

Board 1: An Introduction to the Public Exhibition

Introduction

Welcome to this second public exhibition event for the proposed Newton Stewart Flood Protection Scheme.

The aims of this event are to:

- Provide information on flood risk within the town;
- Outline the proposals by the Council for a flood scheme;
- Explain the process by which the flood scheme design is progressing;
- Give an opportunity for you to ask any questions to those involved in the scheme design; and
- Gather information on public opinion regarding the scheme progression

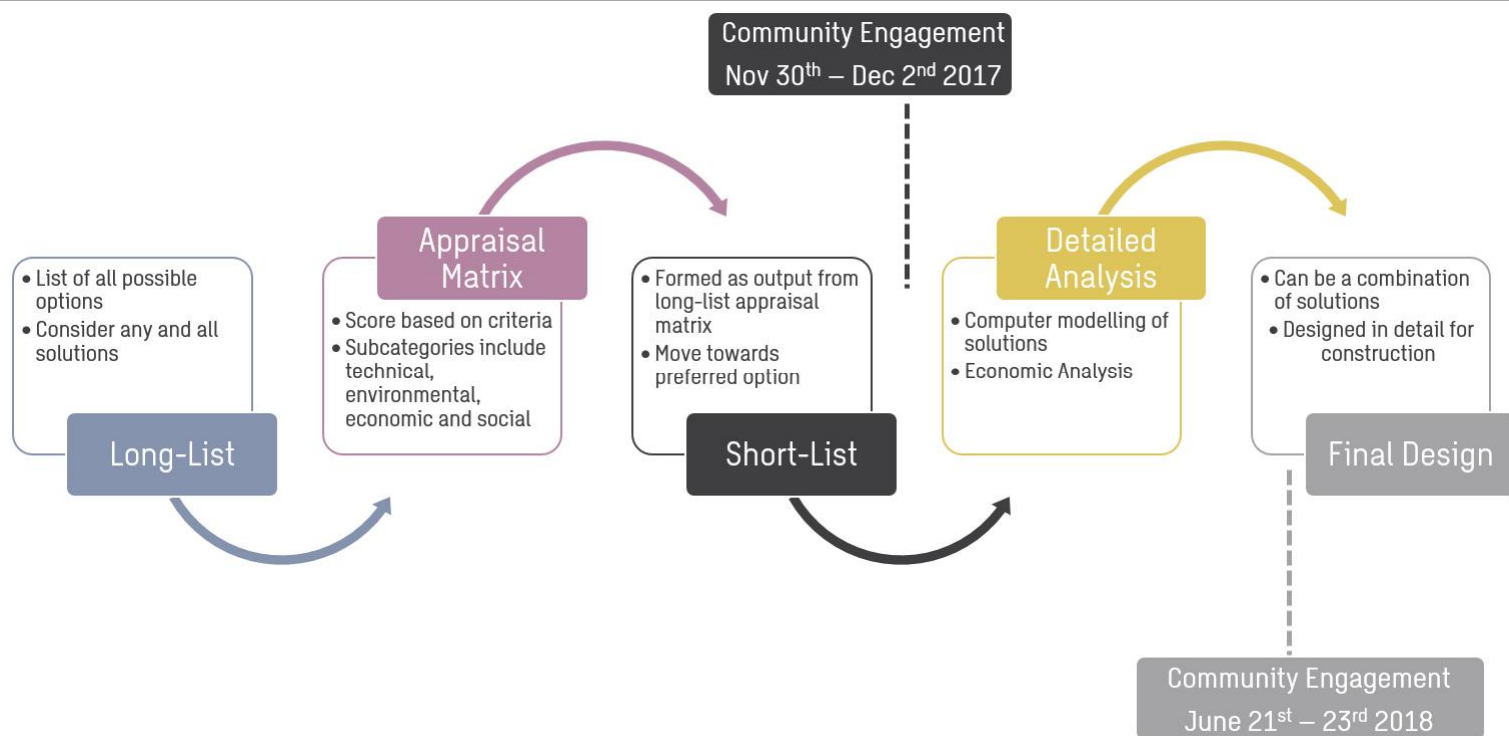
Public Exhibition

The flow chart below describes the process of designing the flood protection scheme.

The boards provide information on the process leading to, and justification of any decision.

There will be opportunity to leave your comments for consideration in the next stage of the design process.

If you have any questions, please speak to a representative from the design team, who are available throughout the exhibition.



