

## Introduction

These display boards provide an update on proposals for the Bridgwater Tidal Barrier Scheme.

The Environment Agency and Sedgemoor District Council have been working together to develop these proposals to reduce the risk of flooding in Bridgwater and the surrounding area. These works are important to protect property from flooding and support the future development of Bridgwater. Funding and support for this project comes from:

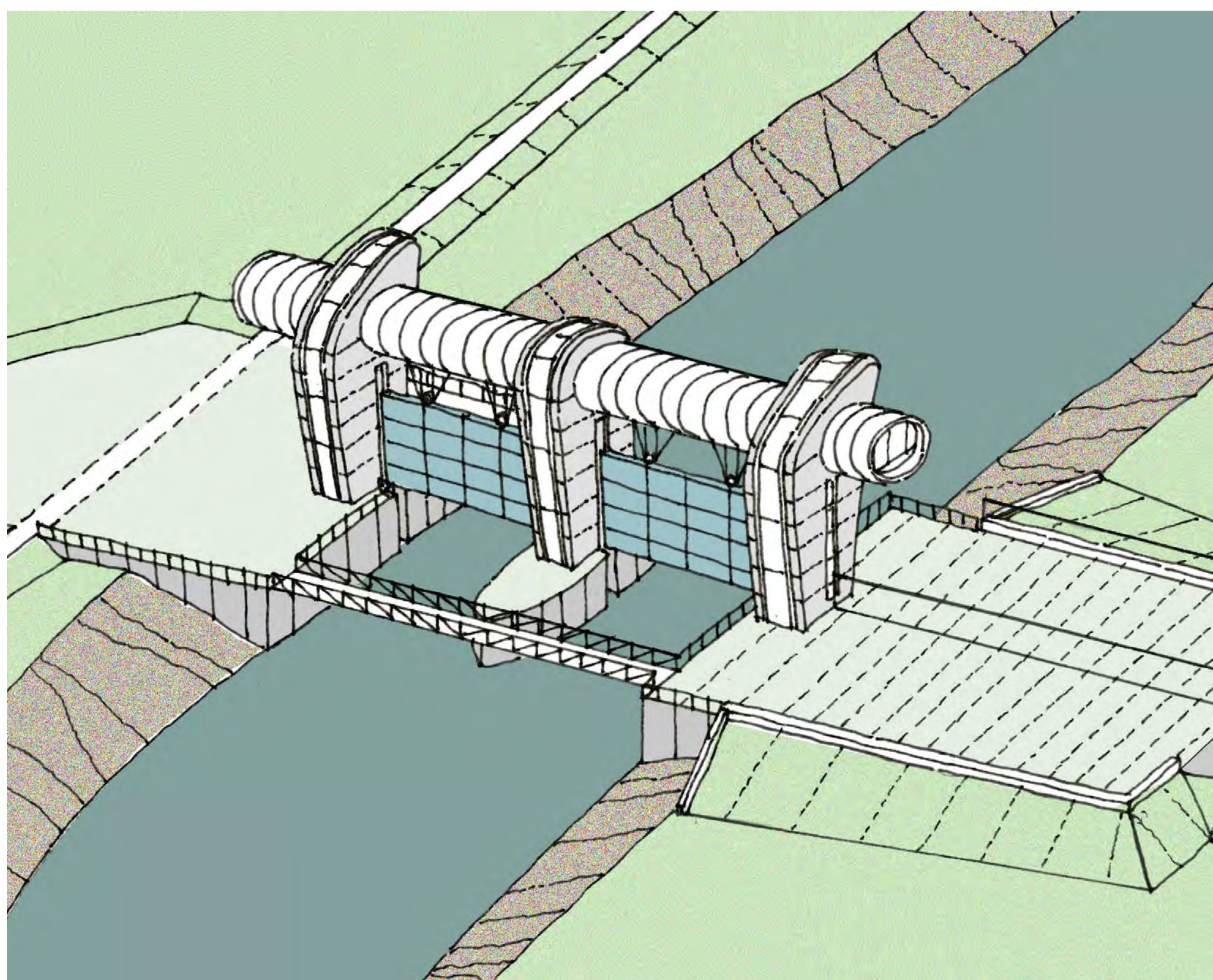


HM Government

## Background to the scheme

The construction of a tidal barrier at Bridgwater is a key component of the 20 Year Flood Action Plan, which was developed after the 2014 flooding. The Environment Agency has been tasked with developing proposals and securing funding for a barrier which can be operational by 2024. Alongside the barrier, improvements to other flood defences downstream are proposed.

Since our last exhibition in July 2017 we have been developing and refining our proposals, taking into account the feedback that was given. We can now share more details of what we propose to build and what it could look like.



*This image shows how the barrier could look.*

## What can you comment on?

This is the final time we will formally share our proposals before we apply for consent to build the scheme. We would welcome feedback on:

- The details of the proposals for both the barrier and the downstream flood defences.
- How you think the proposals may affect you, your land or your business.
- What additional improvements you would like to see delivered as priorities, in addition to the barrier and the downstream flood defences, subject to funding.

We will use your comments to help us make final refinements to the proposals. Please ensure your feedback reaches us by:



## Overview of proposals

### The tidal barrier

The barrier will be a large gate structure across the River Parrett between Express Park and Chilton Trinity. It will have two 'vertical lift' gates that will be closed when a tidal surge is forecast. This will prevent the tide travelling upstream and overtopping defences and flooding property and infrastructure.

### Downstream flood defences

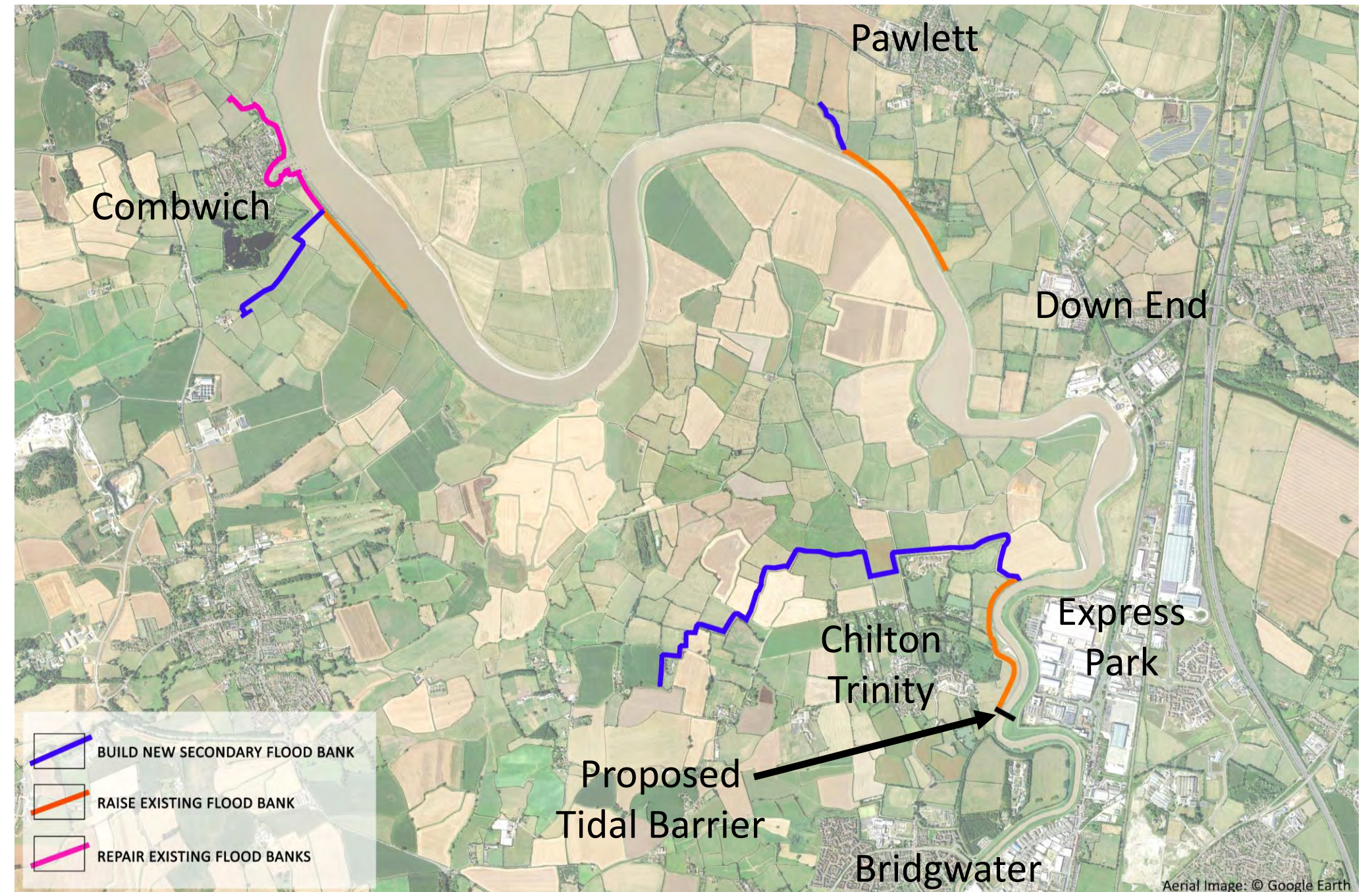
Flood defences will be required downstream of the barrier to prevent flood water bypassing the barrier and to better protect the villages of Combwich, Chilton Trinity and Pawlett, the A38, the railway and farmland. We will improve the existing flood defences and build new secondary defences.

