DESIGN & BENEFITS GUIDE

Environment Agency

Delivering improved flood protection, environmental enhancements and improved community amenities for Preston and South Ribble.

# Preston & South Ribble Flood Risk Management Scheme

Version 2 | May 2025

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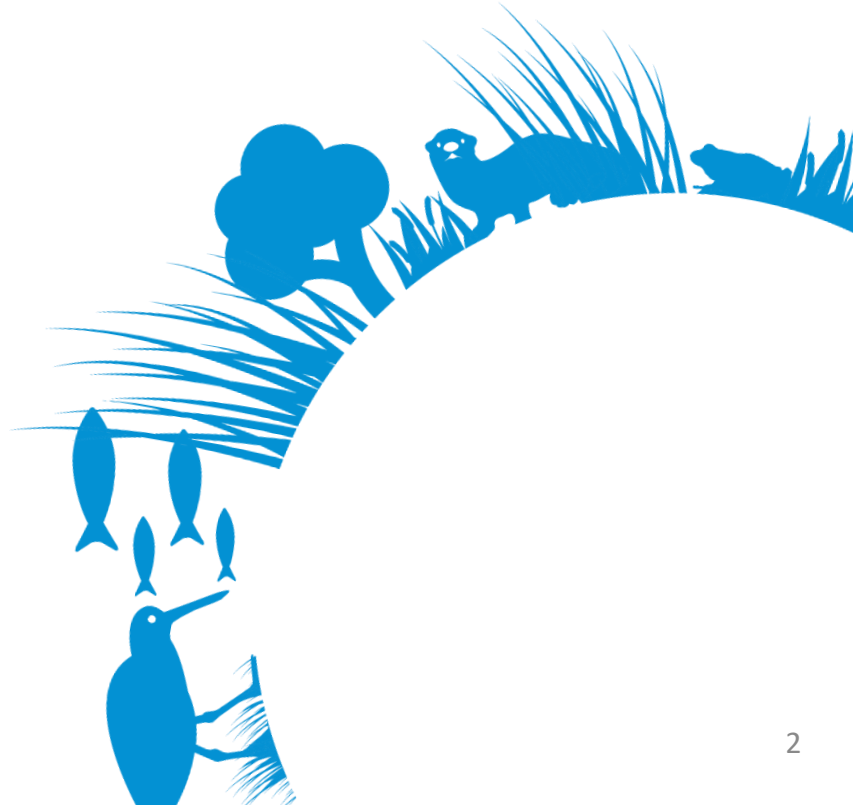


# BACKGROUND
## Introduction


This document offers an overview of the Preston & South Ribble Flood Risk Management Scheme, including details on how it will be delivered and what the community can expect.

The Environment Agency began construction of the Scheme in 2022 and once completed, it will provide better flood protection for around 5000 homes and businesses.

Beyond reducing flood risk, the Scheme will also create a lasting, positive legacy for the wider community and the environment.

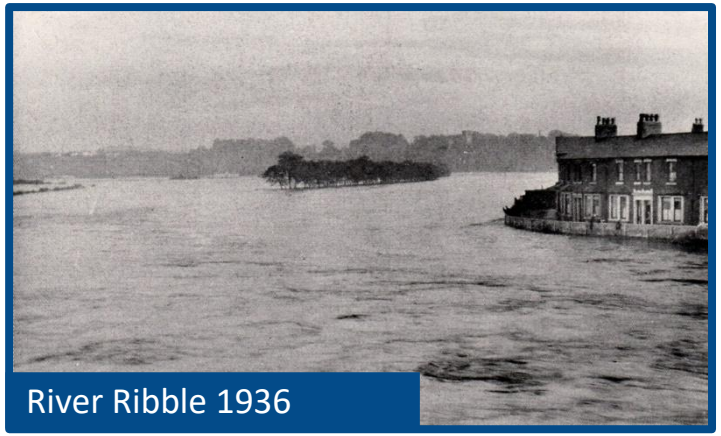
Construction started at Broadgate in Preston and in Lower Penwortham, and will follow the River Ribble upstream into Walton-le-Dale and out towards the Blue Bridge near the River Darwen.



# BACKGROUND
## Historical Flooding in Preston & South Ribble

Many communities across Lancashire have experienced the devastation flooding can have on lives and livelihoods. With climate change giving us wetter winters, and the risk of flooding set to increase, we need to act now. This is why we are taking steps and planning for the future — helping to ensure communities living close to the River Ribble and River  Darwen are better protected and more resilient to climate change.

The existing defences were built in stages over the last century and are now reaching the end of their design life. The Flood Risk Management Scheme will repair, replace, and extend these defences.


