

Option Description

Option A considers a mix of flood defence embankments and walls for the River Barrow and culvert upsizes at tributaries AMR4, Blackstick Drain, AMR6 and AMR13. For two of these culverts, a regrading of the section upstream and downstream is necessary to ensure sufficient depth of cover and improve conveyance. Additionally, the option includes a water retention area for the Blackstick Drain with a bypass channel.

No modifications are proposed to the existing bridges within the Scheme area (Barrow Bridge and Spa St. Bridge). The new defences are envisaged to tie in to the bridge deck and walls.

Flood gates are required at different locations along the Barrow floodplain and tributaries to maintain current access.

Flood defence heights are based on the 1%AEP event with an additional allowance typically 300mm for walls and 500mm for embankments.

The option would include the following defences divided per area.

Area	Defences	Average Heights	Total Lengths
Railway to AMR4 confluence	Embankment on the River Barrow Floodplain at the Left Bank	1.3m	290m
AMR4	Embankments and Walls on AMR4 Right Bank and River Barrow floodplain at the Right Bank	1.0m	410m
	Embankments and Walls on AMR4 Left Bank and around the Greenfield Area	2.0m	270m
	Culvert upsize to 1.20m and regrade of part of AMR4		100m (regrading)
AMR4 confluence to Barrow Bridge	Walls on River Barrow Left and Right Bank	1.8m	450m
Barrow Bridge to Spa Street Bridge	Walls on River Barrow Right Bank and Embankments and Walls along River Barrow Floodplain at the Left Bank Culvert upsize to 0.8m Height x 1.0m Width	1.2m	920m
Blackstick Drain	Water Retention Area (Wetland) with Bypass Channel from the Blackstick Drain Right Bank		18000m ² (area)
	Embankments on Blackstick Drain Floodplain behind proposed Water Retention Area	1.3m	630m
	Wall on Blackstick Drain Left Bank and Embankments on Blackstick Drain Right Bank	1.7m	885m
	Culvert upsize to 1.2m Height x 1.5m Width		
Spa Street Bridge to AMR8	Walls and Embankments on River Barrow Right Bank and on Floodplain at the Right Bank Culvert upsize to 0.8m Diameter	1.4m	530m
AMR13	Embankments and Wall around Greenfield Area	0.8m	510m
	No. 1 Culvert upsize to 1.5m Diameter; No. 1 Culvert upsize to 1m Height x 2.1m Width		200m (regrading)

Benefits	Constraints
<ul style="list-style-type: none">Option A would protect approximately 144 properties from flooding for the 1% AEP event.The option does not increase downstream flood risk.<ul style="list-style-type: none">⇒ There is potential for improvement of riparian habitats, creation of wetlands habitats, opportunities to encourage wildflowers/grasses and nesting birds at the Blackstick Drain proposed wetland.The following key transport routes are protected from the 1%AEP flooding:<ul style="list-style-type: none">⇒ Barrow Bridge and Spa Street Bridge⇒ Patrick’s Street⇒ Lea Road⇒ Portlaoise Road and Foxcroft AvenuePortarlington’s monuments are protected from the 1%AEP flooding.Portarlington’s Botley lane and Bracklone industrial estates are protected from the 1%AEP flooding.Flood risk at the greenfield spaces currently used for grazing is mitigated.	<ul style="list-style-type: none">Works may be required within the River Barrow’s Special Areas of Conservation (SAC). Mitigation of temporary construction impacts will be needed.Invasive species require treatment and removal before commencement of works to avoid spreading.The town’s archaeological features may require monitoring during the flood defences’ construction.Space for construction of defences between the Barrow and Spa St. Bridge and the Barrow left bank upstream of the Barrow Bridge is limited with several overhead and underground utilities crossings. The complexity of the construction will be significant.Space for construction of defences along AMR4 is also limited with several utilities crossings.Flood gates are unavoidable at various locations to maintain existing access. These measures require a warning and deployment plan.The option requires land acquisition for storage area.