Outline of Display

The information being displayed is as follows:

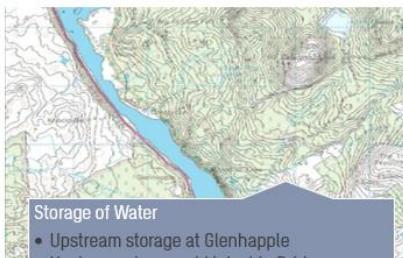
- Board 2 – Progress to Date – Long List to Preferred Option
- Board 3 – 1:200 Year Predicted Flood Outline
- Board 4 – Outline Design Overview (1 of 2)
- Board 5 – Outline Design Overview (2 of 2)
- Board 6 – Design Constraints
- Board 7 – Embankment, Wall & Two Stage Channel Design
- Board 8 – Analysis of Secondary Flooding
- Board 9 – Analysis of Flood Risk & Cost Benefit
- Board 10 – Next Steps
- 3D Model of Flood Defence Scheme
- Sparling Bridge Update

OFFICERS ARE ON HAND FROM DUMFRIES & GALLOWAY COUNCIL AND FROM SWECO TO ANSWER ANY QUESTIONS YOU MAY HAVE

Board 2: Progress to Date – Long List to Preferred Option

Long-List Options

The Long-list comprised the ‘list of all possibilities’ – no matter how likely they were to progress.



Storage of Water

- Upstream storage at Glenhapple
- Upstream storage at Linloskin Bridge
- Upstream storage at Frankie Hill
- Upstream storage at The Ghyll
- Upstream storage in River Cree tributaries



Direct Defences



A75 Road

- Increase flow area beneath A75 bridge
- Removal of A75 embankment
- Creation of a diversion channel beneath the A75



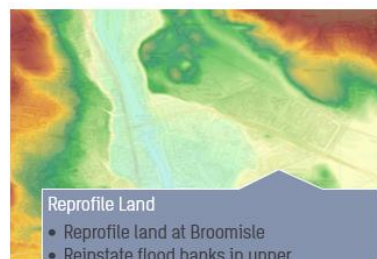
Remove Obstruction to Flow

- Removal of gravel berm
- Removal of in-line weir
- Removal of upstream weir
- Remove Mill Island
- Remove sediment build-up at structures



Modify River Channel

- Placement of obstruction (River Cree)
- Placement of obstruction (Penkiln Burn)
- Reconnect Penkiln Burn upstream
- Diversion of Penkiln Burn
- Dredge Channel
- Disconnect former mill lade



Reprofile Land

- Reprofile land at Broomisle
- Reinstatement of flood banks in upper catchment
- Reprofiling of land around pumping station
- Mitigation of forest management

All of these options were considered and narrowed down to a short list at the VM1 meeting. Several options were proven not to reduce flood risk, or unsuitable due to other constraints.

The Short List included the below options which were discounted:

<p>Installation of Obstructions on the River Cree</p> <p>Storage area was found to be significantly below what would be required to impact flooding within the town.</p>	<p>Upstream Storage at Linloskin Bridge</p> <p>Obstructions placed in river slowed flow at less intense storms, but were ineffective during extreme events.</p>	<p>Additional Flood Relief Culverts Beneath A75</p> <p>Ground levels near to the A75 embankment eliminated any impact additional culverts would provide.</p>
<p>Reinstate Storage Area at Water of Minnoch</p> <p>Storage area was found to be significantly below what would be required to impact flooding within the town.</p>	<p>Upstream Storage at The Ghyll</p> <p>Presence of former lead mine a pollution risk. High cost of relocating roads, services and property from inundated area.</p>	<p>Upstream Storage in River Cree Tributaries</p> <p>Small number of impoundments yielded no improvement. Prohibitively high number of impoundments required.</p>