River Ribble 1936


Walton-le-Dale 2015


Broadgate c1900s

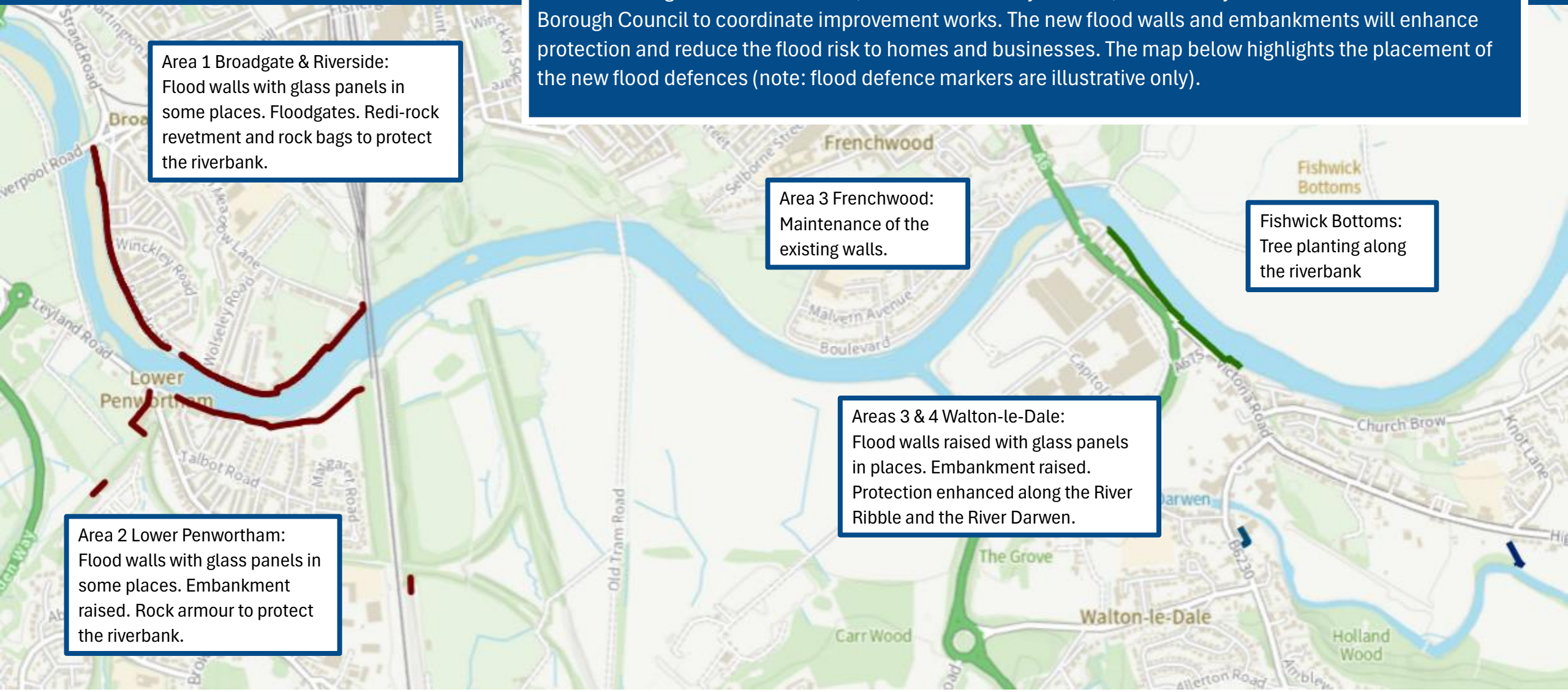

Leyland Road 1990


River Ribble 2015

# BACKGROUND
# Our Approach

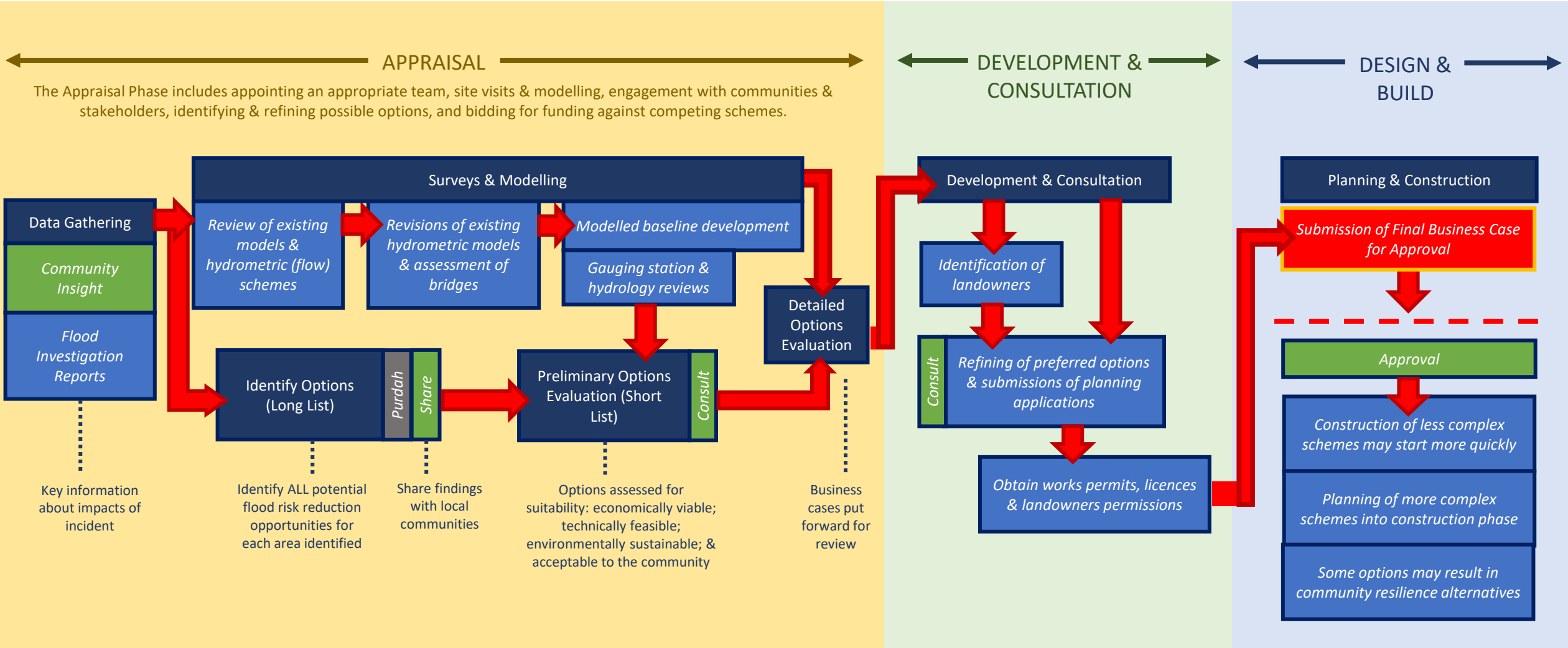
## The Flood Risk Management Scheme:

We are working with United Utilities, Lancashire County Council, Preston City Council and South Ribble Borough Council to coordinate improvement works. The new flood walls and embankments will enhance protection and reduce the flood risk to homes and businesses. The map below highlights the placement of the new flood defences (note: flood defence markers are illustrative only).



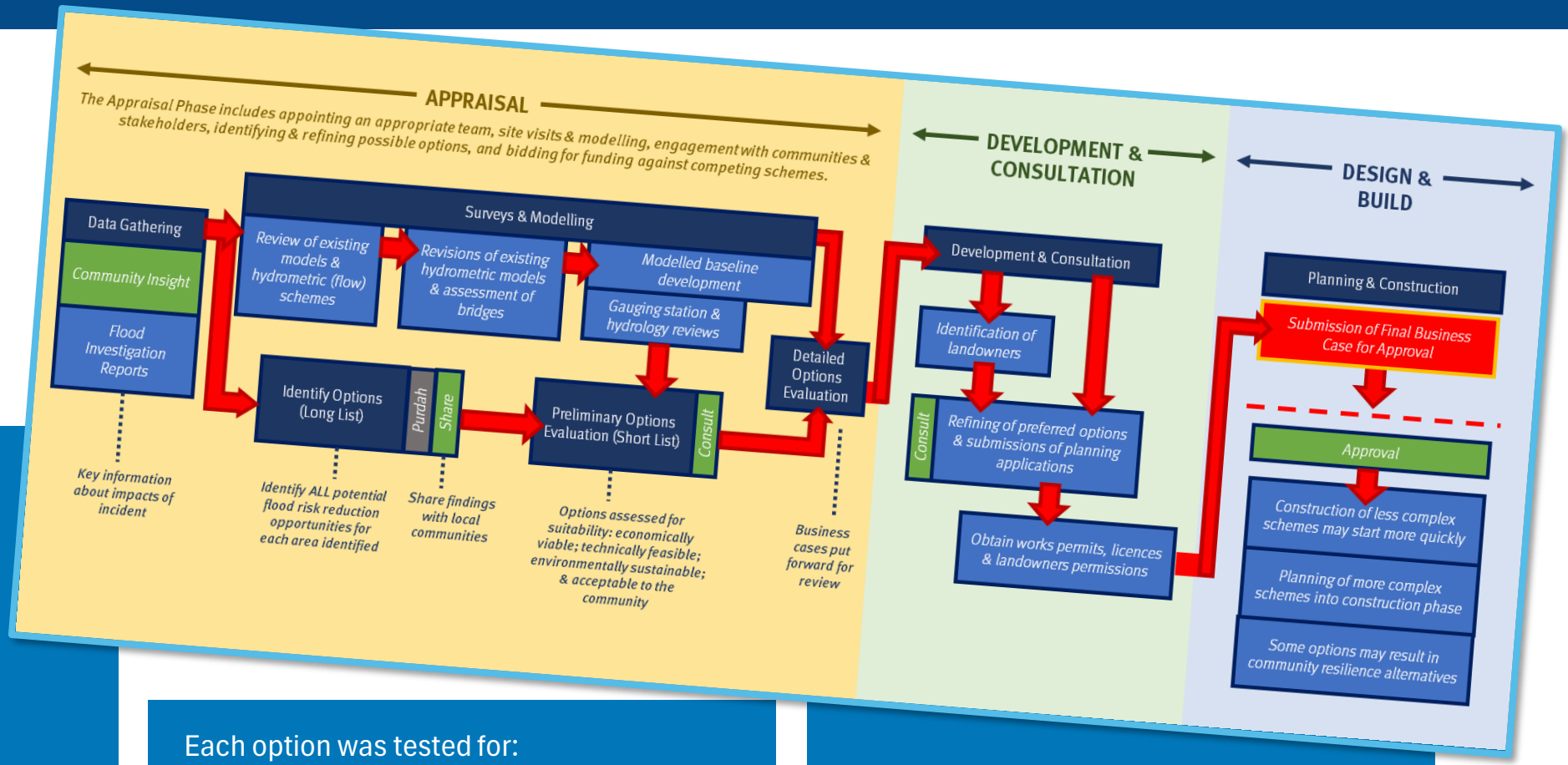
# BACKGROUND
# The Flood Risk Management Journey

All flood schemes go through a process of public consultation, engineering analysis, environmental assessment, and economic appraisal before agreement is made on a preferred set of options. The preferred options must then be approved by planning committees before any work can commence.



# BACKGROUND
## The Preston & South Ribble Flood Risk Management Journey

Over 20 design options were tested leaving a short list to take forward for the Preston & South Ribble Flood Risk Management Scheme.




Options scored for their feasibility included:

- Flood storage
- Linear defences
- Demountable temporary defences
- River conveyance improvements
- Natural Flood Management
- Urban redevelopment / re-naturalisation of the river
- Property flood resilience

Each option was tested for:

- ✓ Technical suitability
- ✓ Environmental impact
- ✓ Economic viability
- ✓ Social acceptability

The final options include:

- Linear flood walls
- Embankments
- Flood gates

# BACKGROUND
## Key Facts

When complete, the Flood Risk Management Scheme will deliver a series of flood risk, community, environment, and economic benefits to Preston and South Ribble. This includes enhancing local areas through landscaping, tree planting, and creating a new wetland habitat for wildlife.

We are also delivering a series of educational programmes, helping children to understand the impact of flooding and climate change.


Engagement events & activities held in the communities impacted or benefitting from the scheme

| Providing flood protection & better community amenities | Providing better economic growth & education opportunities | Protecting & enhancing the local environment |
|---|---|---|
| 5km — Defences constructed, improved or maintained | Over £54.7m — Investment in Preston & South Ribble | 12:1 — Trees to be planted for every tree removed |
| 5000 — Homes & businesses better protected from flooding | 100+ — People have worked on the scheme so far | 3 — SuDS programmes for local schools |
| 3 — New sports pitches created for the community | c25 — Educational sessions to be delivered in local schools | 0.35 — Hectares of new wetland created |

# Education

# WORKING WITH SCHOOLS
## Surface Water Issues & Equipment

The Flood Risk Management Scheme has delivered three drainage systems to help local schools reduce their surface water flood risk. It has also provided equipment to enhance educational opportunities.

