Quarter Flood Cell

This flood cell covers the Titanic Quarter and is not part of this current scheme. A separate study will consider the flood risk in this cell and determine if an intervention is required.

WHEN WILL THE SCHEME BE UNDERTAKEN?

The outline design of the scheme is largely complete. It is anticipated that a design and build contractor will be appointed this summer. It is anticipated construction will commence in winter 2019/20, with completion the following winter 2020/21. It is recognised that this is a challenging timescale.

Action	Date
Stakeholder and landowner engagement	Ongoing
Complete Outline Design	Spring 2019
Appoint Design & Build Contractor	Summer 2019
Commencement of Site Works	Winter 2019/20
Completion of Site Works	Winter 2020/21

CONSULTATION WITH STAKEHOLDERS

Those who live or work within the predicted flooded area will directly benefit from the enhanced flood protection of the completed scheme.

Landowners or occupiers along the river may be impacted by the construction of the flood defence within or adjacent to their property. If this is the case, we will discuss with them the proposed works and how we can minimise disruption to ensure that they continue to benefit from the use of their property.

The social, economic and environmental value of the river environment for the citizens of Belfast is well recognised. Consequently, it is a key part of the scheme to consult with stakeholders and undertake public consultation to ensure that the scheme meets the city's needs and opportunities to integrate the project with other developments along the river are realised.

Due to the location of the scheme it is intended that a high-quality solution is delivered which will aesthetically integrate with, and build upon any existing or proposed streetscapes and landscapes where they are situated. These quality streetscapes and landscapes have been developed as part of the regeneration of Belfast to contribute positively to the economic, environmental and social vitality of the city.

The key stakeholders identified to date include:

- Department for Infrastructure, Roads & Rivers
- York Street Interchange Project Team
- Department for Communities
- Central Procurement Directorate
- Belfast Harbour Commissioners
- Belfast City Council
- Belfast City Centre Management Company
- Belfast Chamber of Commerce
- Belfast Community Planning
- Department of Justice Northern Ireland
- Planning NI
- PSNI
- Belfast Harbour Police
- Maritime & Coastguard Agency
- NIFRS
- Lagan Weir
- Belfast Waterfront and Ulster Hall Ltd
- Political Representatives
- NI Water
- NIEA (Water Management Unit, Built Heritage, Natural Heritage, Conservation Designation & Protection, Marine Division, Protecting Landscapes)
- British Telecom

- NIE
- Phoenix Gas
- Translink
- RSPB
- Ulster Wildlife Trust
- DSD
- DAERA Sea Fisheries
- DCAL Inland Fisheries
- AFBI NI
- Belfast Lough & Lagan Catchment Stakeholder Group
- East Belfast Coarse Angling Club
- Stranmillis Boat Clubs
- Cutters Wharf
- Other local businesses

Other stakeholders may be identified during the course of the scheme including riparian landowners, residents near the proposed works and neighbouring businesses. The overall objective is to have an inclusive engagement process.

Discussions with key stakeholders and landowners, including Belfast City Council, are well advanced. This engagement will continue through the detailed design and construction phases of the scheme.

CONTACT DETAILS

If you wish to find out more at this stage please contact:

DfI Rivers Headquarters

DfI Rivers HQ
49 Tullywiggan Road
Loughry
Cookstown
BT80 8SG

Telephone: 028 8676 8300

Email: rivers.registry@infrastructure-ni.gov.uk



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