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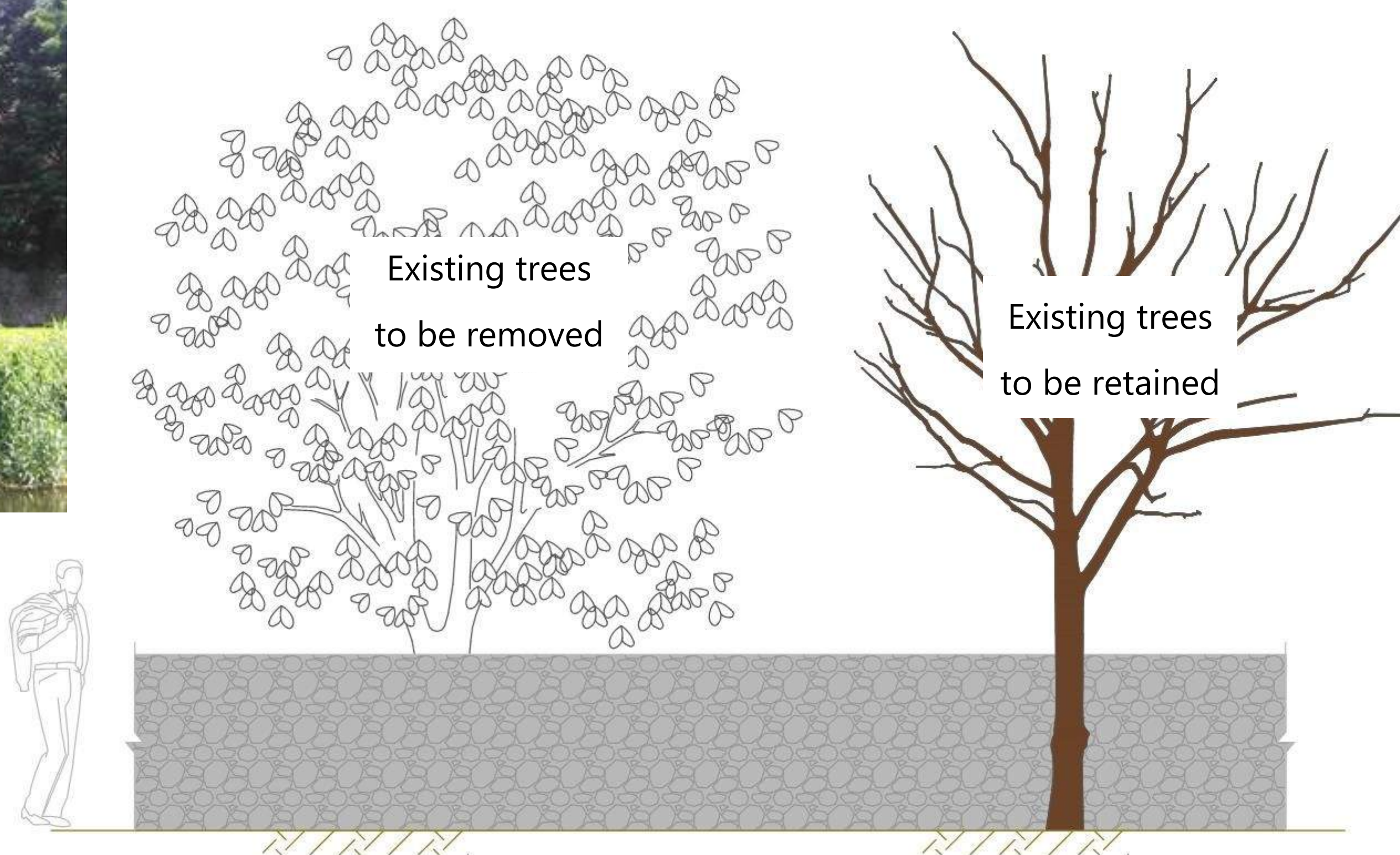
Option B considers a mix of flood defence embankments and walls for the river Barrow with reduced height compared to Option A, a water retention area for the Blackstick Drain with bypass channel, widening of part of the Barrow River and three culvert upsizes at tributaries AMR4, Blackstick Drain, and AMR6. For one of these culverts, a regrading of the tributary section upstream and downstream of the structure is necessary to ensure sufficient depth of cover and improve conveyance. Increase to the open flow section is proposed for the existing bridges within the Scheme area (Barrow Bridge and Spa St. Bridge). Flood gates are required at different locations along the Barrow floodplain and tributaries to maintain current access. Flood defence heights are based on the 1%AEP event with an additional allowance typically 300mm for walls and 500mm for embankments. The option would include the following defences divided per area.

Area	Defences	Average Heights	Total Lengths
Railway to AMR4 confluence	Embankment on the River Barrow Floodplain at the Left Bank	1.1m	280m
AMR4	Embankments and Walls on AMR4 Right Bank and River Barrow floodplain at the Right Bank	0.8m	400m
	Embankments and Walls on AMR4 Left Bank and around the Greenfield Area	1.8m	270m
	Culvert upsize to 1.20m Diameter and Regrade of part of AMR4.		100m (regarding)
AMR4 confluence to Barrow Bridge	Walls on River Barrow Left and Right Bank	1.6m	450m
Barrow Bridge to Spa Street Bridge	Walls on River Barrow Right Bank and Embankments and Walls along River Barrow Floodplain at the Left Bank Culvert upsize to 0.8m Height x 1.0m Width Barrow Bridge and Spa Street Bridge Opening widening	0.9m	900m
Blackstick Drain	Water Retention Area (Wetland) with Bypass Channel from the Blackstick Drain Right Bank		18000m ² (area)
	Embankments on Blackstick Drain Floodplain behind proposed Water Retention Area	1.2m	630m
	Wall on Blackstick Drain Left Bank and Embankments on Blackstick Drain Right Bank	1.3m	885m
	Culvert upsize to 1.2m Height x 1.5m Width		
Spa Street Bridge to AMR8	Walls and Embankments on River Barrow Right Bank and on Floodplain at the Right Bank	1.2m	530m
	River Barrow widening downstream of Spa Street Bridge		950m
	Culvert upsize to 0.8m Diameter		
AMR13	Embankments and Wall around Greenfield Area	1.2m	920m
	Water retention Area on the Greenfield Area		75500m ² (area)