- ✓ Rainwater storage to teach sustainability
- ✓ Planters to learn about growing plants
- ✓ Interactive play areas for fun learning
- ✓ Sheltered spaces for outdoor activities
- ✓ Extra amenities, including seating, fencing & educational equipment

The Environment Agency has worked with:

- Frenchwood Community Primary, Preston
- St. Mary Magdalen's Catholic Primary, Lower Penwortham
- St. Leonard's C.E. Primary, Walton-le-Dale

St. Leonard's C.E. Primary School

# EDUCATION & INNOVATION
## Minecraft ‘Rivercraft’


Broadgate recreated in Minecraft

Rivercraft is a unique and immersive virtual learning experience, which sees the city of Preston transformed into a virtual world within Minecraft. Minecraft is hugely popular — most people have heard of it, even if they haven’t played it! After purchasing the rights to the game in 2014, Microsoft introduced an ‘education edition’ for schools and education establishments to use for teaching purposes.

In September 2021, the Environment Agency began working with Microsoft and Blockbuilders to design Rivercraft. Three games were created within a virtual Preston and based on the real-life Flood Risk Management Scheme:

1. Managing Flood Risk
2. Climate Change & Flooding
3. Environment & Wellbeing

In game one, players get to defend the city of Preston from flooding through the construction of flood defences (including walls and glass panels) and developing natural flood risk management techniques.


Preston students

Just like in other versions of Minecraft, players can teleport from place to place around the city while spotting some of Preston’s most famous landmarks.

The other two Rivercraft games allow users to carry out an Environmental Assessment and reduce their own impact on climate change.

Rivercraft is hosted by Microsoft on their global Climate and Sustainability Minecraft Education site. It is available globally in over 25 languages for both educational and home users.

# Delivering the Scheme

# **PHASE 1:**
# Areas 1&2

# DELIVERING THE FLOOD SCHEME

The Environment Agency is committed to ensuring the design of the Flood Risk Management Scheme is sympathetic to local areas.

The new flood walls will be built and finished in a way that is appropriate for the existing buildings and landscape.  Designs consider the proximity to heritage conservation zones and historical monuments.

The designs are also agreed with Lancashire County Council, Preston City Council, and South Ribble Borough Council through the planning application process and public consultation.

New concrete carving next to the original stonework


Concrete carving underway to blend a section of new wall into the Gas Pipe Bridge

# DELIVERING THE FLOOD SCHEME
## Flood Wall Panels

Around 5km of flood walls will be built, replaced or maintained as part of the Flood Risk Management Scheme.

In Phase 1, the walls are made predominantly from pre-cast concrete and, in places, topped with glass panels.

Additionally, some local footpaths have been enhanced to provide better public access.

Artist's impression of new flood defences at the rear of BAC/EE Association along Riverside, Preston

# DELIVERING THE SCHEME
## Glass Panels

Glass panels have been used in Areas 1 and 2, where wall heights exceeded 1.4m – using glass allows residents and visitors to continue to enjoy river views.

The glass panels are part of the defences and strong enough to withstand the forces of flood water. The outer frames have been powder-coated black to match street furniture, heritage assets, and the floodgates.

The glass is also 'self-cleaning' to provide the best finish and to reduce the need for cleaning.

The new flood wall and glass panels along Riverside Road, Lower Penwortham

# DELIVERING THE SCHEME
## Floodgates

Two new floodgates will be installed as part of the Scheme along Riverside in Preston and two more at the entrance to Miller Park.

The floodgates are recessed between pillars, so they are out of  the way when not required.  The gates will remain open most of the time and will only be closed by the Environment Agency in the event of severe weather warnings and the risk of flooding.

New floodgate under construction near Miller Garden Apartments

# DELIVERING THE SCHEME
## Bank Stability

Redi-rock embankments are made from pressed concrete with an attractive cobblestone finish, the design includes a recess within each block for planting, which will ‘green up’ over time with vegetation and soften the look of the blocks. A Redi-rock embankment has been constructed off the riverbank near Broadgate.

Close-up of an example embankment

# DELIVERING THE SCHEME
## Bank Stability

Rock armour along Riverside Road, Lower Penwortham

To help reduce further riverbank erosion, we have installed rock armour and rock bags along some sections of riverbank.

Rock bags are flexible and adapt to the shape of the riverbank. Eventually, they will become covered with silt and help support vegetation and aquatic life in the river.

The rock armour is formed from large rocks strategically placed along the riverbank. The stone can withstand harsh weather conditions and the forces of water, reducing erosion.

Rock armour blends naturally into the landscape, and the gaps between the rocks will silt up overtime supporting plants and wildlife.

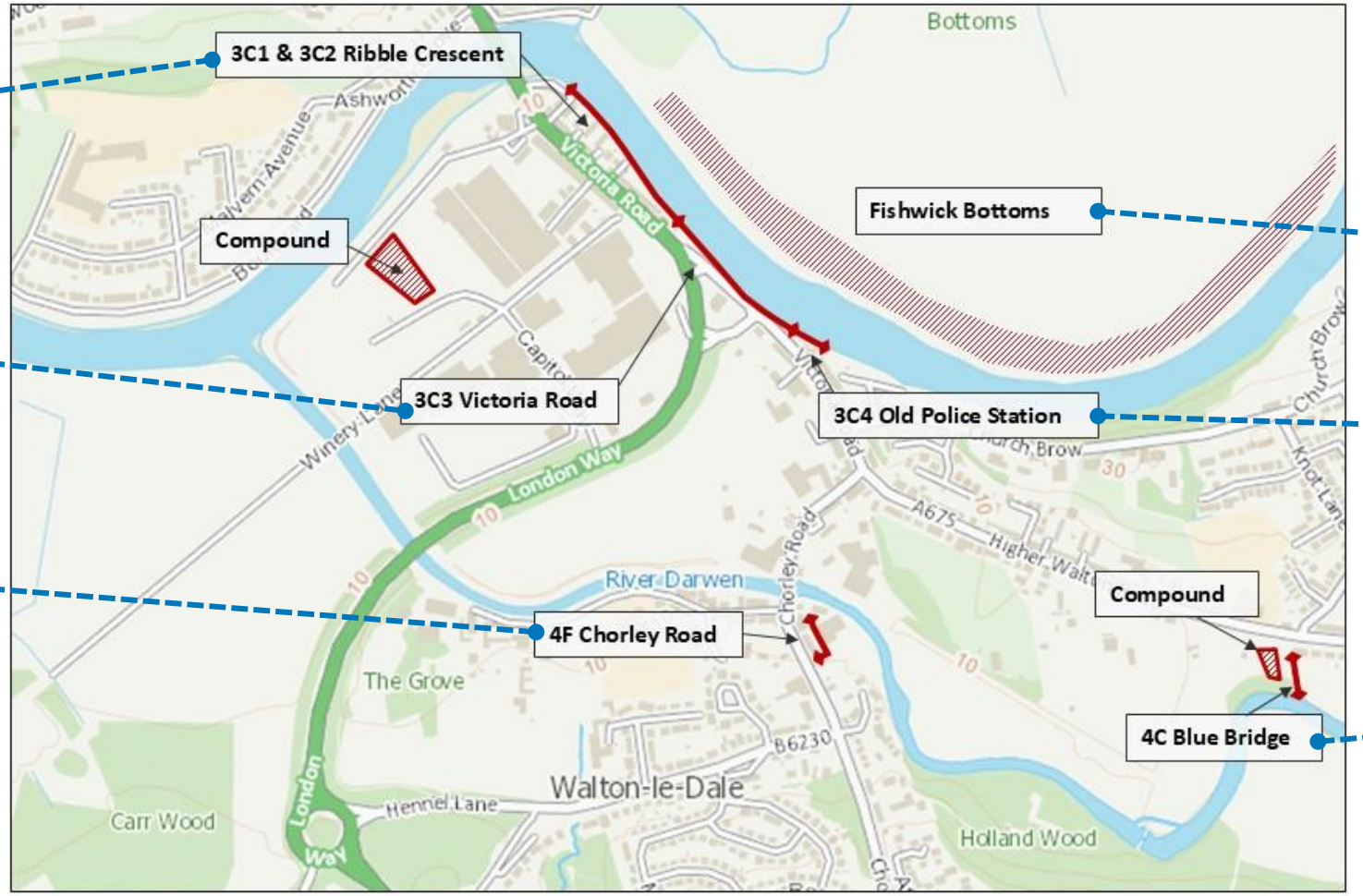
# **PHASE 2:**
Areas 3&4

# AREAS 3 & 4 MAP:
# Construction Areas

Glass panels to raise the height of the existing defences

Replacement higher flood wall

Flood wall




8,450 trees planted along the river, plus new hedgerows

Improvements to the existing defences

Raised embankment

# DELIVERING THE FLOOD SCHEME
## Wall Finishes

Visualisation of Victoria Road, where walls need to be raised by up to 0.3m

The new flood walls will be built and finished in a way that is in keeping with the existing area.

Along Victoria Road the replacement concrete flood wall will be faced with stone and topped with metal railings.

# DELIVERING THE SCHEME
## Wall Finishes


Visualisation of Chorley Road properties showing a maximum 0.7m flood wall

At the rear of properties on Chorley Road, the old garden wall will be replaced with a concrete flood wall, covered with brick slips (a type of cladding).