### Wider enhancements

A pedestrian and cycle bridge across the River Parrett and improvements to public realm will be included as part of the barrier scheme. However, an important part of the project is to identify other opportunities to deliver wider environmental, economic and social benefits alongside the flood risk management benefits, subject to funding and approvals.

#### How much will the works cost?

The current cost estimate is around £100 million. This includes the cost of the barrier and the downstream flood defences, but excludes the wider enhancements, which will depend on additional funding.



This shows the location of the proposed barrier and the downstream flood defence works.

### Manging flood risk

Climate change and sea level rise will mean the risk of flooding will increase in the future. These works will help to better manage this risk.

**11,300**  
homes and



**1,500**  
non-residential  
properties...



...will benefit from enhanced flood  
protection.

Bridgwater and the surrounding area will be better protected against a severe flood by building the barrier and improving the downstream flood defences. These works will also maintain the current standard of defence to agricultural land.

## The barrier – buildings and layout

Previously we assumed all the operational buildings associated with the barrier would be located on the riverbank. However, we have purchased a site on Express Park and now plan for the operational buildings to be located here instead.

We can locate the buildings more discreetly on Express Park and there is also space for expansion if required in the future. For example, there could be space for a future visitors facility or visitors parking.

A bridge, for pedestrians and cyclists, is an important part of the scheme. This will help to link existing walking and cycling routes on either side of the river and aligns with the aspirations set out in Sedgemoor District Council's Green Infrastructure Plan.

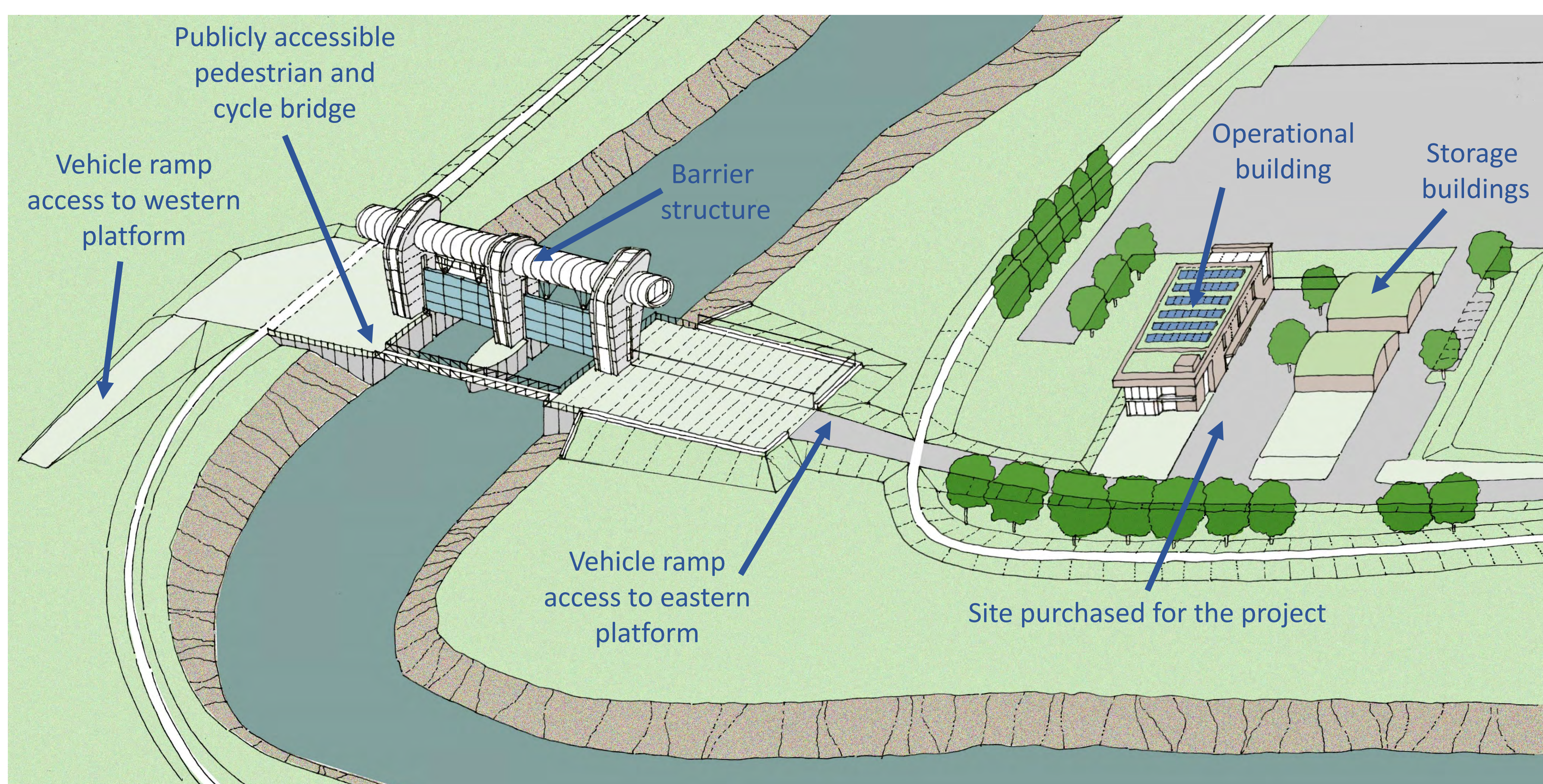
A road bridge is not included as this would have increased the complexity and cost of the project and reduced the certainty of delivery.

### When would the barrier be used?

When a tidal surge is forecast the barrier gates will be closed until the high tide has passed. We anticipate, based on predicted tides, that the barrier will be operated around 5 times a year for flood protection and up to 25 times a year for maintenance. Over time the barrier may be used more as sea levels rise.

### Will the barrier be used to generate electricity?

It will not be possible to use the barrier to generate tidal power. However the operational buildings will be sustainably designed and will have solar panels.