Benefits	Constraints
<ul style="list-style-type: none">Option B would protect 144 properties from flooding for the 1% AEP event.The option does not increase the flood risk downstream .Hard defences are lower than Option A.There is potential for improvement of riparian habitats, creation of wetlands habitats, opportunities to encourage wildflowers/grasses and nesting birds at the following locations:<ul style="list-style-type: none">⇒ downstream of Spa Street Bridge⇒ Blackstick Drain wetland, and⇒ AMR13 water retention area.The following key transport routes are protected from flooding:<ul style="list-style-type: none">⇒ Barrow Bridge and Spa Street Bridge⇒ Patrick’s Street⇒ Lea Road⇒ Portlaoise Road and Foxcroft AvenuePortarlington’s monuments are protected from flooding.Portarlington’s Botley lane and Bracklone industrial estates are protected from flooding	<ul style="list-style-type: none">Works may be required within the River Barrow’s Special Areas of Conservation (SAC). Mitigation of temporary construction impacts will be needed.Invasive species require treatment and removal before commencement of works to avoid spreading.The town’s archaeological features may require monitoring during the flood defences’ construction.Space for construction of defences between the Barrow and Spa St. Bridge and the Barrow left bank upstream of the Barrow Bridge is limited with several overhead and underground utilities crossings. The complexity of the construction will be significant.Space for construction of defences along AMR4 is also limited with several utilities crossings.Flood gates are unavoidable at various locations to maintain existing access. These measures require a warning and deployment plan.The option requires land acquisition for storage area.Permanent works for channel widening at the downstream of Spa Street Bridge will require a significant amount of excavations and possible diversion of existing services.