The new wall will also be topped with a wooden fence to provide residents with an attractive finish and privacy.

# DELIVERING THE SCHEME
## Glass Panels

Visualisation showing glass panels along Ribble Crescent, where walls need to be raised by up to 0.5m

In some areas, the existing flood walls are strong enough but need to be higher.

The coping stones will be removed and glass panels added.

The glass panels are an integral part of the defences and can withstand the pressures caused by high water levels.

The use of glass panels will mean residents can continue to enjoy river views.

# DELIVERING THE SCHEME
## Embankments


Visualisation of the raised embankment

Along the track near the site of the Blue Bridge, an embankment up to 1m high will be created.

The embankment will help reduce the flood risk to Higher Walton Road, in Walton-le-Dale.

# Community Benefits

# COMMUNITY BENEFITS
## Sports Facilities: Archbishop Temple CofE High School

The BAC/EE sports pitches have been temporarily incorporated into our site compound and to provide access roads for local properties. As an alternative venue, three grass football pitches have been created by the Environment Agency at Archbishop Temple C.E. High School:

- Senior Pitch – 100x64m plus 3m runoffs
- Youth Pitch (U16/U15 – 11v11) – 91x55m plus 3m runoffs
- Youth Pitch (U11/U12 – 9v9) – 73x46m plus 3m runoffs

Goal posts, for the new pitches, have been purchased by the Environment Agency with a partial grant from the Football Association.

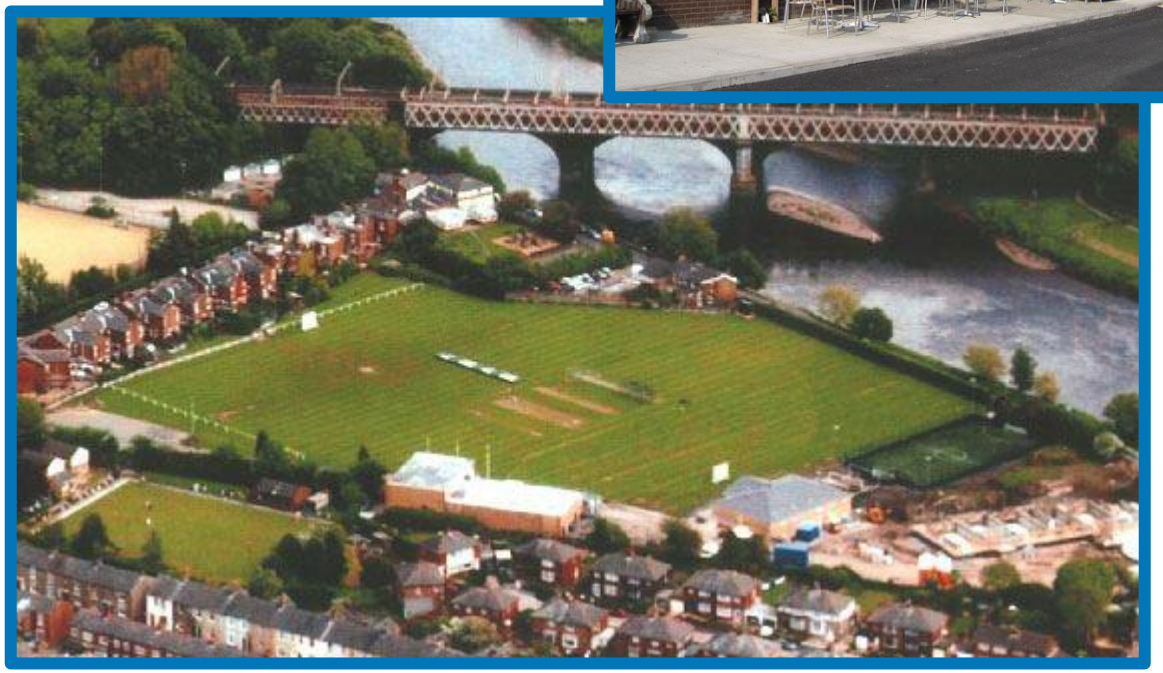
Following completion of the Flood Risk Management Scheme these pitches will remain in place for the school and the community to use — providing a legacy of sports provision in Preston.


July 2022

# COMMUNITY BENEFITS
## Sports Facilities: BAC/EE Social & Sports Association

The grounds of the BAC/EE S&S Association, in Preston, are currently being used as one of the Scheme's site compounds and to provide space for access roads. Once construction is complete, remediation and improvements will be made to the site:

- The pitches affected by the works will be reinstated to a high standard.
- The existing wooden score board will be replaced and upgraded with an electronic score board.
- The entrance and the car park will be resurfaced.
- Lines for car parking spaces will be redrawn.
- An asbestos floor has already been removed from the club house and new flooring laid.



# COMMUNITY BENEFITS
## Access for All

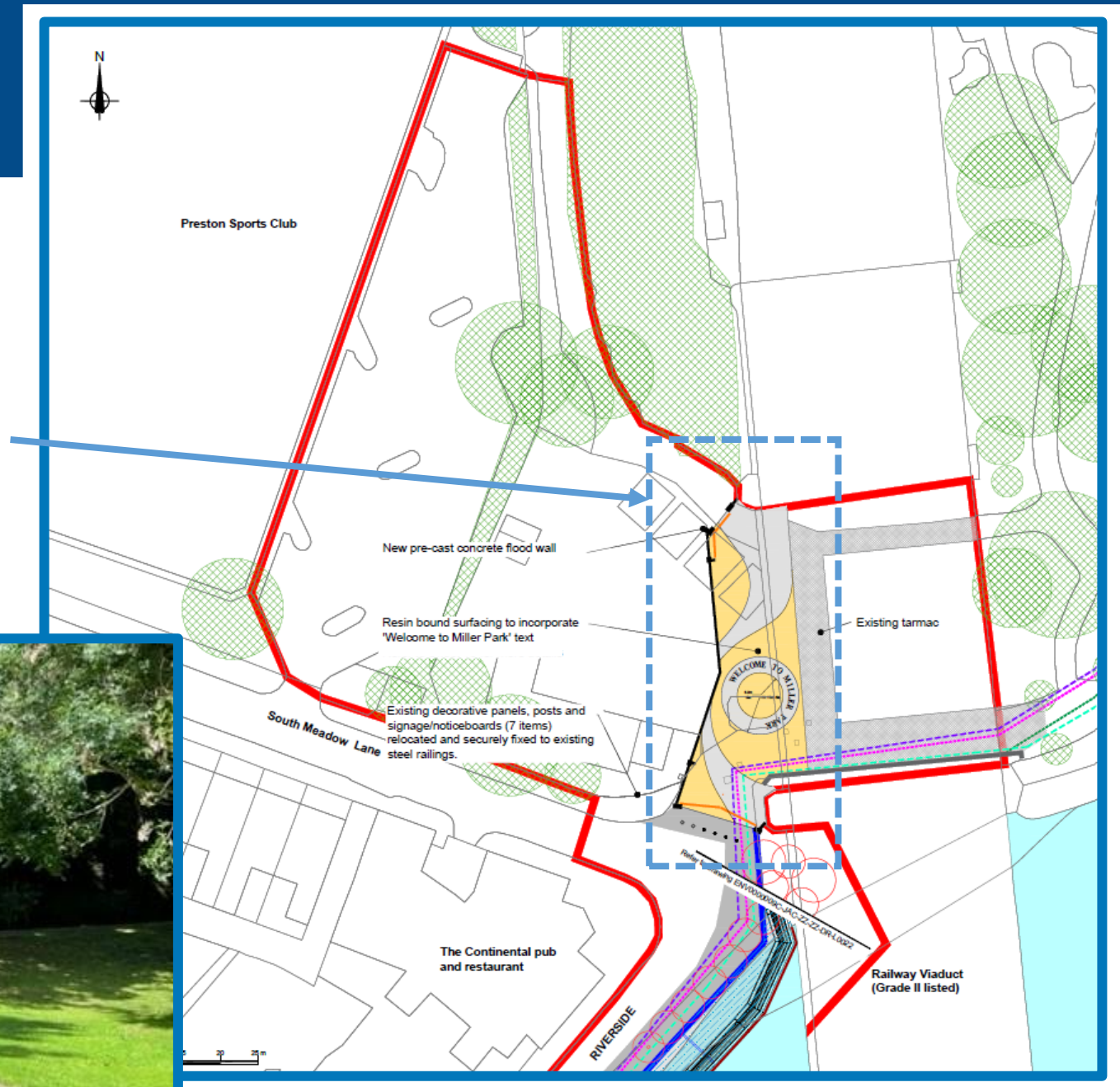
It is important that the Preston & South Ribble Flood Risk Management Scheme is inclusive. The design team has worked carefully to ensure everyone's needs are considered. Examples of inclusive design include:

- Providing more opportunities for pedestrians to access public open green spaces with formalised footpaths.
- Providing new tree, grass, wetland, wildflower, perennial, and shrub planting to promote mental health and wellbeing.
- Providing seating, including benches with backrests and armrests in key locations.
- Creating interesting features to promote the use of new footpaths.
- Avoiding stepped access where possible and creating ramped access.
- Avoiding awkward level changes, which may cause trip hazards, and ensuring visual contrast is designed into any necessary level changes.
- Ensuring pedestrian diversions are well communicated, sign-posted, and safe to use throughout the construction phase.