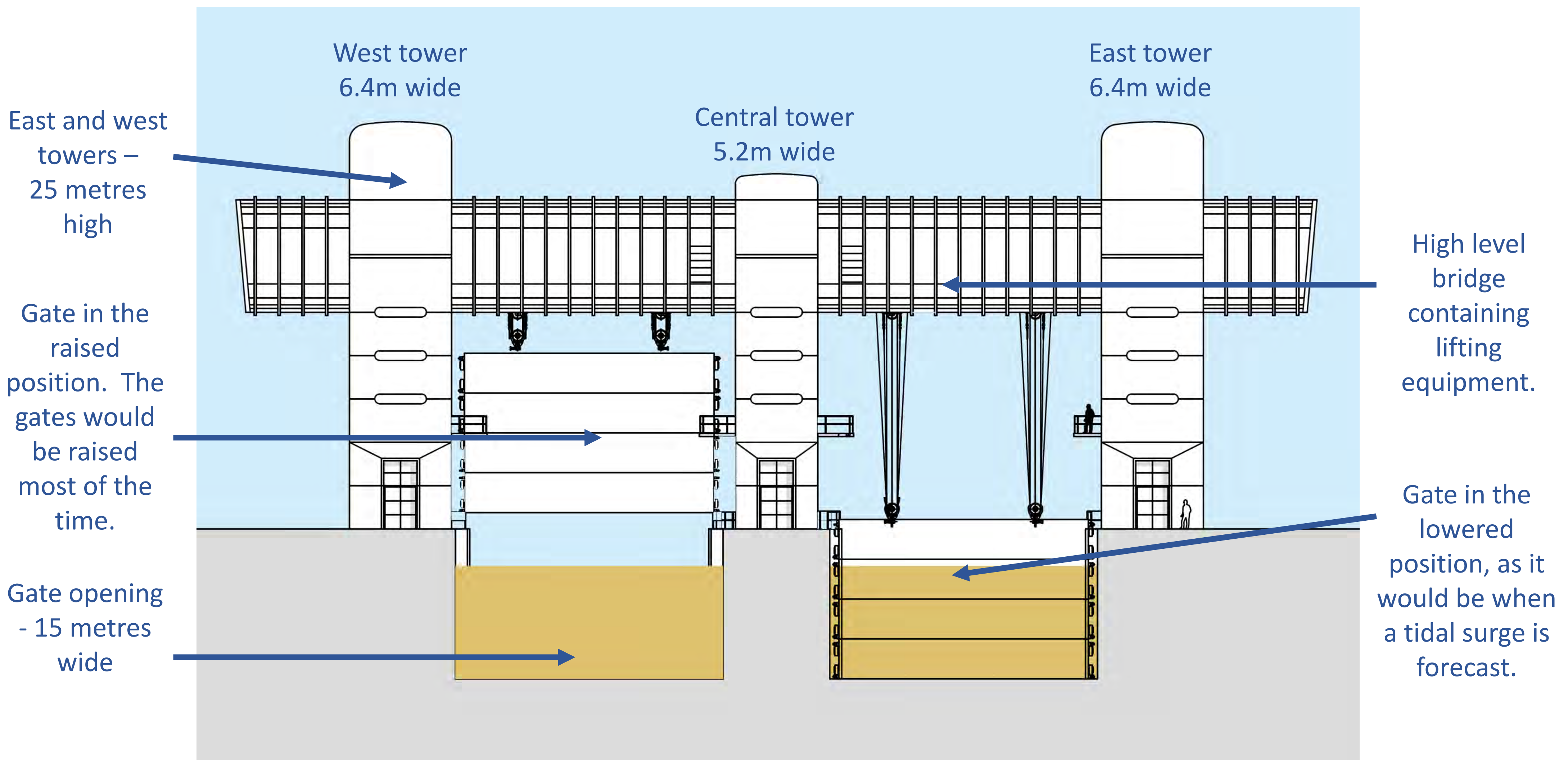


*This shows how the barrier will be positioned relative to the operational buildings on Express Park.*

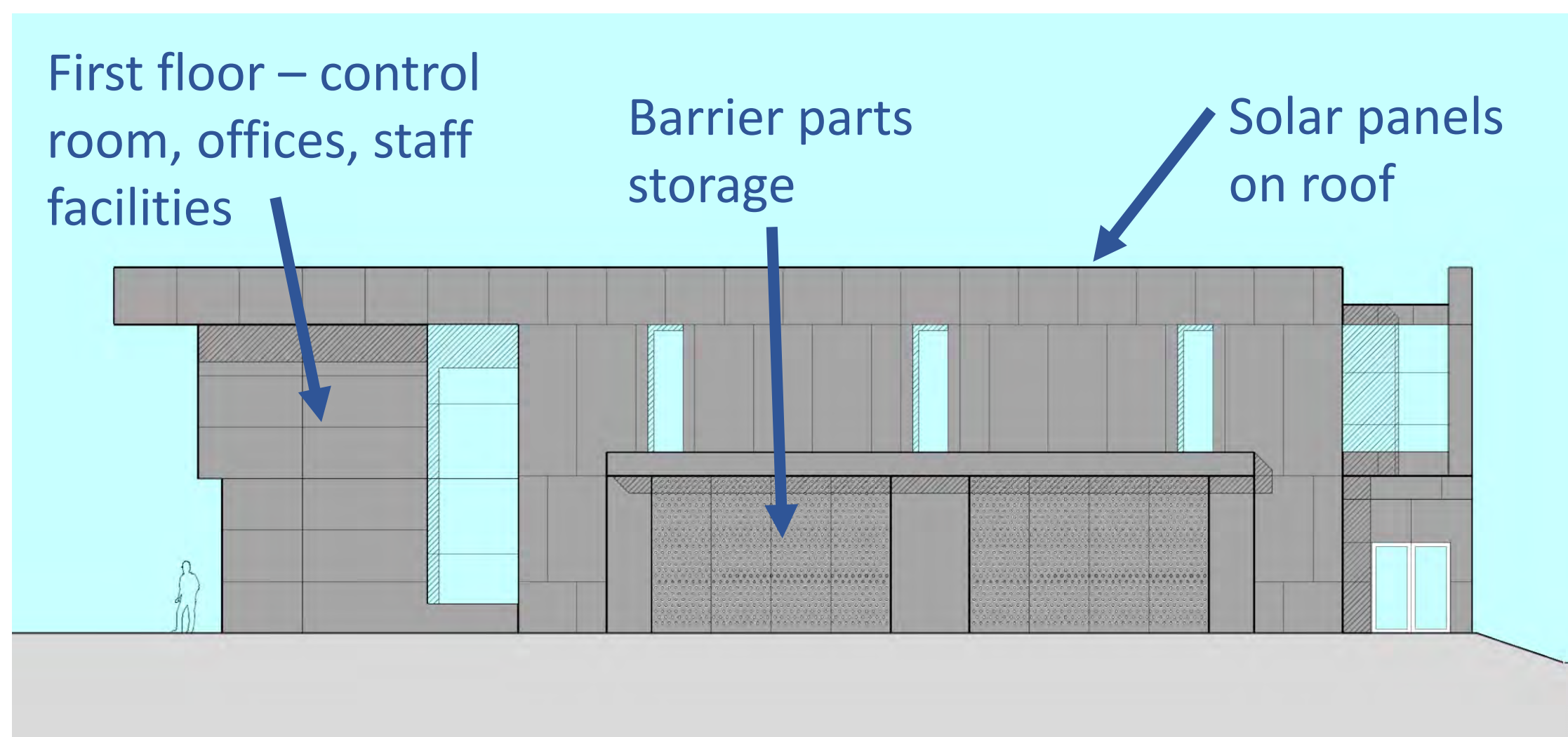
# The barrier – structure and appearance

We have explored a range of options for the architectural design of the barrier. We will continue to refine the details, but now have a preferred design. This has been evolved taking into account previous feedback. The design strikes a balance between functionality, affordability and design.