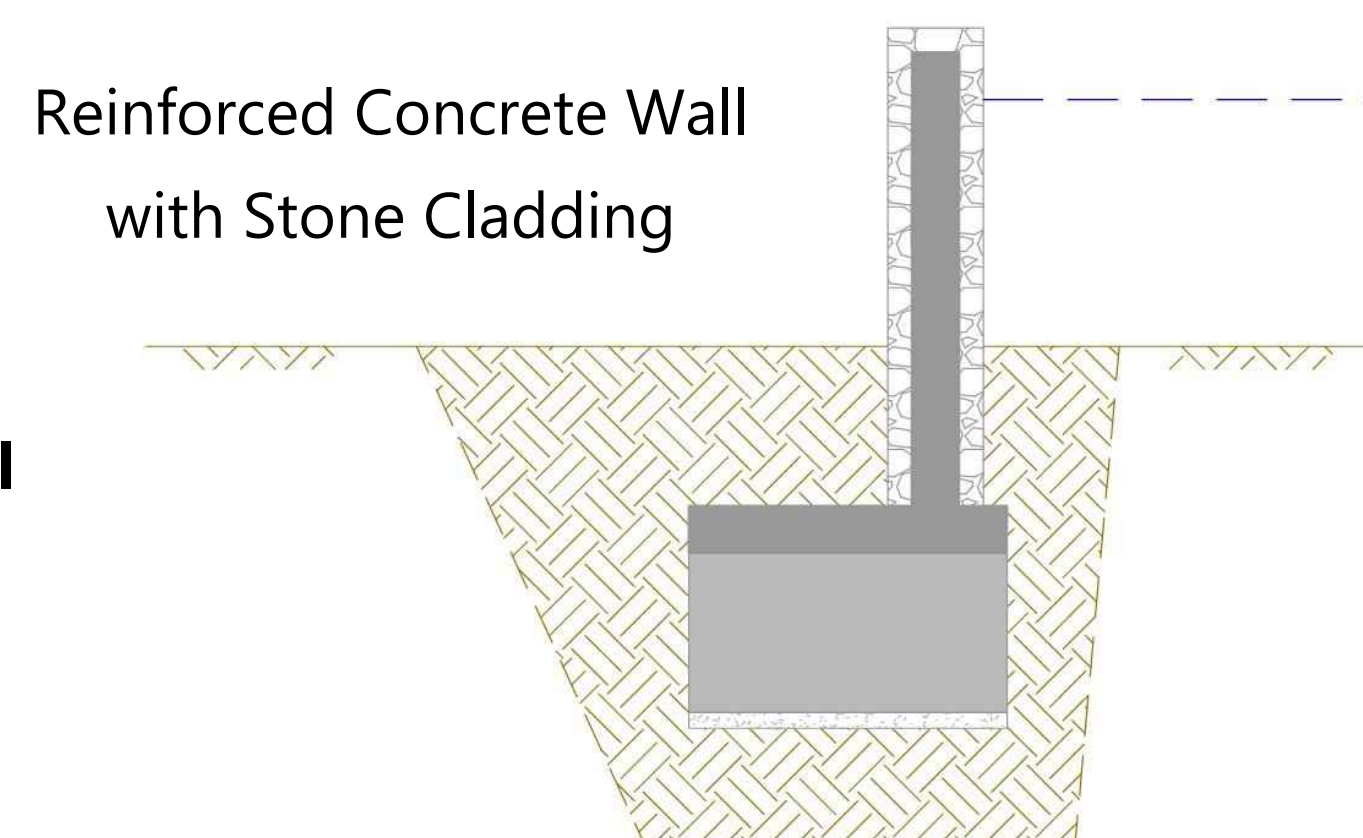


Proposed Wall Location
Downstream of Barrow Bridge

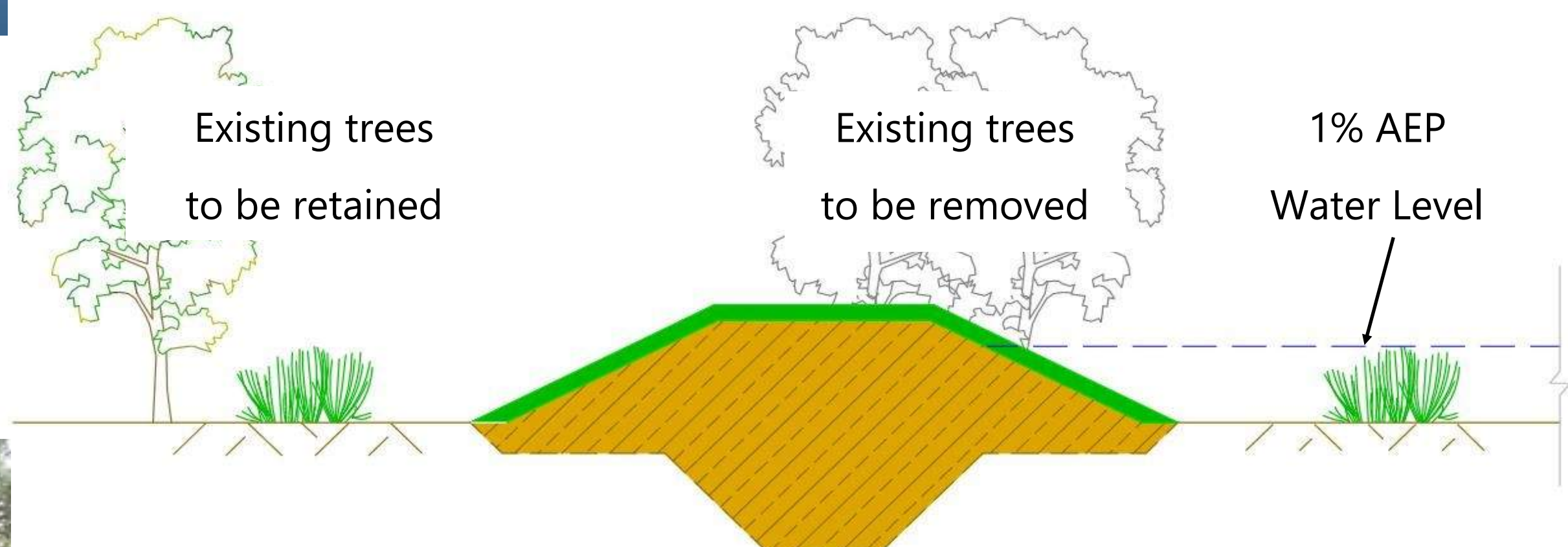


Proposed Location
Botley Lane