# COMMUNITY BENEFITS
## Avenham & Miller Parks Entrance

The entrance to Miller Park will undergo improvements as part of the flood risk management scheme.

The entrance space will be expanded towards the council depot to create a more open, welcoming space. The new area will be surfaced in resin bound material using high quality natural aggregate. The surface will be inset with ‘Welcome to Miller Park’ in black lettering.

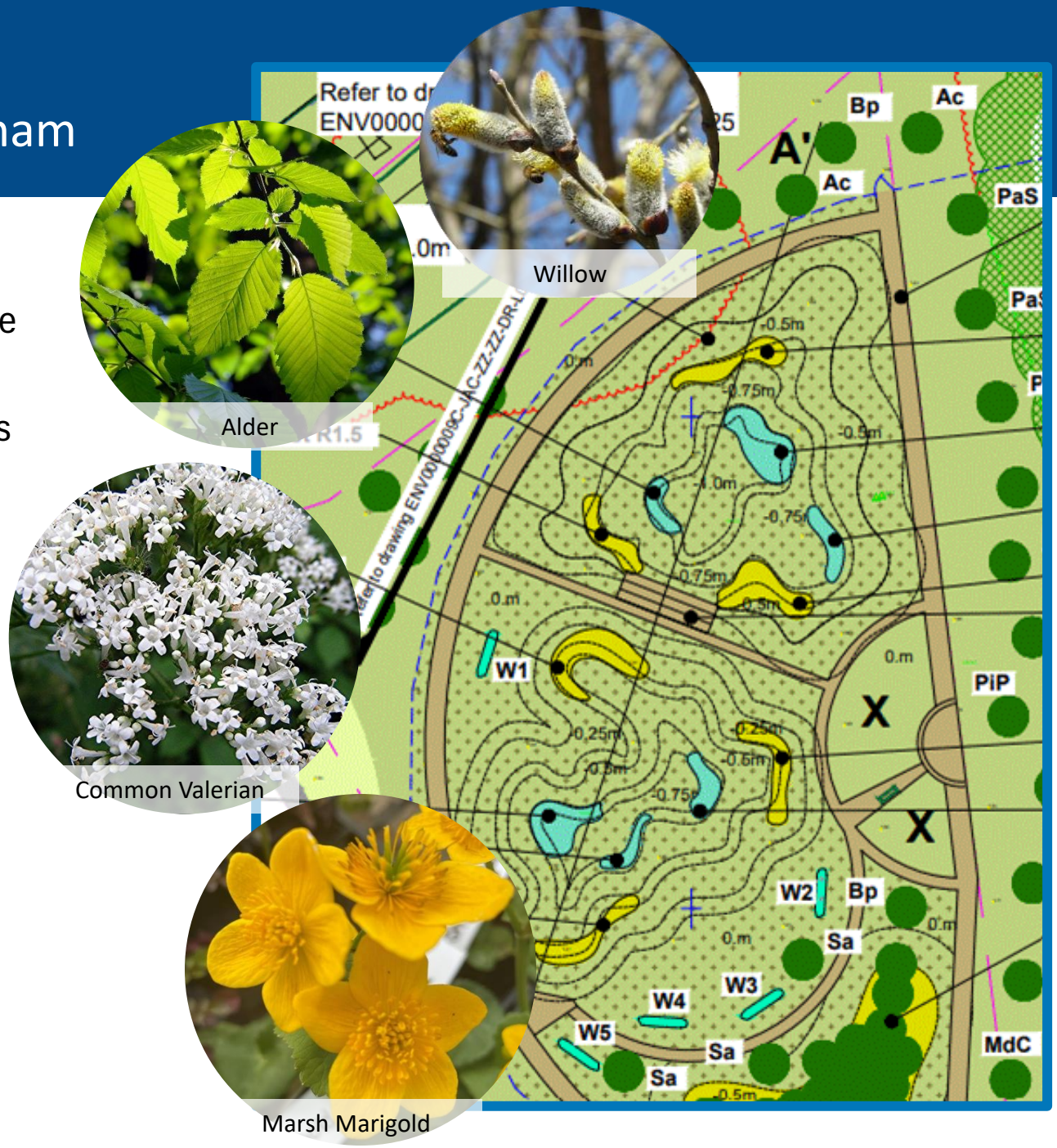


# COMMUNITY BENEFITS
## Ribble Sidings Wetland, Lower Penwortham

A new community wetland has been created at Ribble Sidings; it covers 0.35 hectares and includes:

- Woodland area with 170 native trees planted, plus a small orchard with five varieties of fruit trees.
- Species-rich grassland.
- Native wildflowers.
- Insect-friendly habitat
- Pond dipping platform.
- A network of paths around the site.

The adjacent play area has been refurbished by South Ribble Borough Council.