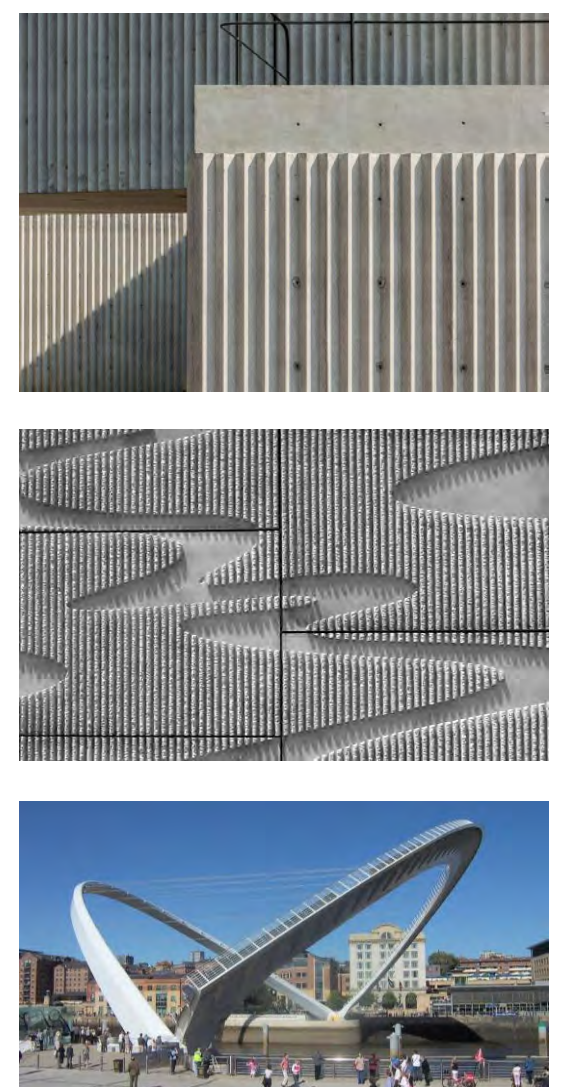
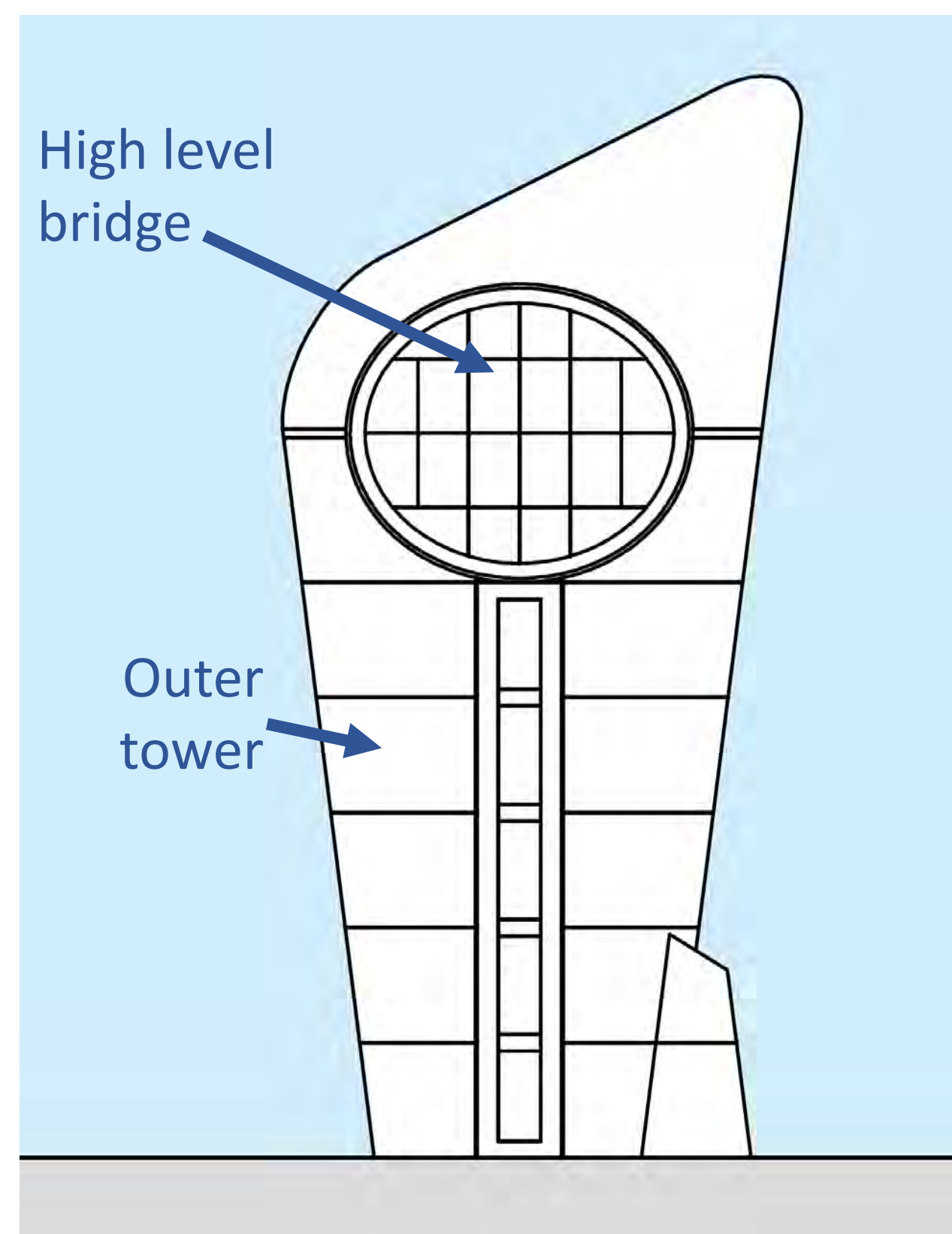
Three towers will support a high level bridge and two vertical lift gates. The towers will be 25m high, equivalent to a 6 storey building. They could be constructed from white pre-cast concrete and white painted steel. The overbridge could be clad with white painted aluminum panels.



*This shows what the main barrier structure could look like.*



*This shows what the operational building could look like and the types of materials/cladding that could be used.*