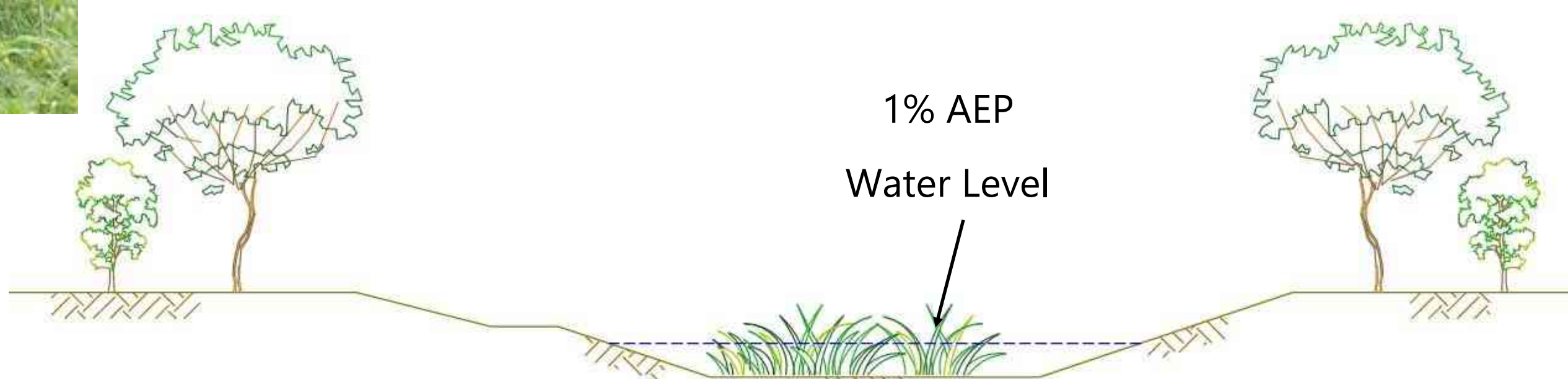
Type A
Proposed Flood Defence Wall



Proposed Location
Blackstick Drain



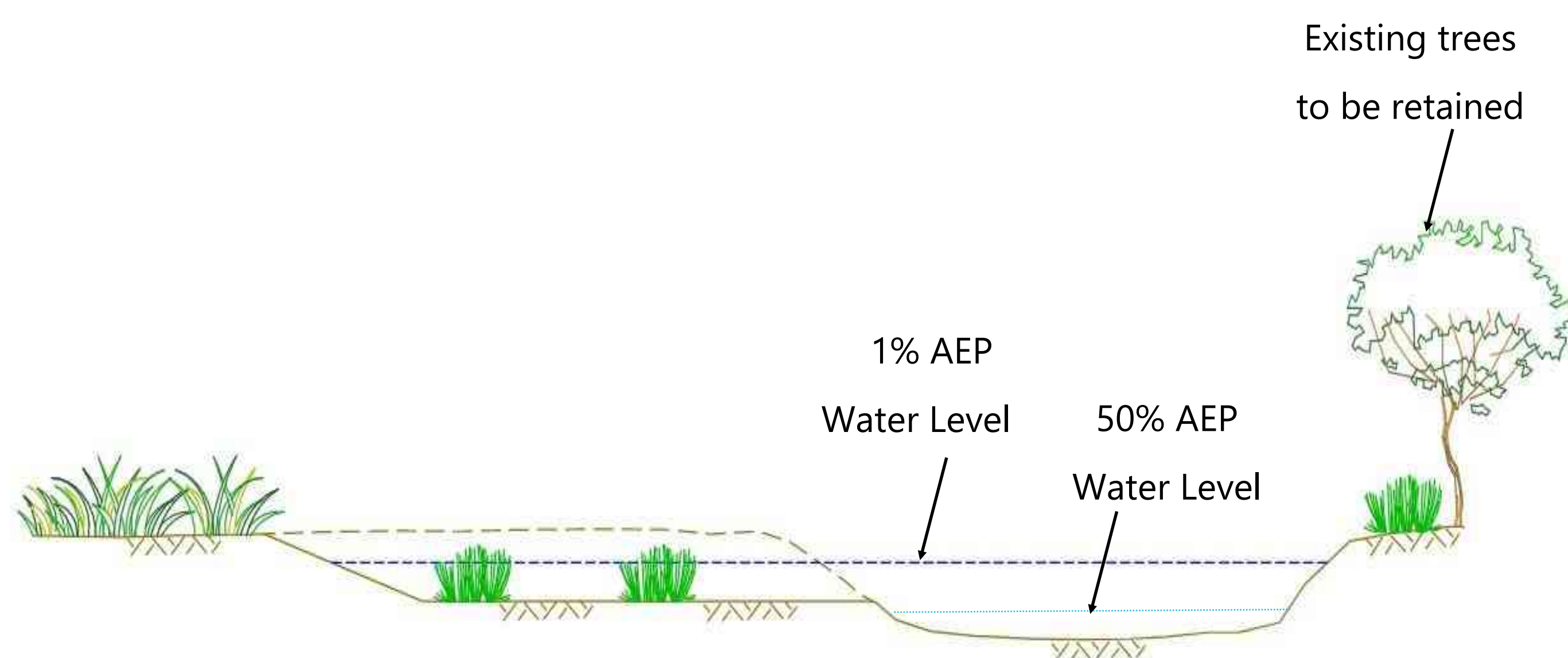
Type B
Proposed Flood Defence Embankment