# COMMUNITY BENEFITS
## Ribble Sidings Wetland

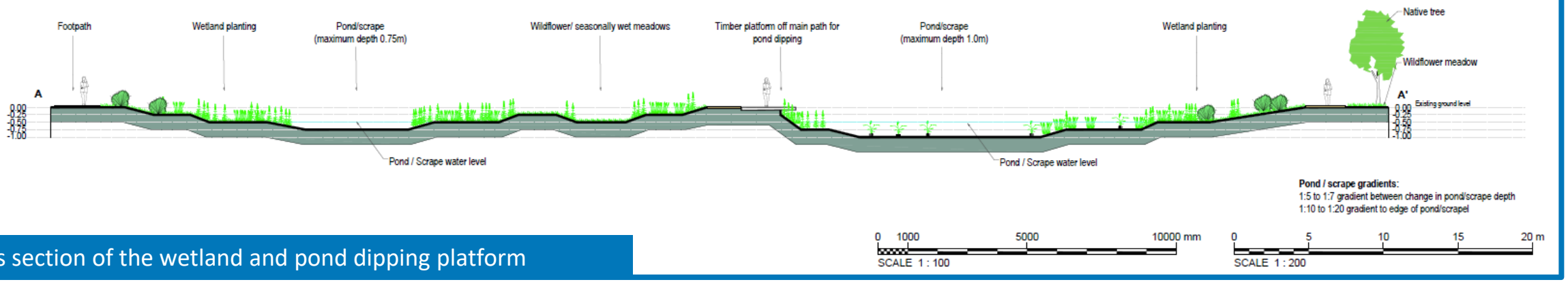

Damselfly


Toad


Newt

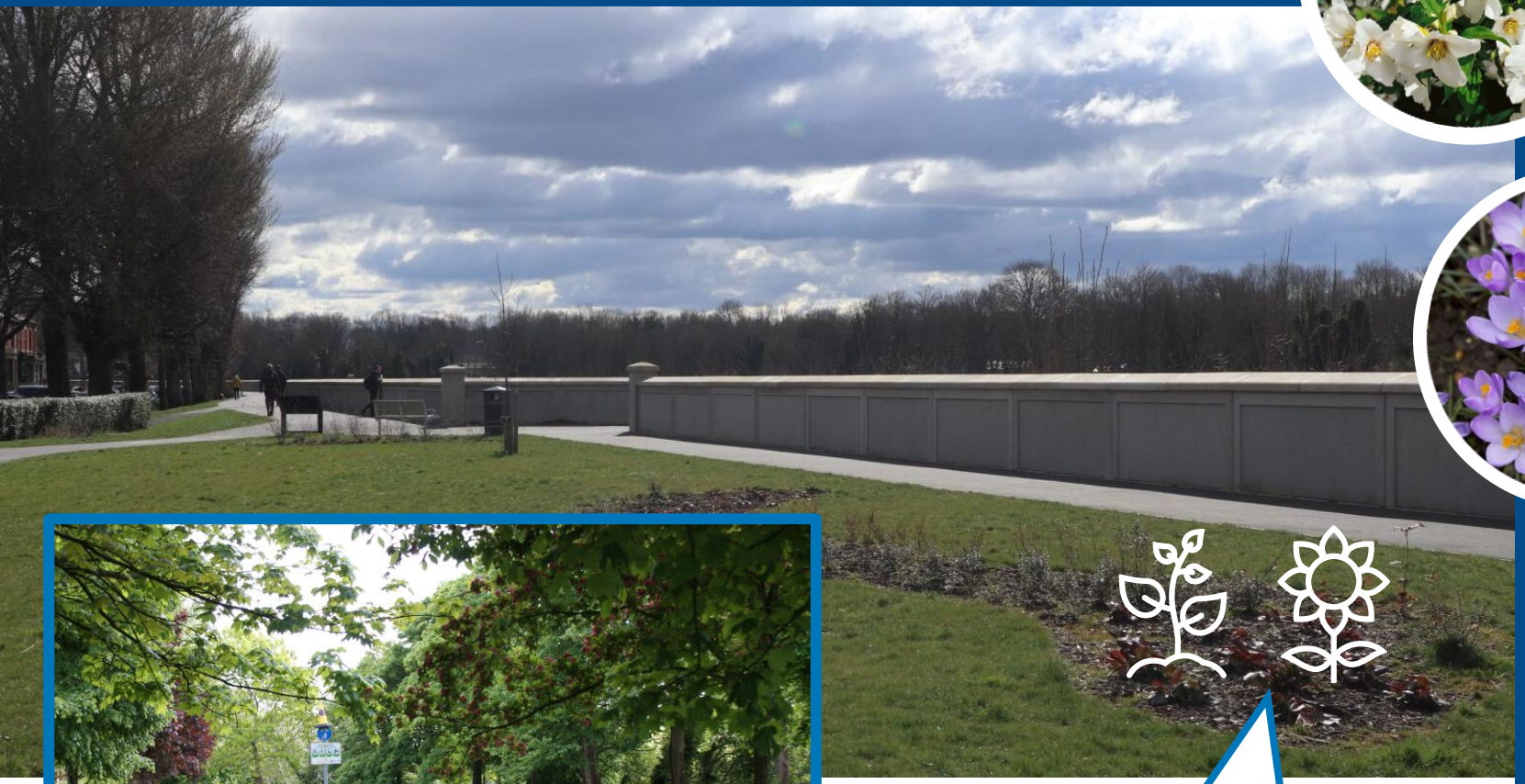

Frog


Dragonfly




Cross section of the wetland and pond dipping platform

# COMMUNITY BENEFITS
## Broadgate Gardens



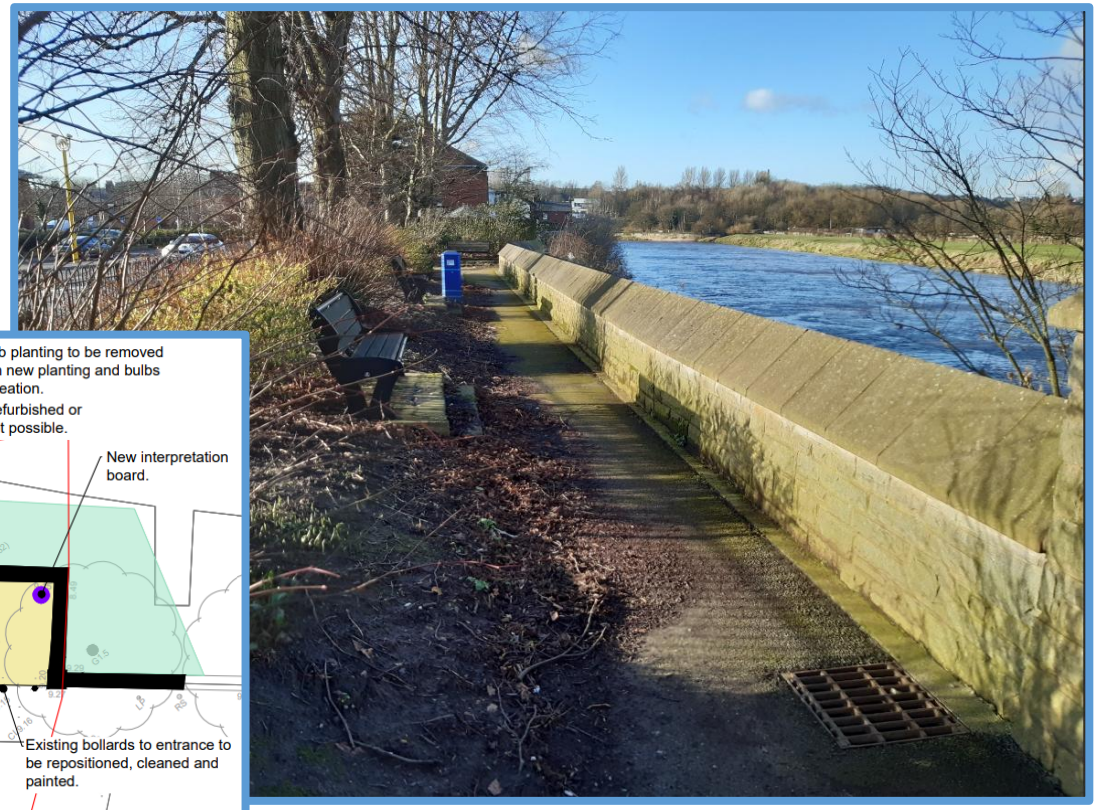
Old view of Broadgate Gardens

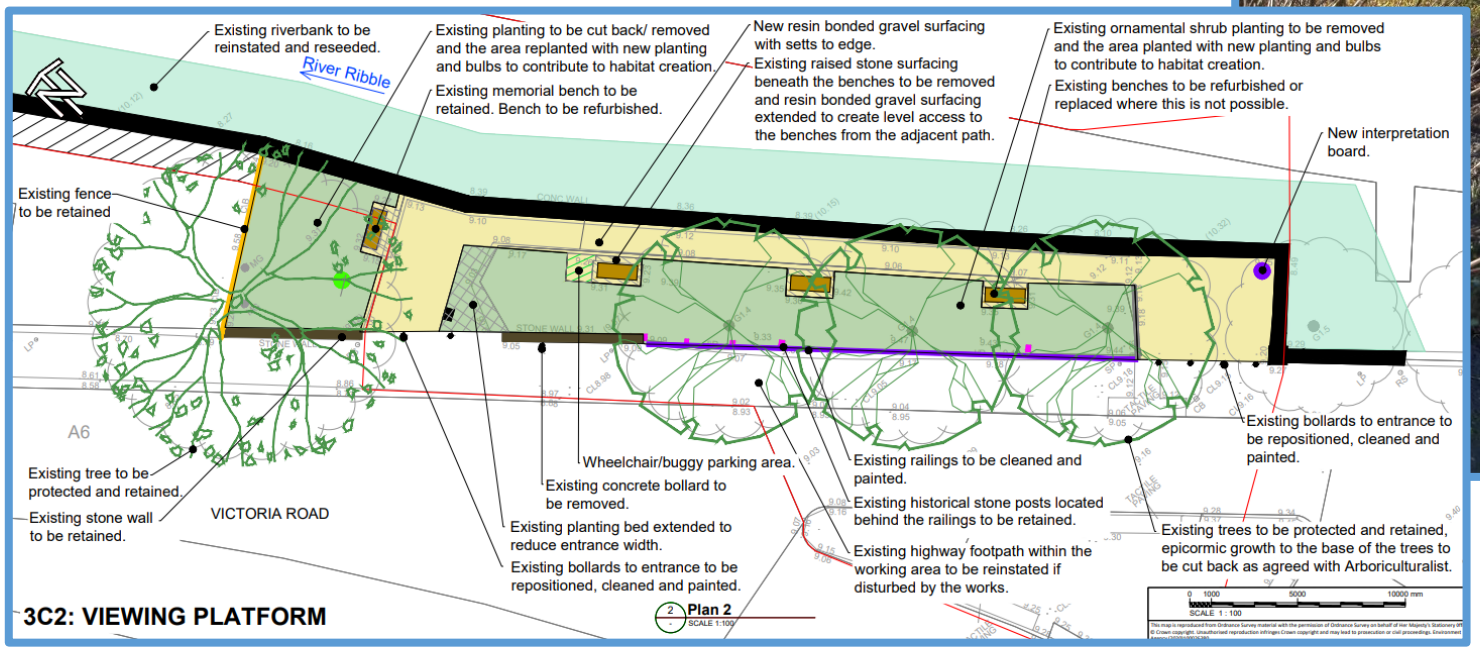
***Flower beds will become established over the next year…***

In Broadgate Gardens we have planted a mix of fruit trees and ornamental shrubs, and retained amenity grassed areas for residents to enjoy. Seating areas have been created in the centre with additional ornamental shrubs and bulbs. We have also restored the riverside viewing platform and added new seating.

# COMMUNITY BENEFITS
## Victoria Road Viewing Platform Refurbishment

As part of the Flood Scheme, the viewing platform along Victoria Road in Walton-le-Dale will be refurbished.





# Environmental Benefits

# ENVIRONMENTAL BENEFITS
## Landscaping & Planting

Detailed landscape plans have been developed for the Flood Risk Management Scheme, carefully designed to suit the unique character and conditions of the sites. In the wetter areas, moisture-loving plants have been selected, while native species have been prioritised where possible. In some areas, such as Broadgate Gardens, formal and ornamental species have been used.

Over six hectares of woodland has been planted along the riverbank at Fishwick Bottoms. This initiative helps boost biodiversity and brings ecological benefits by improving water quality, storing carbon, and increasing the area's resilience to climate change.

Different native trees have been used to provide a range of habitats, from open woodland consisting of mainly taller tree species like oak, birch and alder, to more dense woodland, which includes shrubs and smaller trees like holly and blackthorn.

Our planting and landscaping plans have been designed to improve the environment for some of our most threatened and well-loved species, such as bats and otters.