*These indicate the types of materials that could be used.*

*This shows the form of the barrier towers.*

## The barrier – access and work areas

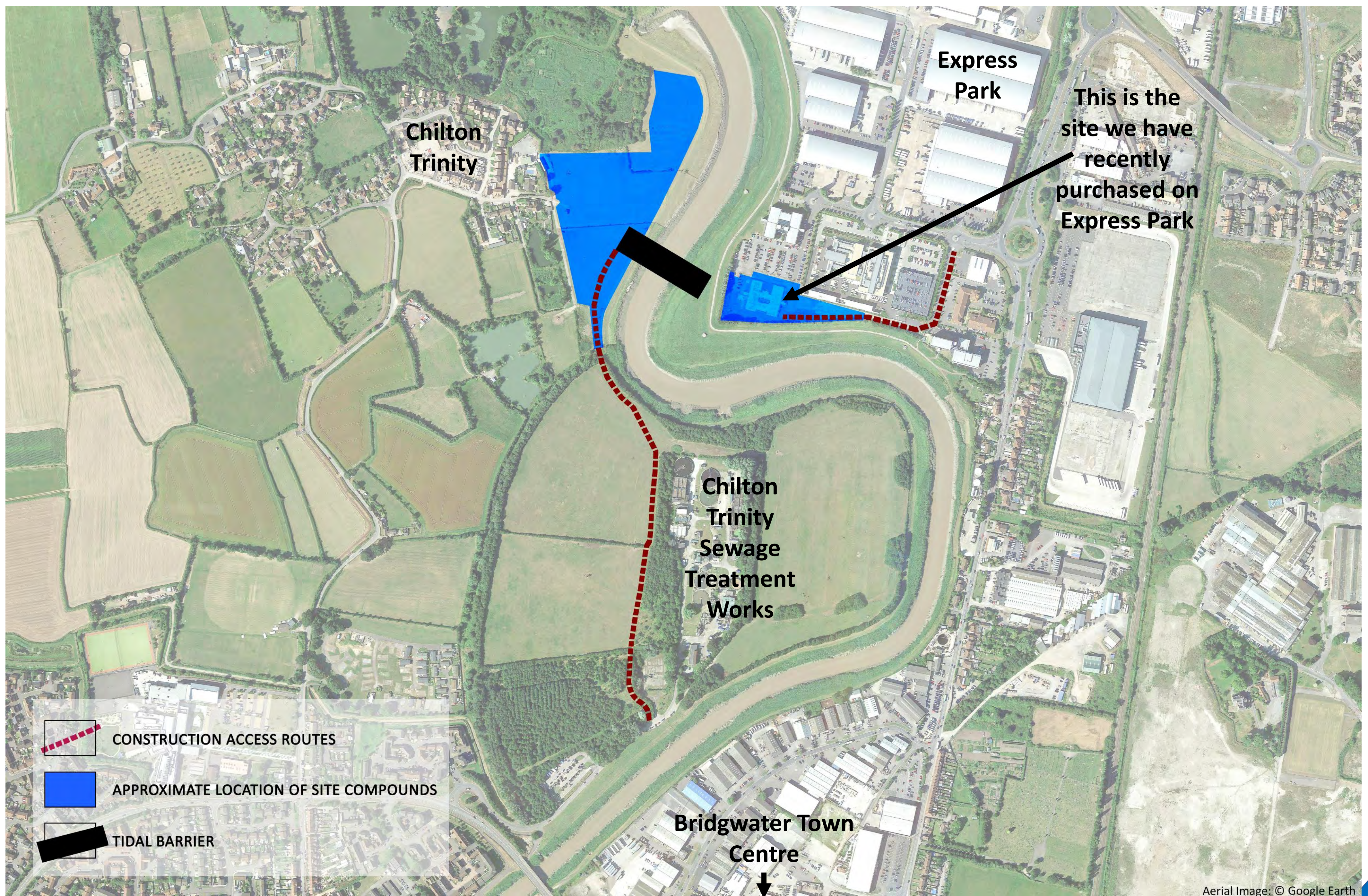
We will need to access the barrier site from both sides of the river during construction and also to operate and maintain the barrier in the future. We will need to create permanent access routes to do this.

We will build a new access track on the west bank. Discussions with Somerset County Council are ongoing regarding a route past the sewage treatment works to the barrier site. This will help to reduce traffic movements on the local road network. We recognise the need to minimise impacts to Chilton Trinity and will continue to liaise with residents and the Parish Council. On the east bank we will access the site through Express Park and will liaise with businesses here.

We will need to set up temporary site compounds to store equipment and materials during construction. We will use the Express Park site on the east bank and hope to secure a compound adjacent to the barrier on the west side, subject to landowner agreement. We may also use land adjacent to the sewage works.

### What impact will there be on local roads?

We recognise that construction of the barrier could cause disruption in Bridgwater. We will work with the local Councils and our contractor to minimise disruption.



*This shows the working areas and access routes for the barrier.*

## Downstream flood defences – overview

### Why are works required?

Improvements to the flood defences downstream of the barrier are required to:

- Prevent flood water in the flood plain bypassing the barrier in extreme events.
- Reduce flood risk to Chilton Trinity, Combwich and Pawlett in the long term.
- Maintain the current standard of protection to agricultural land in the flood plain.

### What is proposed?

The downstream flood defence works will involve a combination of:

- **Repairing some of the existing defences** - at Combwich we will undertake targeted works to raise parts of the defence that are currently low.
- **Raising some of the existing tidal flood banks** - we will strengthen, improve and increase the height of the existing flood banks at Chilton Trinity, Pawlett and Combwich. This will protect property by reducing the volume of water that spills into the floodplain during extreme high tide events.
- **Building new secondary flood banks** - these will be located at Combwich, Chilton Trinity and Pawlett. These will be set back from the river and located at the edge of the floodplain to protect communities from flooding during high tides. The banks will also prevent floodwaters bypassing the barrier and flowing into Bridgwater.
- **Maintaining existing banks** – as part of the long-term flood risk management strategy, the Environment Agency intends to continue to maintain and improve the existing primary flood defences to their current standard of defence, including an allowance for sea level rise for the foreseeable future. This may mean that some flood banks have to be completely rebuilt, like the recent Cannington Bends project. There are no plans to remove any of the existing tidal flood defences.

Diagram 1

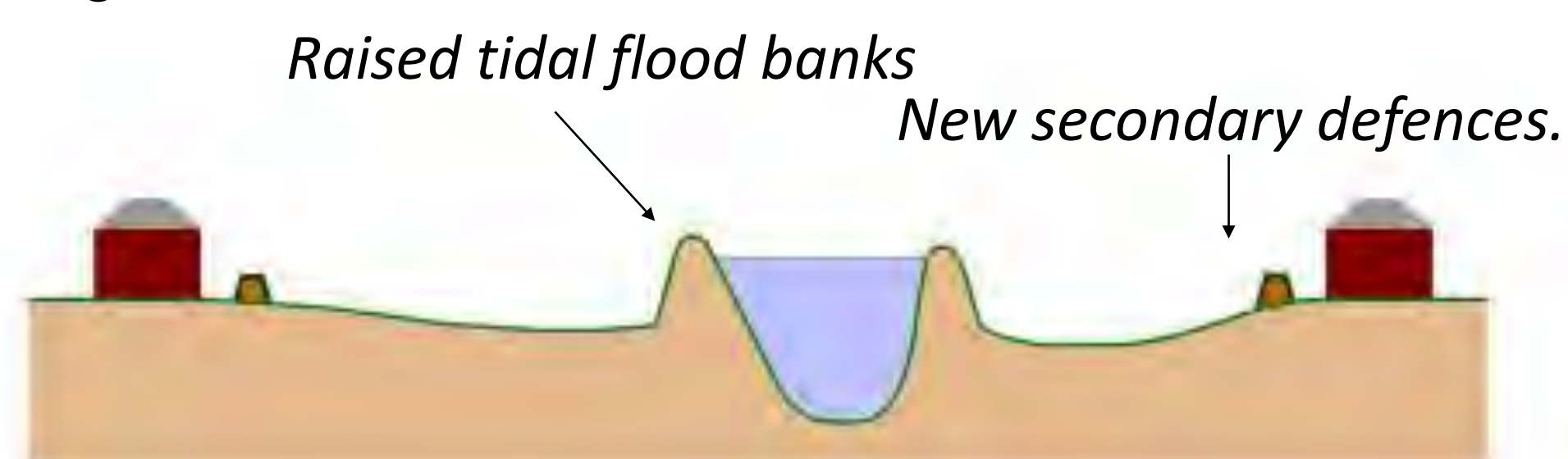


Diagram 1 shows how the tidal flood banks would continue to protect land during most high spring tides.