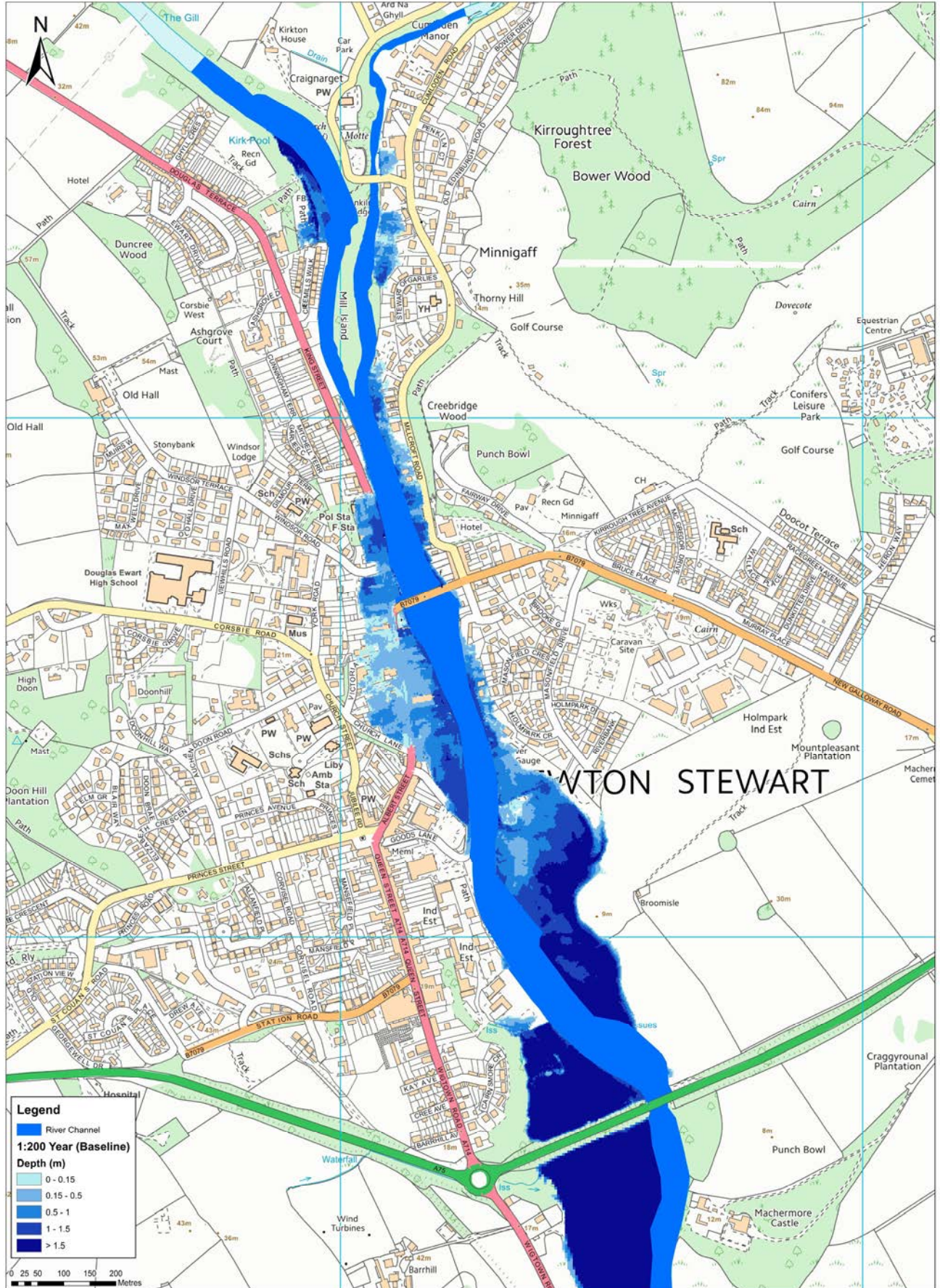
Further investigations, modelling, and public and stakeholder engagement followed, allowing the selection of a preferred option.

The Preferred Option

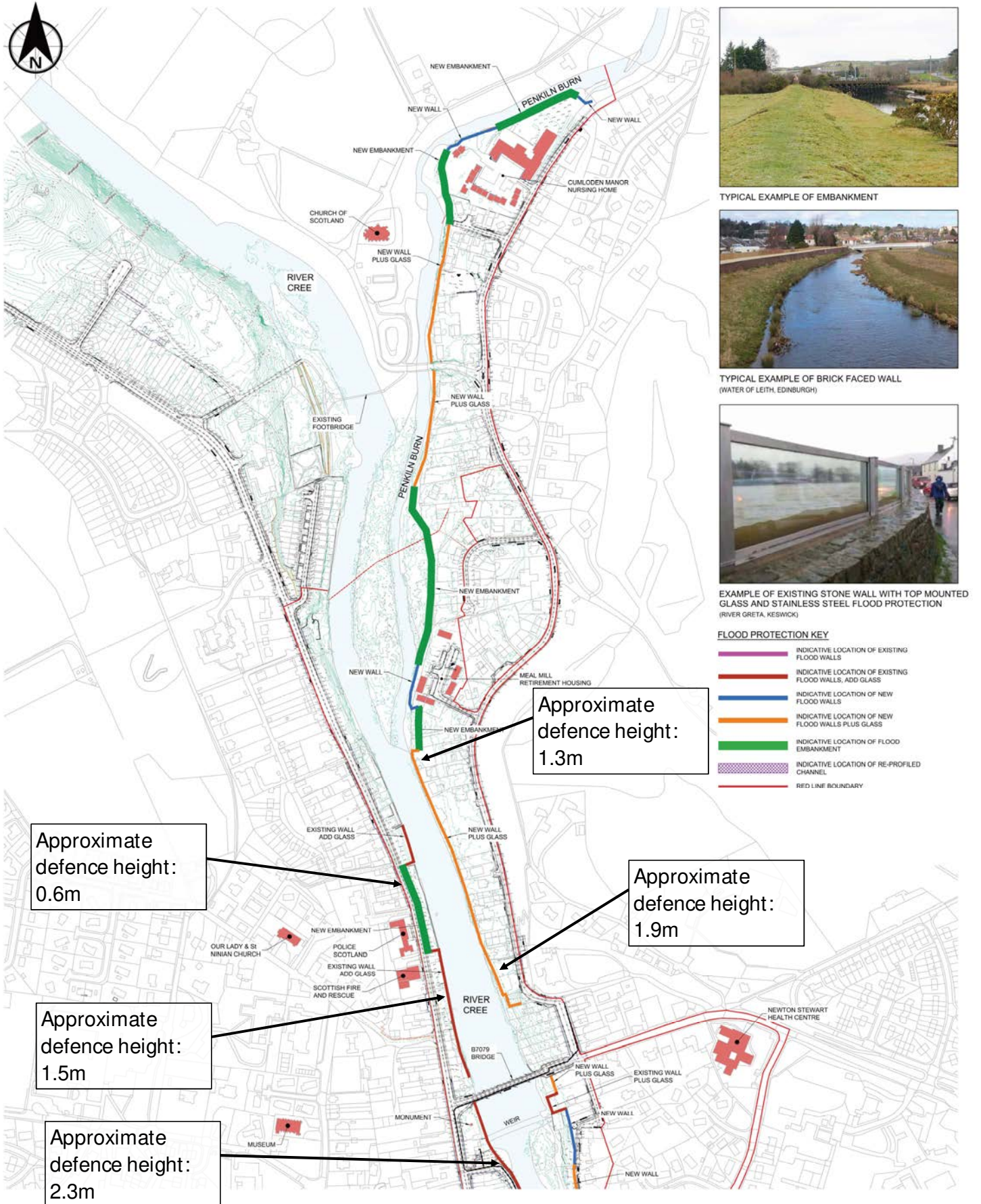
The preferred option comprises a combination of options:

- Direct defences at locations to be determined during outline design
- Increase flow area beneath A75 bridge
- Two stage channel to facilitate increased flow area, extending upstream to pumping station
- New Sparling Bridge to tie-in with the above interventions

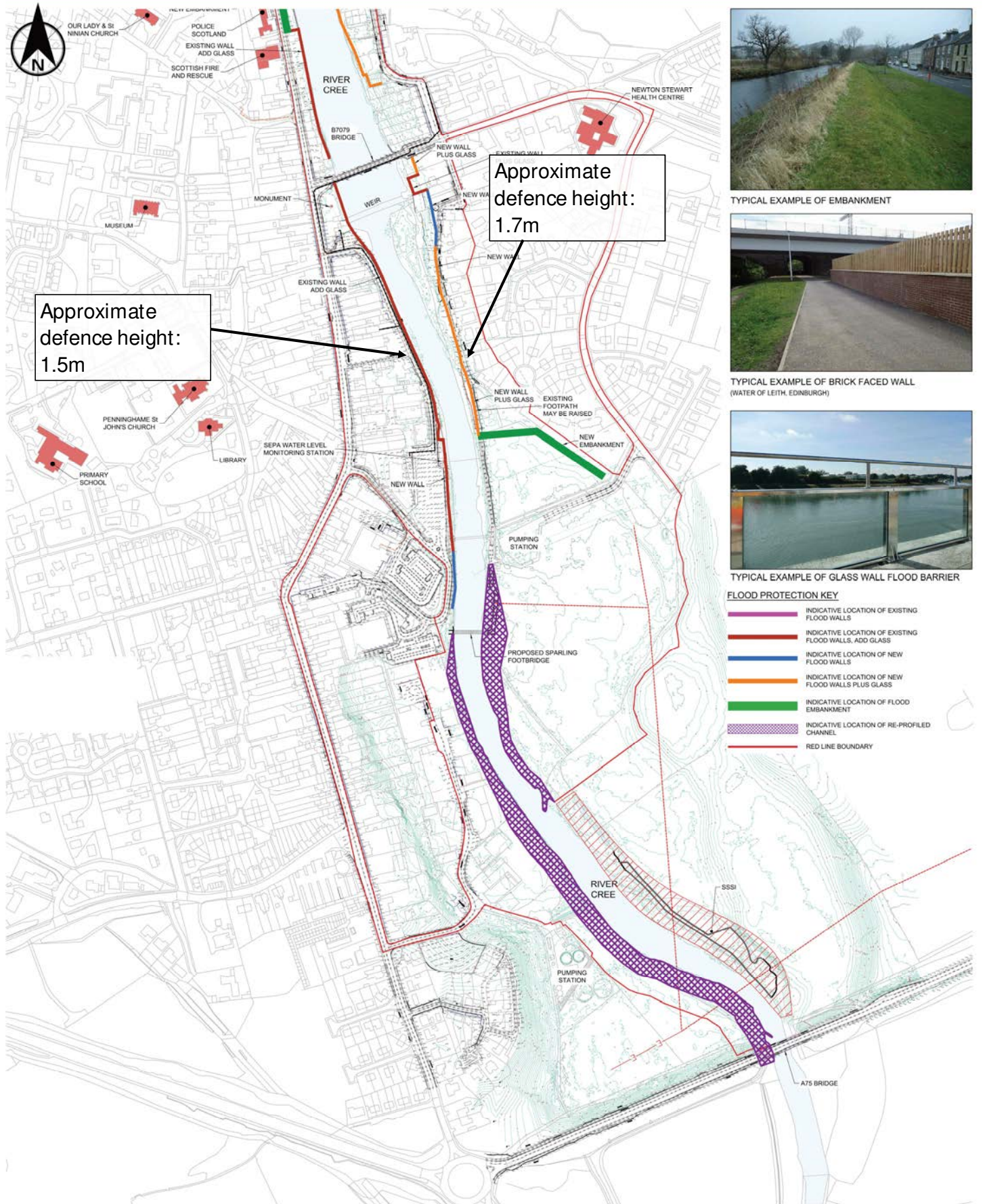
Board 3: 1:200 Year Predicted Flood Outline