**Over 6 hectares** of woodland, wetland habitat, and recreational space

# ENVIRONMENTAL BENEFITS
## Tree Planting & Wildlife


Bee


Hedgehog


Damselfly


Bat

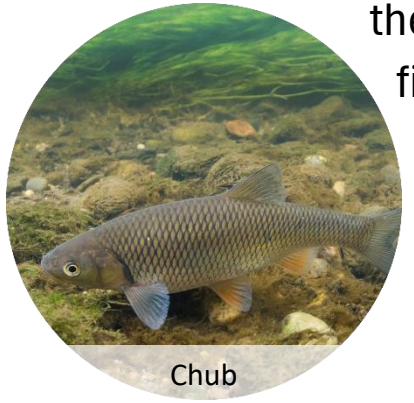

Otter


Vole

The Ribble Sidings wetland has been designed to attract invertebrates such as damselflies, dragonflies, butterflies, moths and bees. It will also benefit woodland birds, bats, hedgehogs, voles and amphibians, such as newts, frogs and toads.


Newt

Fishwick Bottoms is providing mitigation for the trees lost due to construction. The trees along the riverbank will provide shade and bank stability upstream of the flood defences. Once established, they will help water quality and benefit fish, as well as provide habitat for bats, otters and bird species.


Chub

We have also installed tree trunks and root plates, from trees that were removed for construction, along the south bank of the River Ribble, adjacent to the new wetland. This provides habitat and refuge for fish and benefits the local otter population.

# ENVIRONMENTAL BENEFITS
## Trees

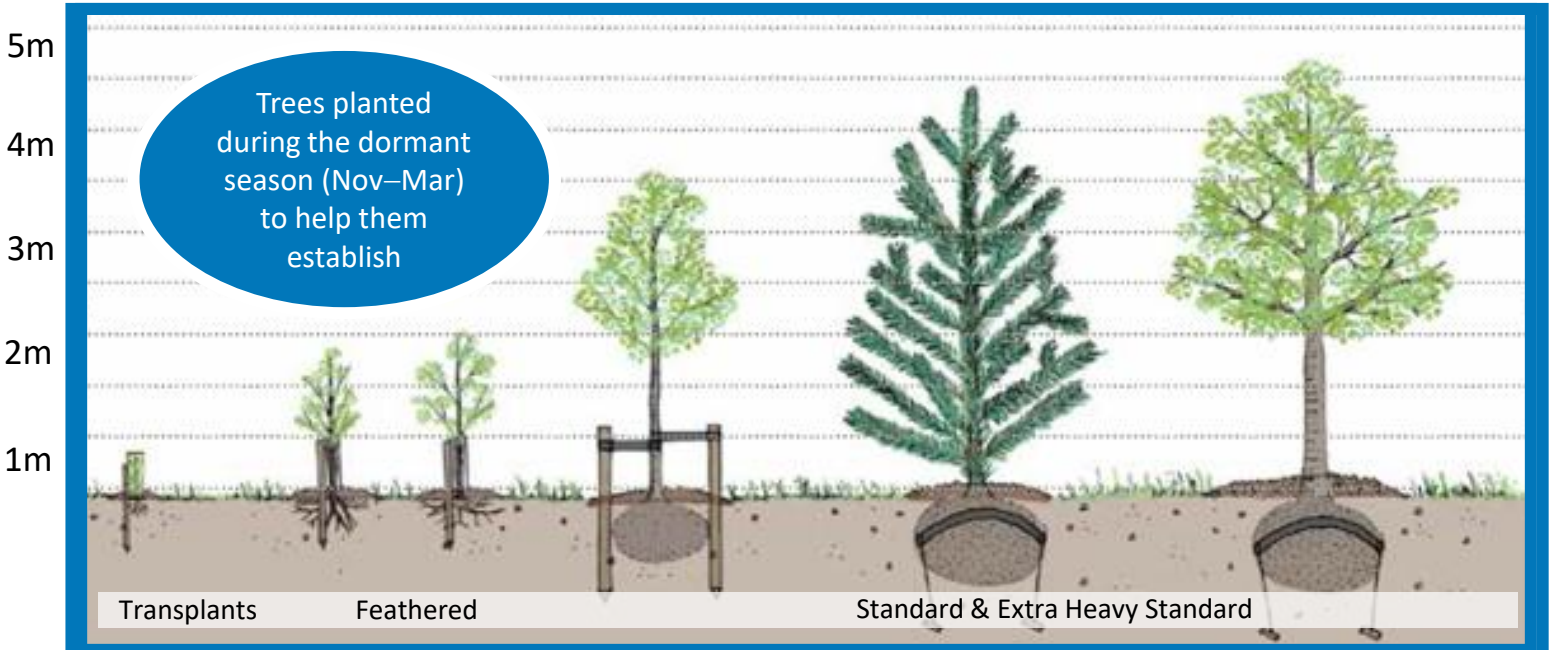
Some trees had to be removed due to their proximity to the new flood defences and to create space for construction to take place.

In most locations it has not been possible to directly replace the trees we have removed due to buried services (e.g. sewers, electricity cables, etc.) and the new flood wall foundations.

However, thousands of new trees have been planted to create a habitat-rich woodland at Fishwick Bottoms, with additional trees planted at Ribble Sidings, Golden Way, Broadgate Gardens, and other locations.

Different sizes and species of trees have been planted to serve different functions and to best suit certain locations. For example, native species are planted where habitat creation is important, while in Broadgate Gardens more ornamental species were selected to suit the character and purpose of the area.

Tree survival rates depend on many factors, including planting, soil condition and aftercare. If good practice is followed and weather conditions are normal, then a 95% survival rate is expected in the first year.



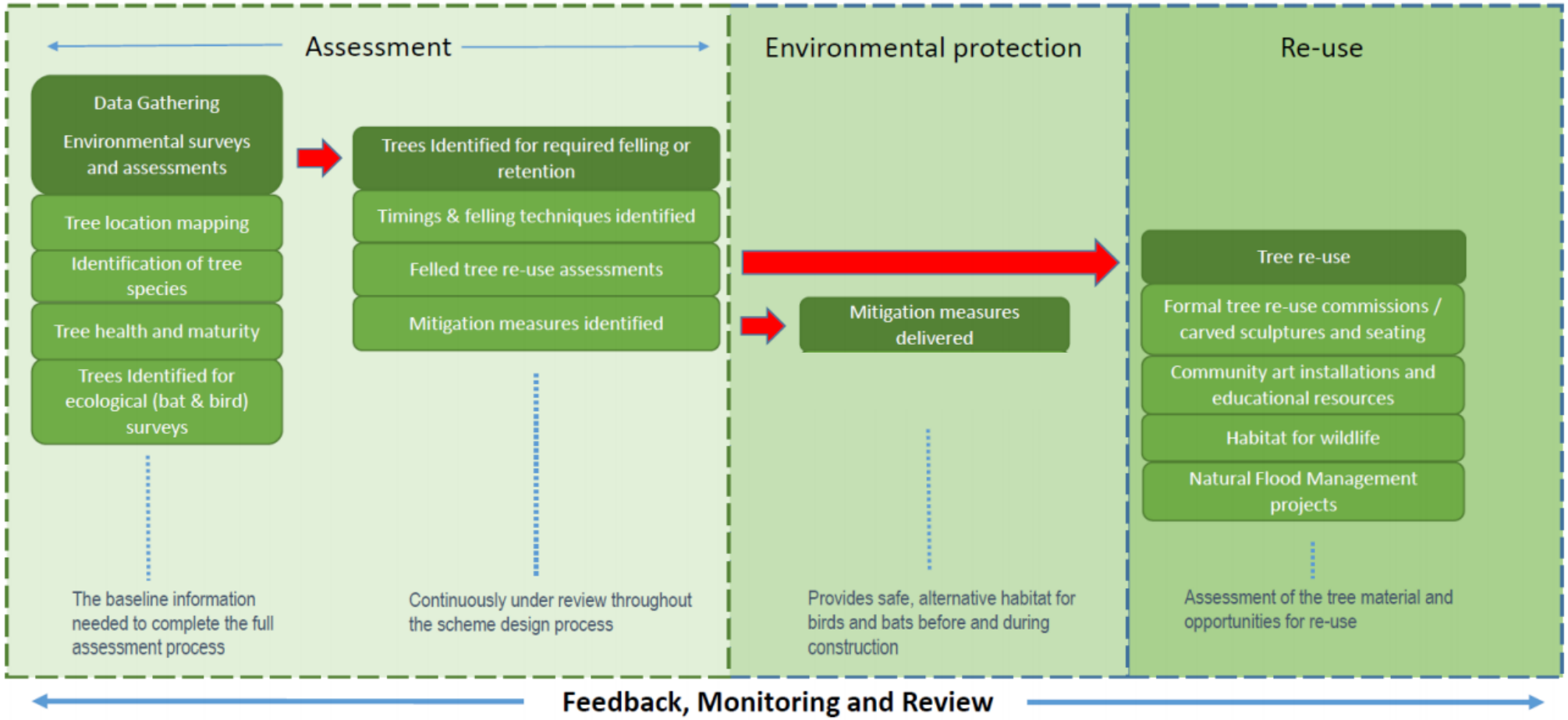

This table shows the various sizes of trees that will be planted.