Type C
Proposed Natural Water Retention



Proposed Channel Widening
River Barrow

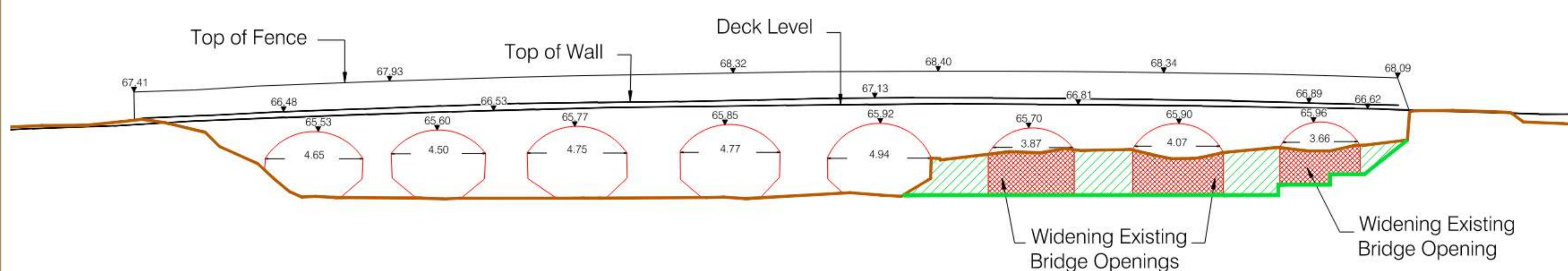


Type D Conveyance Improvement
Channel Widening



Proposed Bridge Widening
River Barrow

Type E Conveyance Improvement
Widening Existing Bridge Openings



Protecting the History and Environment of Portarlinton

The historic town of Portarlinton is a heritage asset and the proposed flood relief scheme will aim to protect the town's archaeological significance. A detailed study was undertaken to assess impacts of potential flood defences on the archaeological, architectural and cultural heritage resources.

In total there are 90 protected structures within the Scheme Boundary of which:

- 64 historical buildings or structures
- 13 recorded monuments
- 3 heritage assets. Two of these are ringforts and the other is the historic town of Portarlinton.

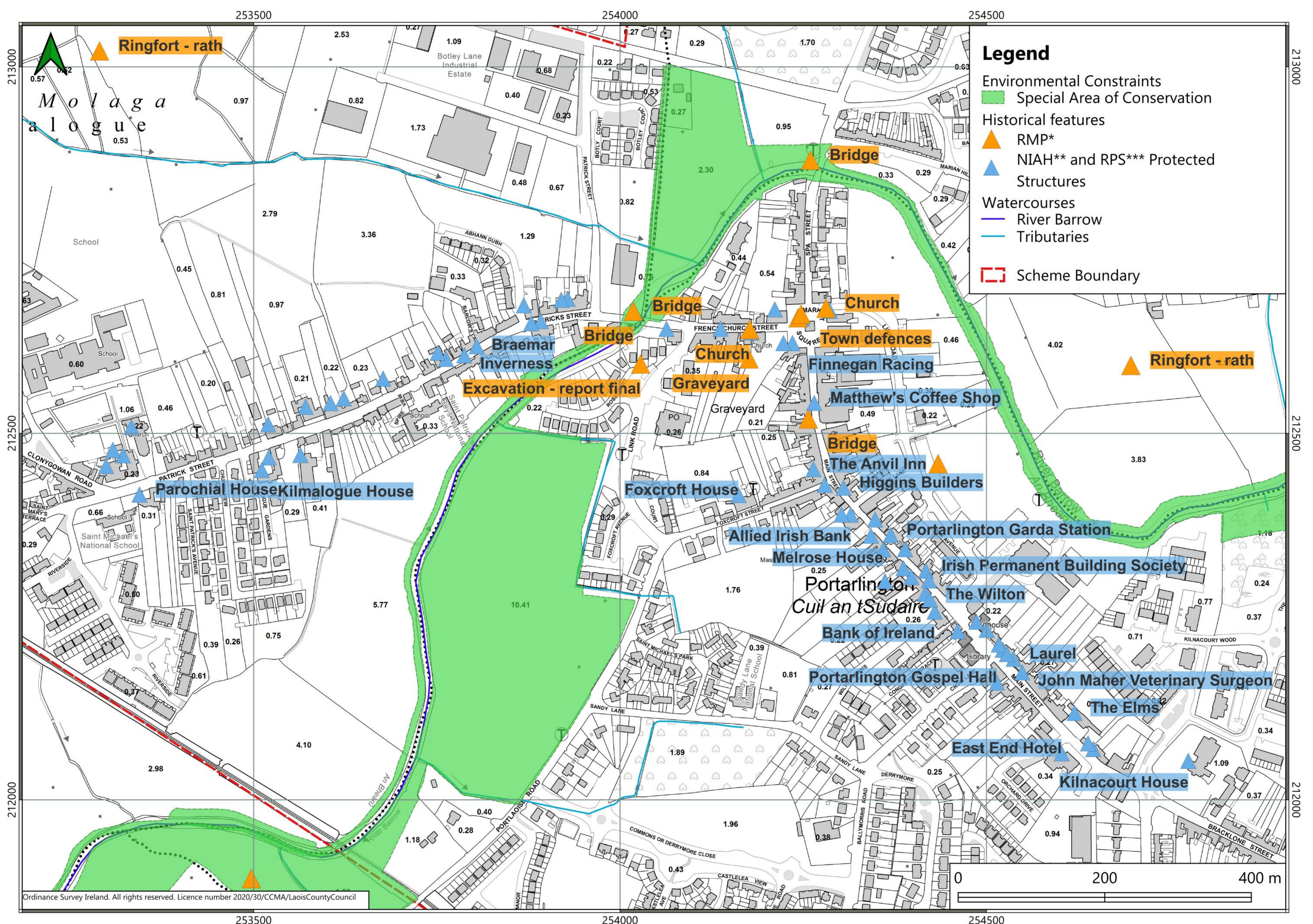
The Barrow Bridge and Spa St. Bridge are of particular historical significance therefore due consideration was given to any modification of these structure as part of the proposal.