Board 4: Outline Design Overview (1 of 2)



Board 5: Outline Design Overview (2 of 2)



TYPICAL EXAMPLE OF EMBANKMENT



TYPICAL EXAMPLE OF BRICK FACED WALL (WATER OF LEITH, EDINBURGH)



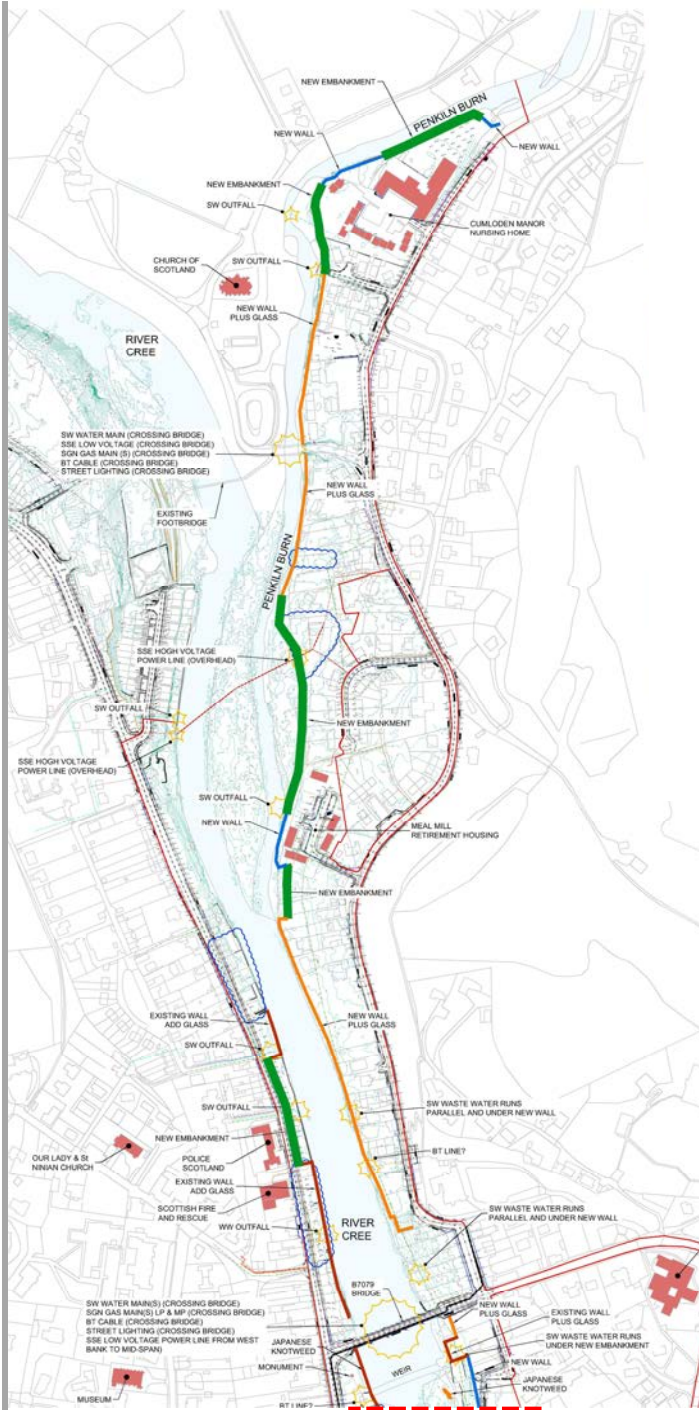
TYPICAL EXAMPLE OF GLASS WALL FLOOD BARRIER

Board 6: Design Constraints

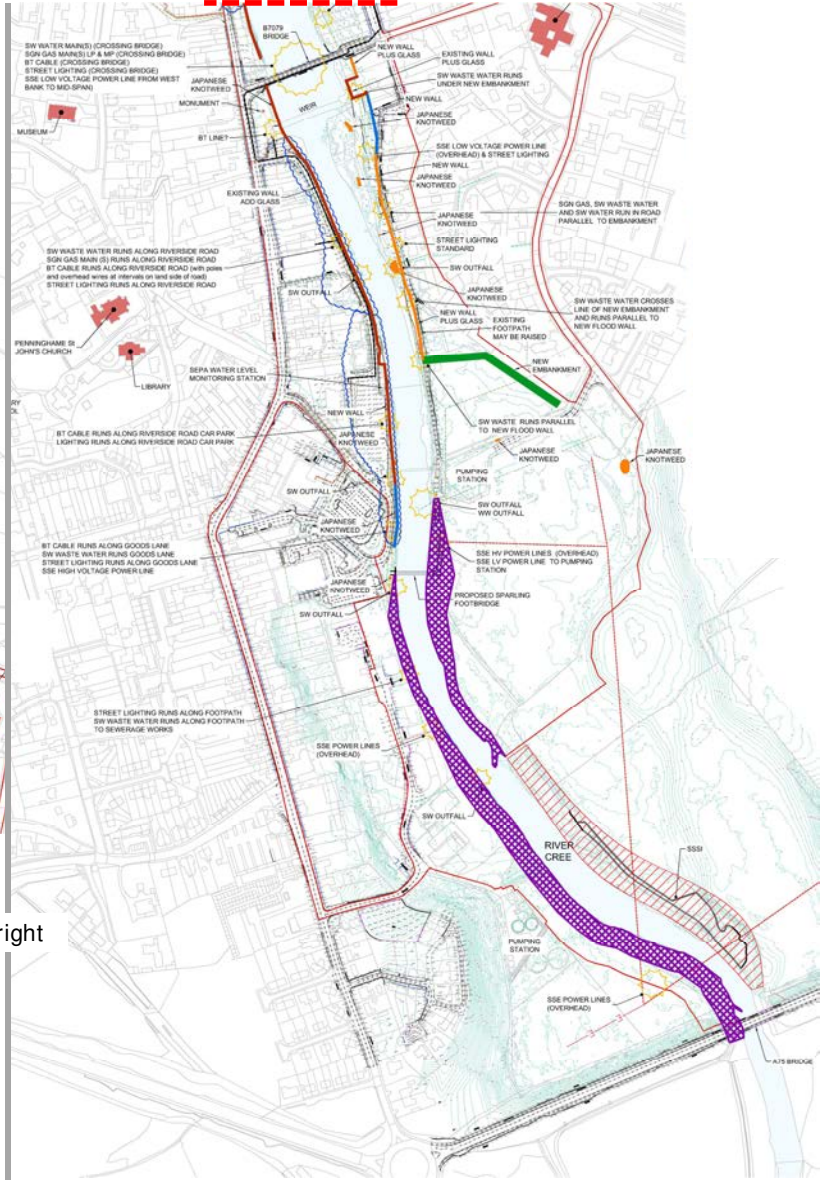
Constraints Mapping

Constraints are anything that the construction must (or, should) avoid.

These include, but are not limited to the following: public utilities, sites of environmental importance, areas where invasive plant species are present and listed structures.



See drawing to left



Key Constraints at Newton Stewart

- B7079 bridge is a listed structure;
- Japanese knotweed present at various locations; and
- SSSI (site of special scientific interest) on the River Cree relating to the Sparling fish.

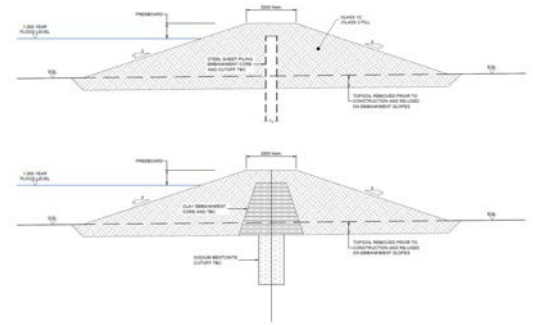