Diagram 2

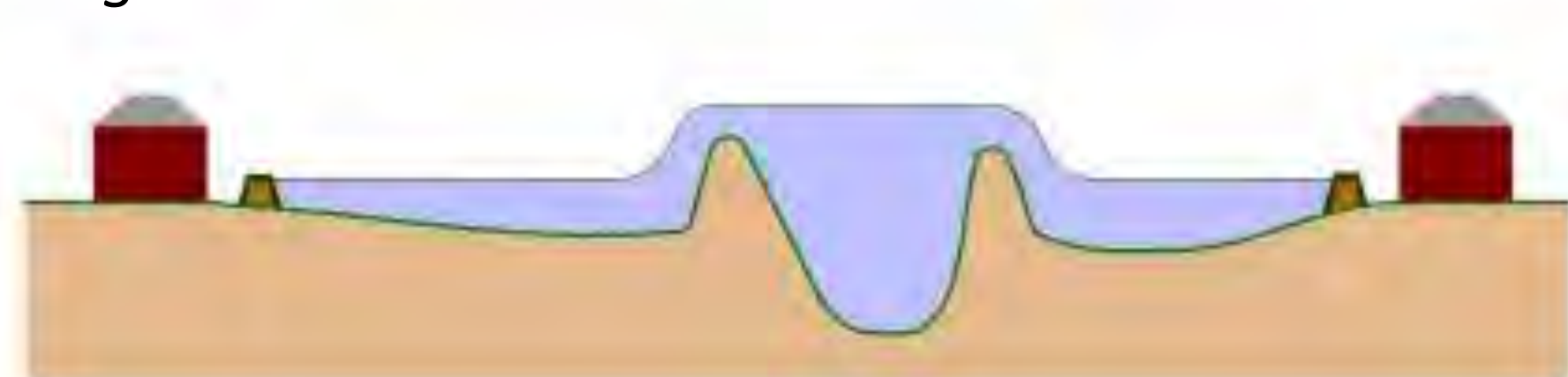


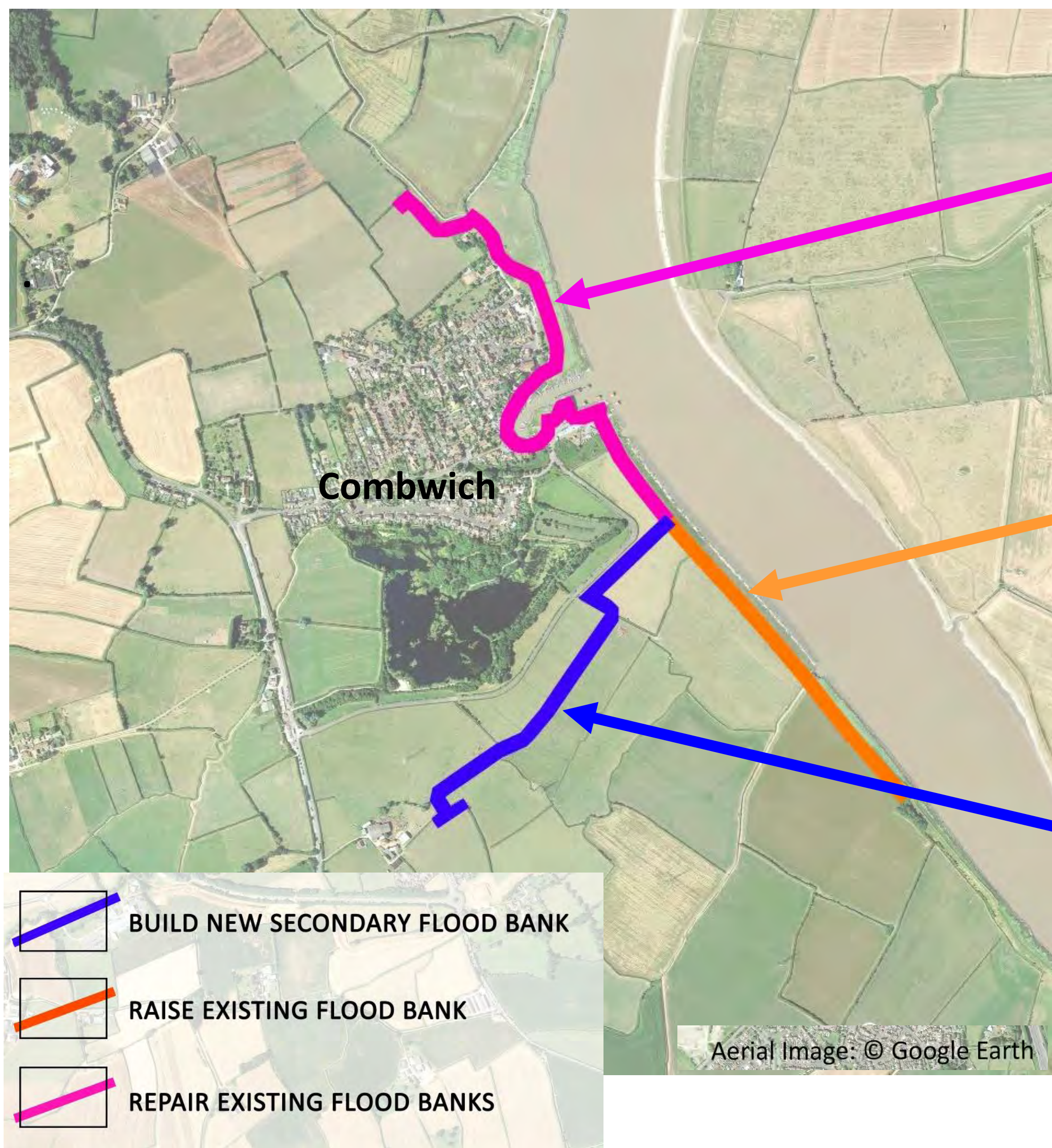
Diagram 2 shows how the secondary defences will reduce risk to communities and property during tidal surge events.

# Downstream flood defences – proposals

## Combwich

We have worked with local residents to identify the right solution for Combwich. Initially we discussed the option of raising the flood defences around the village. However, residents expressed some concerns about the impact this may have on their views.

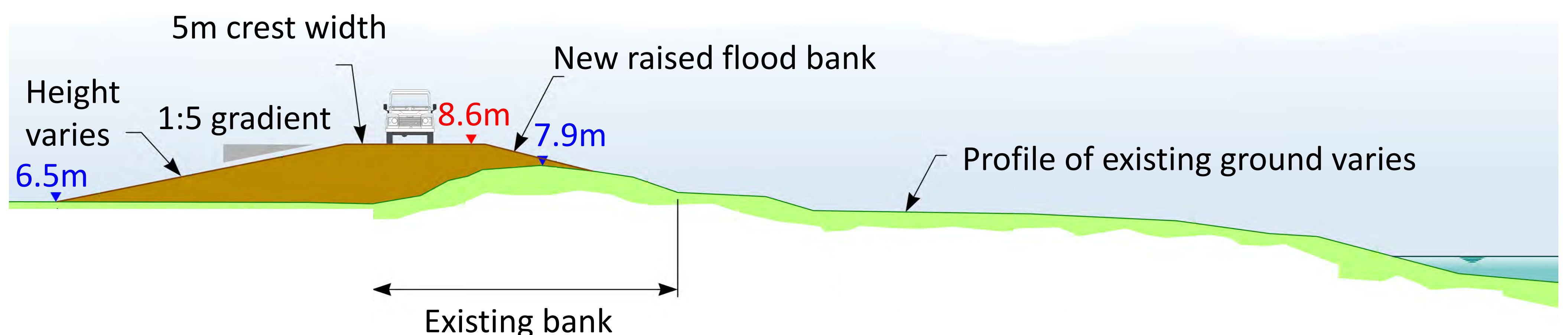
Our revised proposals instead focus on making repairs where the crest of flood embankments has settled or been eroded below the original design level. This approach is more cost effective, will avoid impact on views and will still help to better manage the risk of a severe flood. South of the village we will raise the existing flood banks and build a new secondary flood defence.



Around the edge of the village we plan to repair and raise low spots in the existing defence.

South of Combwich we would raise the existing tidal flood bank, by 0.5 to 1 metre.

South of Combwich we would build a new secondary flood bank. This would be around 1km long, and extend out to Putnell Farm. It would be around 1.5 metres high.