- "Transplants" are the name for young trees that get "transplanted" from the seed bed.
- "Standard trees" are typically 2 metres tall with a clear stem supporting a well branched crown.
- "Extra Heavy Standard" are more established trees giving more immediate impact in the landscape.

| Technical name of tree size/form | Transplants | Standards | Extra Heavy Standards |
|---|---|---|---|
| **Total Number:** | Approx. 11,350 | Approx. 30 | Approx. 60 |
| **Location Use:** | Areas 1&2 (2,900)<br>Fishwick Bottoms (11,000) | Areas 1&2 | Areas 1&2 |
| **Planted Heights:** | Transplants: 40–60cm | Standards: 1.5m–2m | Extra Heavy Standards: 3.5–4m |

# Tree Assessment & Appraisal

The tree assessment process is ongoing throughout the design and construction phases.  As part of this process, mitigation measures are identified ahead of any construction works and options for reusing the wood from felled trees. One option is to create a sculpture trail along Fishwick Bottoms depicting local wildlife.



# ENVIRONMENTAL BENEFITS
## Biodiversity & Habitat Creation for Fishwick Bottoms


Oak

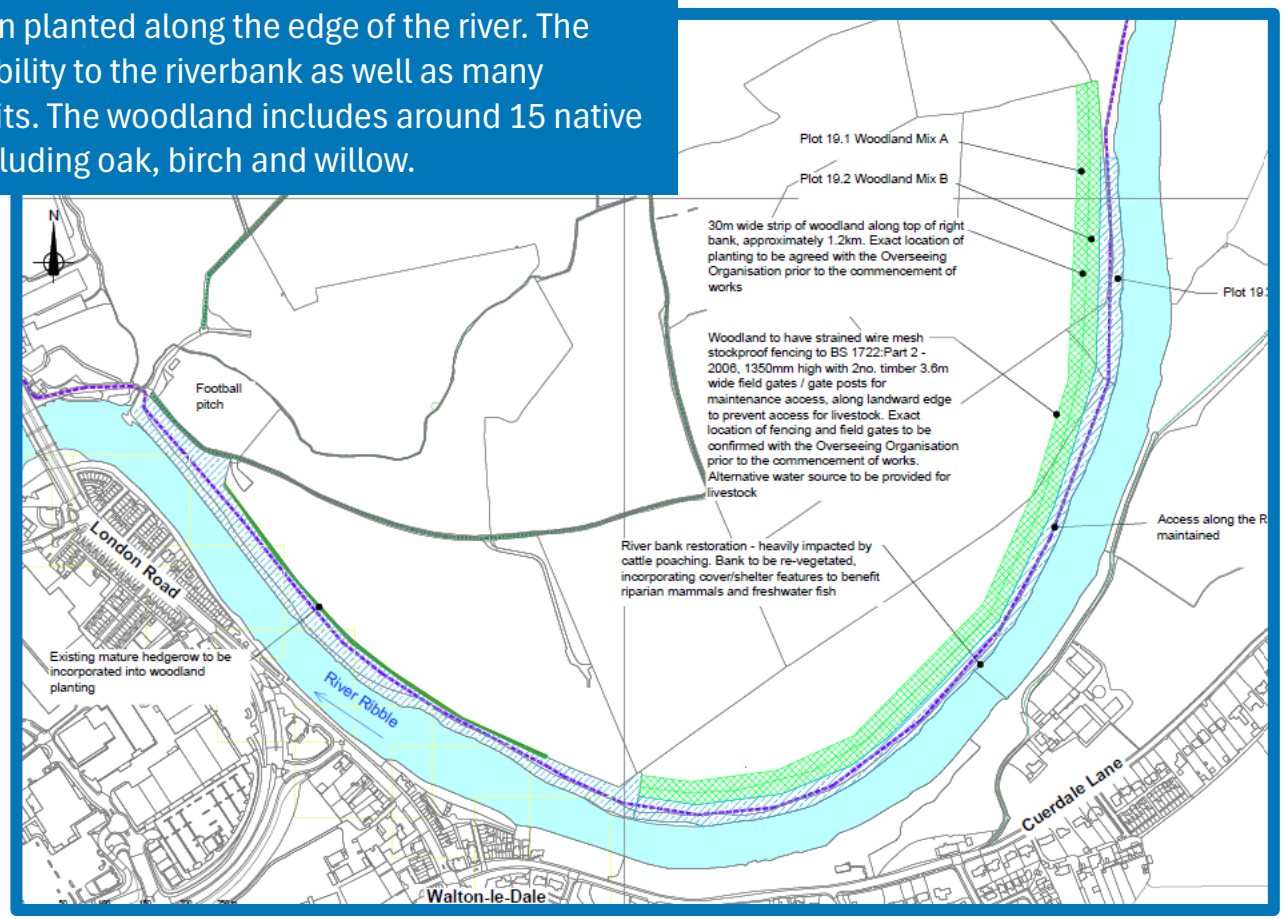

Hazel


Silver Birch


Hawthorn


Alder

At Fishwick Bottoms 8,450 trees and 1.2km of hawthorn hedges have been planted along the edge of the river. The trees provide stability to the riverbank as well as many ecological benefits. The woodland includes around 15 native trees species including oak, birch and willow.





Grey Willow


Wych Elm


Crack Willow


Blackthorn


Elder


Holly

# ENVIRONMENTAL BENEFITS
## Biodiversity & Habitat Creation for Ribble Sidings

Downy Birch



Alder

Willow

Hazel

### Native trees

### Native wildflowers

Loosestrife

Common Valerian

Marsh Marigold

Around 200 native trees alongside hundreds of wildflowers have been planted at Ribble Sidings to complement the riverside setting and to provide food and shelter for wildlife.

# ENVIRONMENTAL BENEFITS
# Biodiversity & Habitat Creation for Broadgate Gardens

## Shrubs, grasses & perennials


Fescue Grass


Ryegrass


Red Fescue


Dogwood
'Winter Flame'


Meadow Grass


Common Bent


Japanese Spirea
'Dart's Red'


Lamb's Ear


Oregon Grape
'Apollo'


Cinquefoil
'Abbotswood'


Bergenia
'Bressingham'


Japanese Spirea
'Little Princess'


Bergenia 'Siberlicht'


Daisy Bush


Verbena

These are some of the trees, shrubs, grasses, perennials, and bulb species that we have planted. Species are selected based on size and what will provide seasonal interest and value to wildlife, such as supporting pollinating insects and birds.

## Fruit trees


Cox's Apple


Conference Pear

## Native bulbs


Crocus


Snowdrop

# Construction

# SCHEME CONSTRUCTION
## Road Closures - Vehicle, Cycle & Footpath Diversions

Throughout the construction work, we will try to maintain access to residential properties and businesses.

Some of the working areas are compact, and we have to balance the need to keep everyone safe while minimising disruption to the community.

We will need to close some roads temporarily and put diversions in place. Where this is necessary, we will seek Temporary Traffic Regulation Orders. Pedestrian access to properties will be maintained for the duration of road closures.

There may be disruption to parking arrangements because of road closures. We will work closely with residents and businesses to address any accessibility requirements.

Traffic management plans are developed in conjunction with Lancashire County Council Highways.

# SCHEME CONSTRUCTION
## Working Arrangements

### Construction

Construction will be challenging in some areas as there are small / restricted working areas, works will be close to properties and underground services, and ground and physical conditions have led to a complex design.

### Working hours

The working hours are 8am to 6pm Monday to Friday and 8am – 2pm on Saturdays. Some construction activities once started must be completed, and this may mean work occasionally continues beyond 6pm. If possible, we will advise residents before any weekend working.

### Minimising construction noise & dust

Some noise and dust will be created during construction. We will monitor and manage noise, vibration, and dust levels and we will work to reduce impacts on homes, businesses, public areas, and the natural environment wherever possible.

To manage any debris on the roads, created by construction traffic, cleaning of the carriageway will be undertaken by a road sweeper or similar, as required.

# SCHEME CONSTRUCTION
## Areas 3 & 4 Construction Methodology

Working areas will be secured using Heras-type fencing or similar.

In areas where we are working in close proximity to properties, smaller plant machinery will be used to reduce impact, where possible.

The expected construction activities are:

- The addition of glass panels to existing flood walls in the Ribble Crescent area.
- Pile foundations and new flood walls on and near the Victoria Road viewing platform.
- A new flood wall at the rear of properties near HPH's haulage yard, off Chorley Road.
- A new raised embankment at Blue Bridge, off Higher Walton Road.
- Maintenance of existing flood defences in Frenchwood, Walton Green, and other areas.

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# MORE INFORMATION
## Contact Us

Visit our website: www.thefloodhub.co.uk/psr

Follow us on X and Instagram: @EnvAgencyNW

Email the team: psr@environment–agency.gov.uk

Download the Engage app:

Use the QR code below to download or visit your app store and search ‘VolkerStevin Engage’. You can also use the app to ask questions and to provide feedback.

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