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Board 7: Embankment, Wall & Two Stage Channel Design

Embankment Design

Embankments constructed with impermeable core (to prevent water seeping through), then covered in earth to compliment surroundings.

Used as a first choice where possible, but constrained by the amount of space that may be available.



Wall Design



New walls would be constructed with reinforced concrete (to withstand forces from flood water) and then clad with masonry (for aesthetics).

Where defences are higher and may restrict views across the river, there is the potential to construct glass viewing slides at the top of the defence.



Fisherman's access to river maintained through steps up and over proposed walls.

Defences placed back from edge of river to simplify constructions.

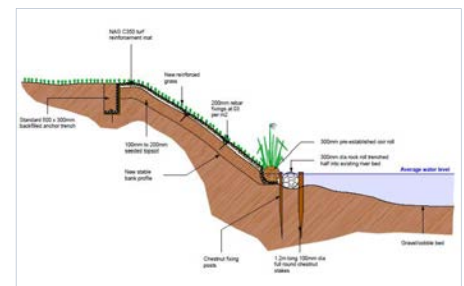
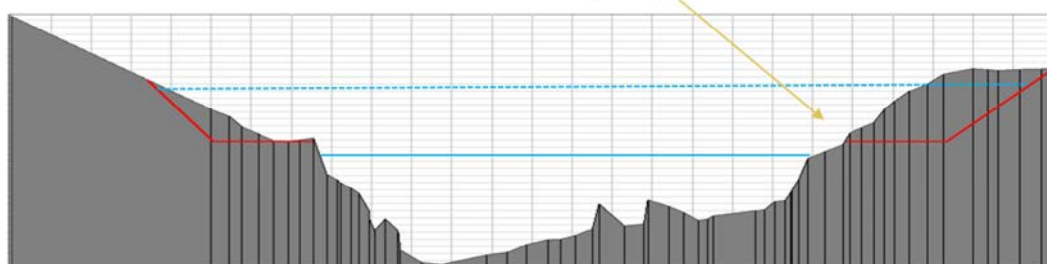
Some areas will make use of existing walls in Newton Stewart, which will be upgraded.