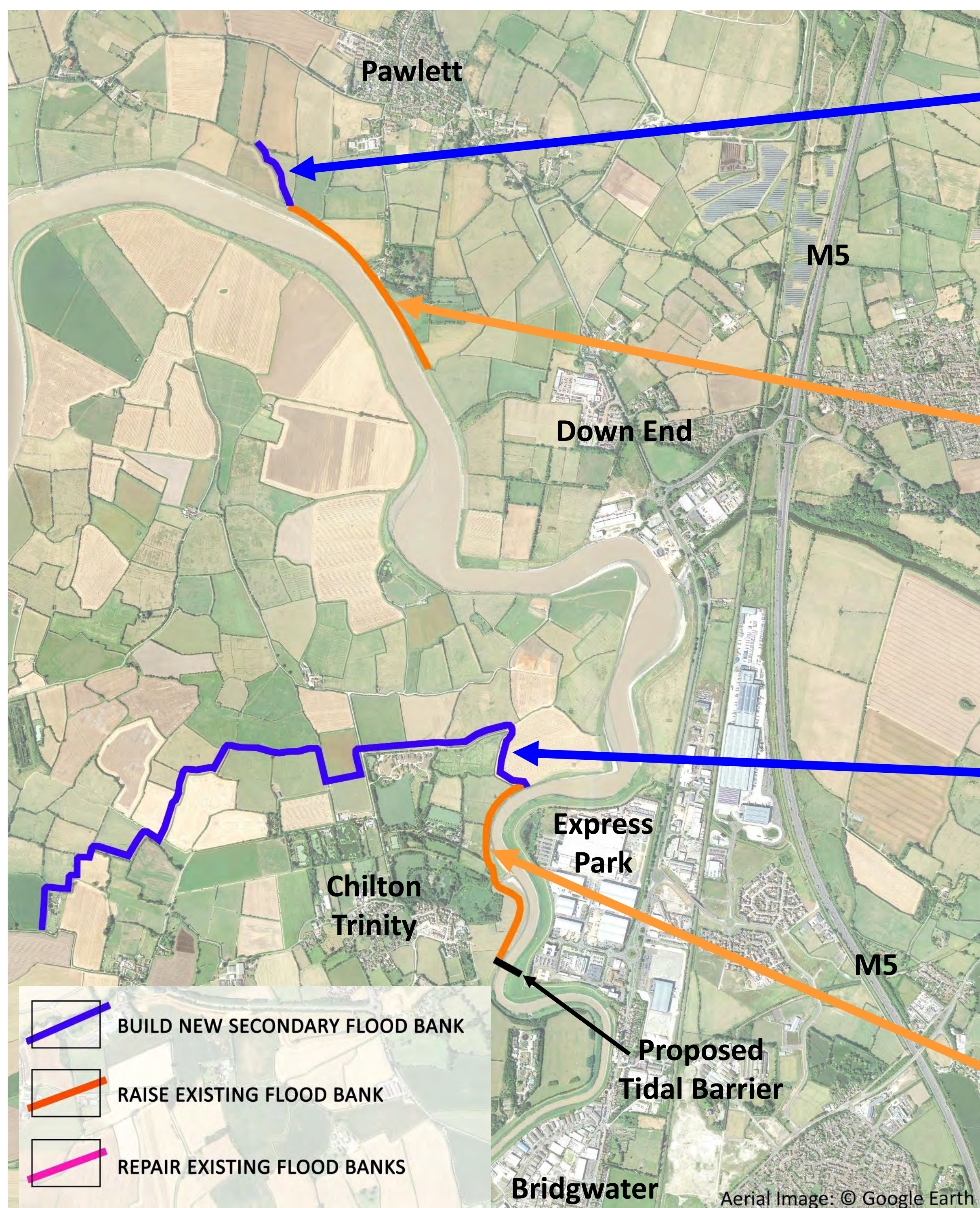


*This diagram shows how the existing flood banks will be raised. The heights of the banks will vary from place to place, depending on topography. This shows bank south of Combwich, by way of typical example. The red number is the level of the new raised bank and the blue numbers are the levels of the existing ground.*

# Downstream flood defences – proposals

## Pawlett and Chilton Trinity

The diagram below shows the proposals for Pawlett and Chilton Trinity. Works to Dunball and Bibby's Wharf were previously considered, but are now proposed to be undertaken at a later date.

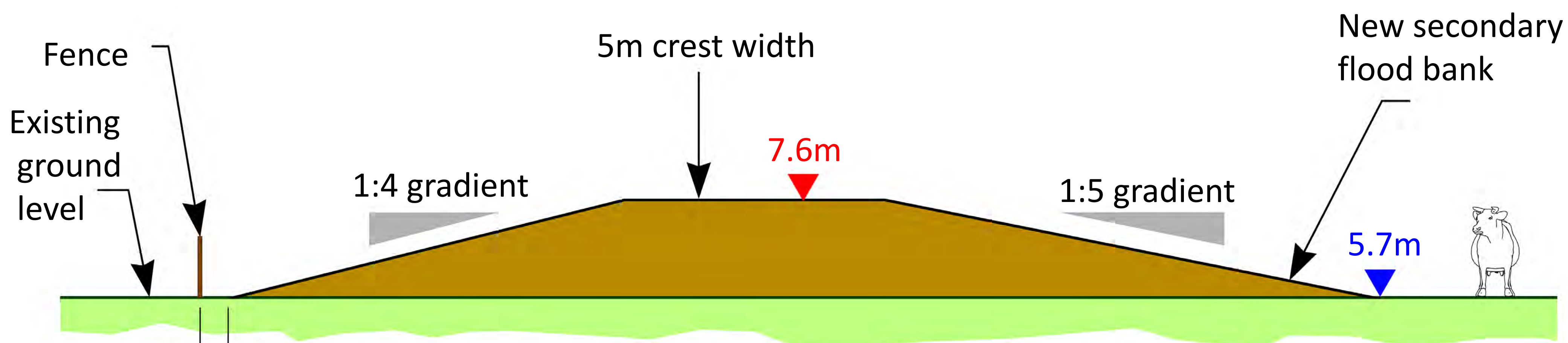


South west of Pawlett we need to build a new secondary flood bank. This would be around 500 metres long and 2 metres high.

Along the River Parrett we need to raise the height of the existing tidal flood banks and walls by between 0.5 and 1 metre along about 1km of the riverbank.

North of Chilton Trinity we need to create a new secondary flood bank, extending out to Perry Wood Farm. The height would vary to fit with the topography, but would be on average 1.5 to 2 metres high.

East of Chilton Trinity the existing tidal flood banks need to be raised by between 0.5 and 1 metre.



This diagram shows the new secondary flood banks. The heights will vary depending on topography. This shows the level of the bank to the north of Chilton Trinity by way of example. The red number is the level of the new bank and the blue is the level of the existing ground.



## Environmental impacts

The proposals for the Bridgwater Tidal Barrier Scheme have been developed, from an early stage, to minimise adverse impacts on the environment, land use, use of the river and the local community. We have also sought to maximise opportunities for enhancement.

We continue to prepare our Environmental Impact Assessment (EIA) as agreed with the statutory stakeholders, which will be reported in an Environmental Statement. This is an important document required as part of the consenting process.

Here we provide an overview and update of the key environmental aspects, including topics discussed at previous consultations.

### Landscape and visual amenity

Consideration of landscape and visual impact has influenced the scheme design from an early stage, including the positioning of the buildings, architectural design and choice of materials.

We are continuing to develop proposals for landscaping in the area immediately around the barrier. Board 11 shows what the proposals could offer to enhance the public realm in this location.

### Will the barrier affect navigation?

The barrier gates will be open most of the time and it will still be possible for boats to pass through. The barrier will reduce the width and height clearances due to the central pier and open gates. However, the clearances provided are greater than some of the bridges upstream.

### Silt

We have considered the effects of the barrier on silt and sediment within the River Parrett. In the short term, the operation of the barrier is unlikely to result in any change beyond the natural variation of silt levels in the river. However, in the future when the barrier might be operated more frequently as a result of sea level rise there could be impacts. We will monitor this situation so that we can introduce mitigation if needed.