The majority of the town historical city centre together lies within the archaeological notification area.



A view of Arlington House

Options A and B include works within the River Barrow Special Area of Conservation (SAC) therefore careful consideration is required during both design and construction to ensure that significant impacts to the qualifying features of the SAC are not negatively impacted.



Map of historical features and Environmental constraints within Portarlinton Scheme Boundary

*RMP — *Record of Monuments and Places*

***NIAH — National Inventory of Architectural Heritage*

***RPS — *Record of Protected Structures*

Field and properties near the Derrycastle Trail



Wet meadows including wild flower and grass species could provide habitats for a range of animals, plants, insects and birds.

River bank behind Patrick Street and Rose Court



Opportunities for aquatic planting along new river flood defence walls and enhance habitats.

Open space adjacent to the R419 road



Further planting within the space to provide a woodland corridor to support existing wildlife initiatives in the location (such as the bug hotel).

View from the R419 road

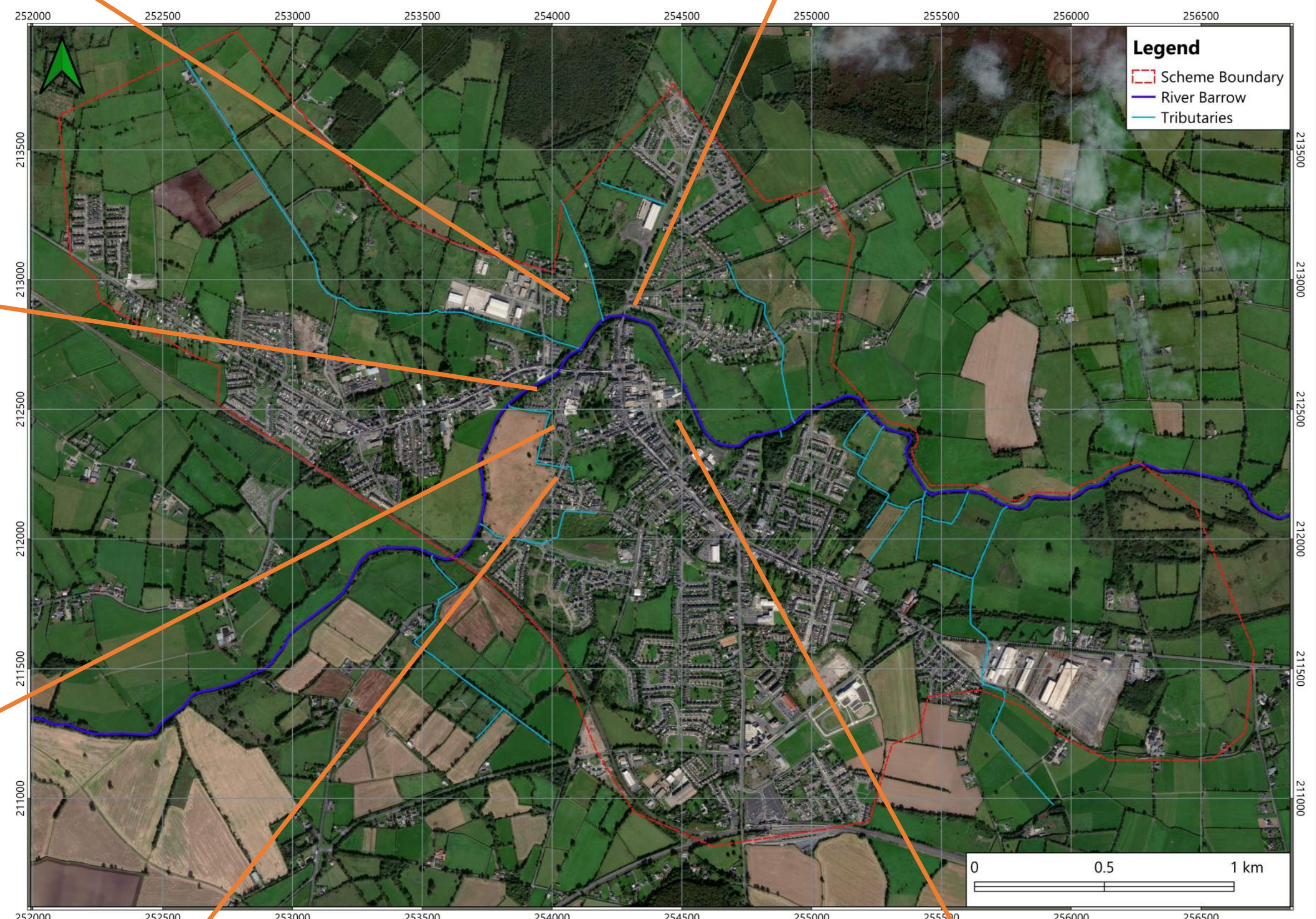


Consideration of the materials used for the flood walls will help to soften any visual impacts and blend the new walls into their locations.

Open space adjacent to Marian Hill



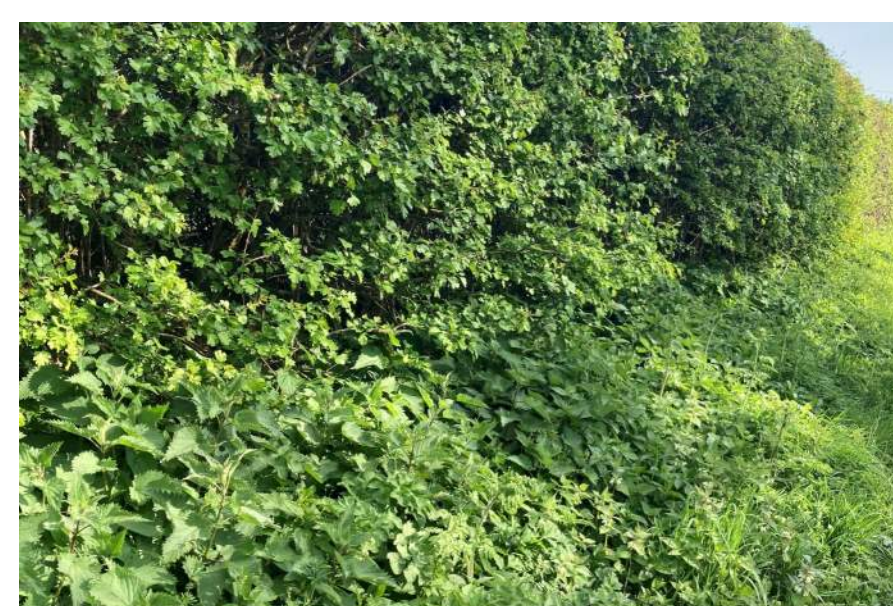
Native planting along the new flood walls would create wildlife corridors and also assist in screening views from nearby areas of public open space or recreational opportunities such as the Derrycastle Trail cycle and footpath route.