Two-Stage Channel Design

Lowering of ground on banks of river to provide increased capacity for flood water. This results in water being carried away from the town quicker throughout the storm, with a corresponding reduction in flood levels.

Additional potential for landscaping work to improve riverside paths and environment while two-stage channel is being designed.

Increased capacity for flood water



Board 8: Analysis of Secondary Flooding

What is Secondary Flooding?

When flood barriers (such as walls) are placed along the river, the normal drainage pathways for runoff from town will be blocked. This can cause secondary flooding.

This board shows the locations of secondary flooding as predicated by the model, and indicates how secondary flooding will be eliminated or reduced.

Cumloden Road Gardens

Secondary flooding of private gardens from road runoff and overflow from the sewers.

This will be reduced by installing tide flap valves in the flood walls in each private garden.

King Street

Secondary flooding is caused by road runoff from Kings Street. Ponding of water could flood nearby properties.

This will be eliminated by installing a new outfall pipe to drain flood water.

Arthur Street

Secondary flooding is caused by road runoff from Mitchell Terrace and Arthur Street. Ponding occurs around the CSO Chamber.

This will be reduced by installing new drainage channels and outflow pipes to drain the flood waters.

Mortons Entry

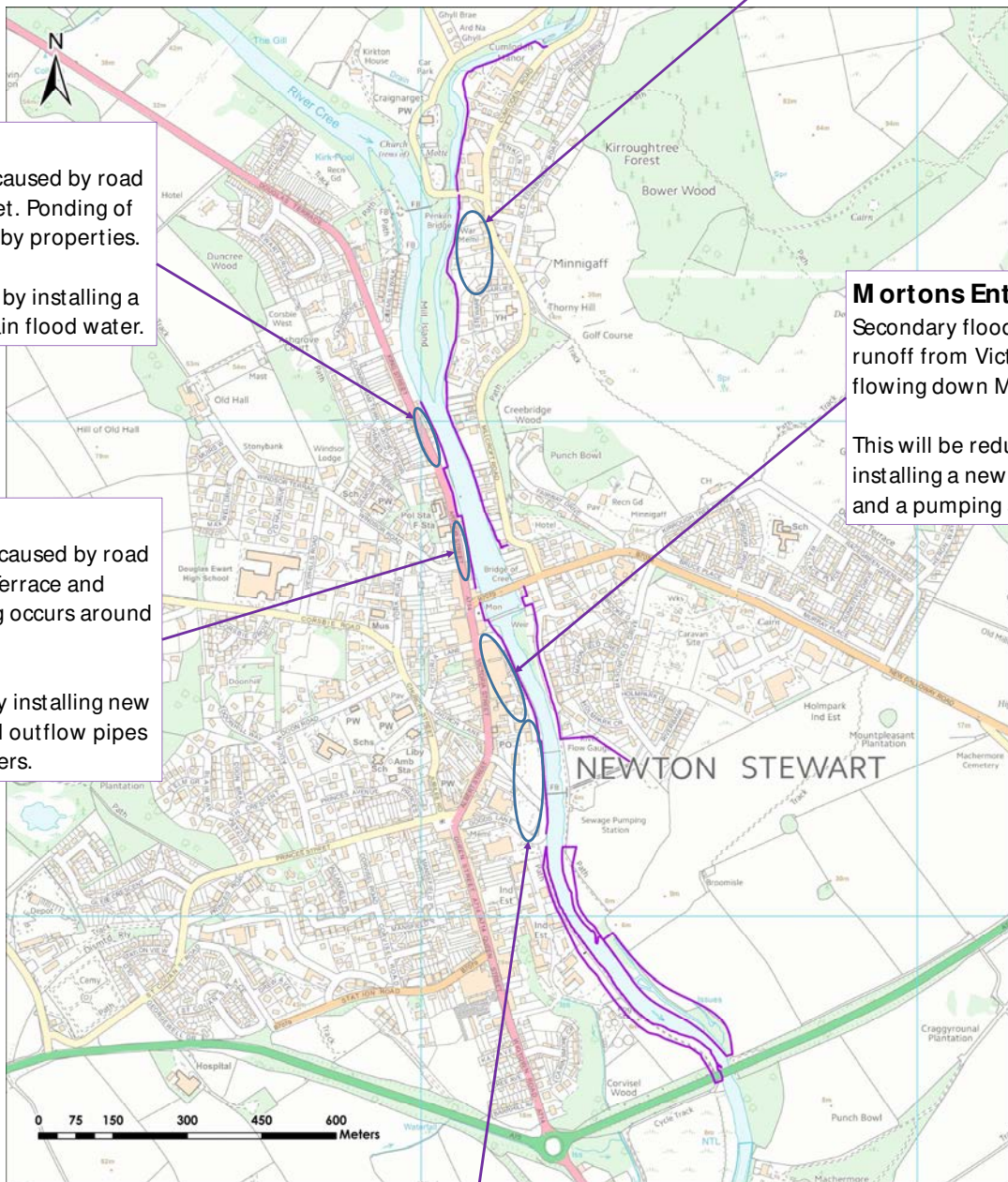
Secondary flooding from road runoff from Victoria Street flowing down Morton's entry.