### Noise

We are undertaking a noise assessment, informed by recent monitoring. This is feeding into our Environmental Statement which includes consideration of construction phase impacts on local residents and birds. We do not anticipate there to be any significant noise impacts during the normal operation of the barrier.

The artist's impressions give an indication of the extent to which the barrier will be seen from key locations.



View from Puriton Hill.  
Distance to barrier, 2.6km.



View south east from embankment footpath.  
Distance to barrier, 380 metres.



View from Chilton Trinity.  
Distance to barrier, 150 metres.

## Environmental impacts (continued)

### Land use

By locating the operational buildings required for the barrier on Express Park we will minimise the land take required on the riverbank and instead make use of a previously developed site.

We need to use some land to raise and construct the downstream flood defences. This will directly affect some landowners. However, it will not significantly impact land use or farming practices. We are liaising with landowners and will ensure farm accesses are maintained.

### Construction traffic

The works will require construction vehicles to access the various sites. Our Transport Assessment will assess these issues and set out the steps we will take to ensure that disruption is kept to a minimum.

Where possible, we will excavate material locally from 'borrow pits'. This will minimise the need to bring in material to build the new downstream flood banks and reduce construction traffic.



*This image, of the flood banks at Cannington Bends, shows what the new and raised banks could look like. The lines indicate the profile of the bank.*

### Public rights of way

Some public rights of way will need to be diverted on a temporary basis during the works. A few public rights of way may need to be diverted on a permanent basis.

### Trees and hedgerows

Tree surveys have recently been completed and this information is being used to ensure we minimise any impacts, for example by adjusting the alignment of the flood defences where possible. In some places we will need to take out sections of hedgerow for the downstream flood defence works but we will re-plant either in their original locations or nearby.

### Ecology

Our Environmental Statement is supported by habitat and ecological surveys (including consideration of birds, water vole, otter and great crested newts). We have sought opportunities for habitat creation and enhancement where possible. For example, the borrow pits provide an opportunity to create wetland habitats to help promote and encourage wildlife and provide linkages between designated sites.

### Cultural heritage

We do not expect the barrier to impact on archaeology. However, at the borrow pit locations we are conscious of the need to avoid impacts on archaeology. We have completed a survey to understand what buried archaeology may be encountered. We have not discovered any specific interest but will continue to manage any risks as the project moves forward.

## Wider improvements

At the last exhibition we shared ideas for additional enhancements that could be delivered alongside the scheme, subject to additional funding, landowner agreement and consents. The feedback showed that improvements would be welcomed, particularly where these focus on enhancing the natural environment.

This feedback has informed our thinking and we are continuing to work with the community and stakeholders to identify opportunities which will deliver additional environmental, economic, and social benefits. These could be delivered at the same time as the barrier but do not form part of the core scheme for which we will be seeking consent. These ideas would support the Bridgwater Vision, which sets out a 50 year regeneration strategy for Bridgwater.

### Wetland habitat creation

In the areas where we excavate the material needed to build the downstream flood defences we have an opportunity to create wetland features that enhance biodiversity, landscape and amenity value. This would be part of a wider plan to create a network of green open spaces along the river, providing 'stepping stones' for species.



*This shows how the area could look following enhancements.*

### Cycleway and footpath links

There is lots of potential to improve existing routes and develop the existing network of paths for a variety of users, utilising the new bridge across the river. Routes could include themed walks, interpretation boards and art.

Overall we are looking at improving connectivity along the river corridor for the enjoyment of all. This could include improved links to areas such as Saltlands Community Woodland, Bridgwater Docks, and the Brick and Tile Museum.

### Future visitors facility

There is space within the site on Express Park that could be used in the future as a visitors facility. This could provide information and displays on topics such as climate change, the environment and local history.

### Lighting

At the last exhibition there were discussions about possible options for lighting the barrier as a feature. However, in response to concerns raised about visual impact, this is no longer proposed and basic functional lighting only will be provided.

### Riverside Park

We are looking at creating boardwalks (raised walkways) leading to viewing platforms and seating areas. These ideas are part of a wider plan to enhance the setting of the barrier, improve the waterside area and create a linked network of open spaces.

## Next steps

### Consenting process

A number of consents and permissions will be required to construct the tidal barrier and improve the flood defences downstream:

- An **Order under the Transport & Works Act 1992 (TWAO)**, as the barrier will impact upon navigation on the River Parrett.
- A **marine licence** from the Marine Management Organisation for works below the level of mean high water springs.
- The Secretary of State will be asked to grant **planning permission** for the construction of the barrier.
- **Planning permission** will be required for the works to improve the flood defences downstream; this will come through the TWAO or a separate planning application.

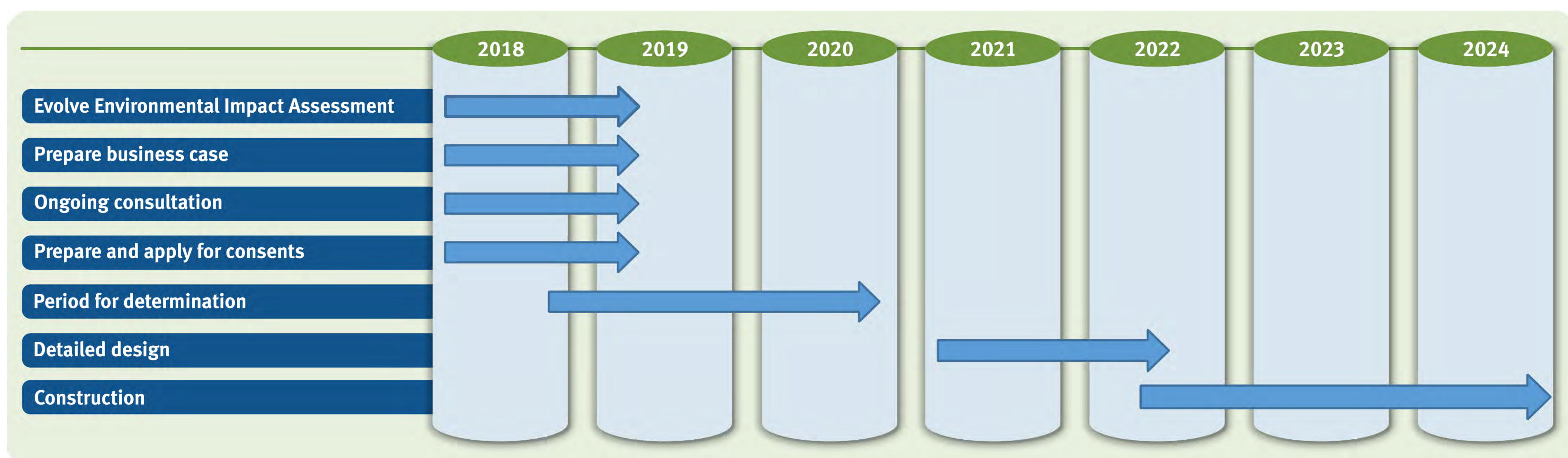
### Construction

Building the barrier and the downstream flood defences will require a significant amount of construction work. We will be working up detailed plans to help minimise disruption. These would, for example, look at how we can phase the works relative to other local projects, most efficiently organise deliveries to site and how we can be most considerate to local communities.

Subject to securing all the required consents, we aim to start work in 2022 and for construction to continue until 2025. We aim for the barrier to be operational in 2024. However, if funding and approvals are available, we may look to start some of the downstream defence works sooner.

### To find out more

- Check our web page for project updates [www.sedgemoor.gov.uk/bridgwaterbarrier](http://www.sedgemoor.gov.uk/bridgwaterbarrier)
- Email [Bridgwater.Barrier@environment-agency.gov.uk](mailto:Bridgwater.Barrier@environment-agency.gov.uk) to sign up to our newsletter.



### To comment

We would welcome your feedback in writing please. You can collect a feedback form from our exhibition or download one from our webpage. Please ensure all feedback reaches us by 1 February 2019.