View of floodwall within People's Park



Native shrub and ground cover planting along the new flood wall would assist in blending it into the park, whilst also providing ecological benefits.





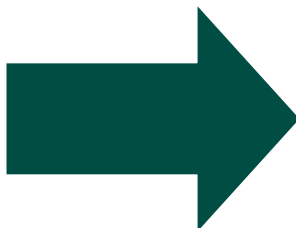
Scan this QR code to access the Portarlington Flood Relief Scheme Website

Summary of the Work done to date for the Options Development

STEP 1

Development of long list of options to consider all potentially suitable Flood Relief Measures and their combination.

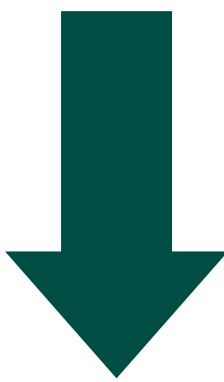
Flood Relief Measures Considered	Channel and Bank Maintenance
	Hard Defences (Walls, Embankments)
	Offline/Online Water Retention Area
	Individual Defences for Properties
	Building Relocation
	Flood Forecasting and Warning System
	Culvert Upsizes
	Non-return Valves and Pumping
	Channel Dredging
	Channel Regrading
	Bypass Channel
	Channel Widening



STEP 2

Some of these measures were discounted following the outcome of the hydraulic modelling and other environmental and technical considerations.

Flood Relief Measures Further Considered and Modelled	Hard Defences (Walls, Embankments)
	Offline/Online Water Retention Area
	Culvert Upsizes
	Non-return Valves and Pumping
	Channel Widening
	Channel Regrading
	Channel Dredging
	Bypass Channel



STEP 3

The most technically efficient measures with the less environmental impact were then combined to form 2no. Flood Relief options.

Option A	Hard Defences (Walls, Embankments)
	Offline Water Retention Area
	Culvert Upsizes
	Channel Regrading
	Bypass Channel

Option B	Hard Defences (Walls, Embankments)
	Offline/Online Water Retention Area
	Culvert Upsizes
	Channel Widening
	Channel Regrading
	Bypass Channel