This will be reduced by installing a new outfall pipe and a pumping station.

Riverside Drive

Secondary flooding is from a combination of road runoff, from Albert Street, Goods Lane and Riverside Drive, and overflow from sewers in the car park.

This will be eliminated by installing a new drainage system, a new outfall pipe, a storm water storage facility, and a pumping station.



Board 9: Analysis of Flood Risk & Cost Benefit



What is Benefit-Cost Ratio?

Damage calculations consider the following:

- Residential receptor flood damages;
- Non-residential receptor (e.g. commercial/industrial) flood damages;
- Road closure impacts on local economy;
- Cost of residential evacuation;
- Damage to vehicles;
- Emergency services costs; and
- Impacts on health.

Benefit-cost ratio (BCR) looks at the *reduction* in damages due to a defence option (i.e. the **benefit**) divided by the estimated **cost** of the work.

This provides a ratio which, if greater than 1.00, shows an option is economically viable.

As there are many uncertainties, a factor known as an **optimism bias** is applied to the calculation. At optioneering stage, this was 60% (i.e. assume everything is 60% more expensive than calculated) – but at outline design stage this figure is only 40%, to account for the increase in certainty.

Costing Details

Cost Element	Estimated Cost
Direct Defences	£5,700,000
River Reprofilng	£260,000
A75 Reprofilng	£55,000
Secondary Flooding	£850,000
Utilities Diversions	£165,000
Landscaping	£25,000
Maintenance (50 Years)	£505,000
TOTAL	£7,560,000
Add 40% Optimism Bias	£10,584,000
Add 25% On-Costs	£13,230,000
Baseline Damages	Estimated Economic Benefit
Total (PV) Benefits	£13,725,000

Overall scheme benefit-cost ratio (BCR) = 1.04

Board 10: Next Steps

Project Timeline

MARCH 2018	• Complete ground investigations and analysis report
MARCH TO MAY 2018	• Undertake and complete outline design
MAY 2018	• Value Management 3 meeting to discuss outline design and preferred option
MAY TO JULY 2018	• Further topographic surveys and Ground Investigations in <u>Minnigaff</u> area
JUNE 2018	• 2nd Public Engagement event
JULY TO SEPTEMBER 2018	• Prepare scheme drawings and documents for Flood Order
SEPTEMBER 2018	• Report to Economy, Environment and Infrastructure Committee to present finalised outline design and seek approval to formally publish the scheme
OCTOBER 2018	• Publish Flood Order
2019	• Following approval of the Flood Order, detailed design will progress with further stakeholder engagement
2020 to 2021	• Construction likely

Environmental Screening

Sweco have prepared an environmental screening request for submission to DGC Planning Service – this will determine whether an Environmental Impact Assessment is required to be submitted as part of the flood scheme documentation.

Public Exhibition Event

We hope this public exhibition has been useful, and if you have any further comments please speak to one of the project team.

If you could fill out a feedback survey before leaving, this would be much appreciated.

Further newsletters will be provided to the community to update on progress as the scheme progresses.

Any immediate queries can be made at any time by writing to Dumfries & Galloway Council.

Flood Warning Scheme

A real-time flood warning scheme is currently available in Newton Stewart, run by SEPA.

Sign up for flood warnings direct to your phone at the below address, or scan the QR code:
<http://www.floodlinescotland.org.uk/flood-warning-schemes/river-cree-flood-warning-scheme/>



Replacement Sparling Bridge

Sparling Bridge Update

The time required to undertake a tender process, appoint a contractor, and give them sufficient time to mobilise and prepare the site, would not leave a sufficient period to carry out any meaningful work before the construction period ends (the SEPA licence to work in a river environment expires at the end of September).

The decision has therefore been taken to postpone the building of the bridge until next year. It is proposed that we will proceed with appointing a contractor, with site preparation to take place in March/April 2019 enabling the main construction to commence in May 2019.

Whilst we fully appreciate that this will mean Newton Stewart will remain without a dedicated pedestrian/cycle bridge again this year we feel that this postponement will ultimately lead to the provision of a substantially improved project.

Project Improvements from a longer timespan:

- Longer lead in time allowing better planning of works.
- Likely to receive lower tender prices given less disruption/constraints.
- End product of much higher quality.
- Construction during 'best weather' months and maximise SEPA licence window.
- Additional lead in time will allow further review of the project to ensure maximum co-ordination and tie-in with the design of the main flood protection scheme.

Timeline

JUNE 2018	• Complete tender documents and drawings
JUNE 2018	• Issue PIN notice on Public Contracts Scotland to enable interested parties to express interest, visit site, consider supply chains etc
JULY 2018	• Conclude outstanding agreements.
LATE 2018/ EARLY 2019	• Issue tender
EARLY 2019	• Award contract.
MARCH/APRIL 2019	• Site set-up and initial works.
APRIL/MAY 2019	• Main work to start on site.
AUGUST 2019	• Estimated completion and opening.