Protecting, Preserving and Promoting the River Itchen in Southampton Scrutiny Inquiry

Flood Risk and the River Itchen Flood Alleviation Scheme

19 January 2023

A city of opportunity where everyone thrives

SOUTHAMPTON CITY COUNCIL

Panel Representatives

River Itchen Flood Alleviation Scheme

Southampton City Council:

- Sam Foulds - Flood Risk Management Team Leader
- Cara Brims - Flood Risk Officer

Environment Agency:

- Blake Jones – Project Executive, River Itchen Flood Alleviation Scheme
- Dave Martin – Flood and Coastal Risk Management Partnership & Strategic Overview Team Leader, New Forest, Test & Itchen

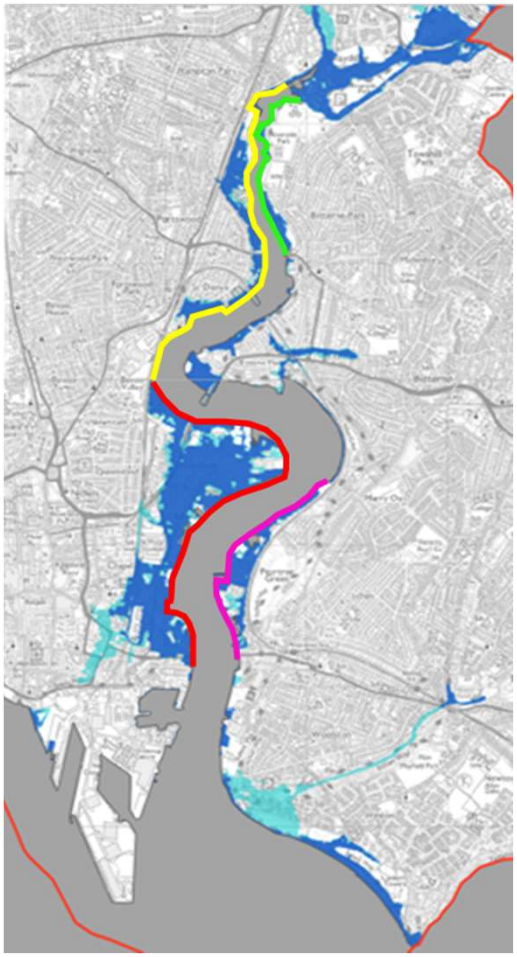
Agenda

River Itchen Flood Alleviation Scheme

ID	Item	Who
1	**Flood Risk & Mitigation** River Itchen flood risk and an overview of approaches to mitigate risk (to provide context to the RIFAS)	Sam Foulds
2	**Project Overview** The RIFAS – Scheme, costs, partners, timescales, consultation, link to wider strategies/plans	Cara Brims
3	**Environmental Considerations** Understanding how the project is considering - sustainability / water quality / environmental impact / wildlife and habitats	Dave Martin / Blake Jones
4	**Wider Opportunities** Opportunities through RIFAS – Levelling up fund, access to the waterfront, regeneration and economic development	Cara Brims
5	**Sustainable Drainage (SuDs) Approving Body (SAB)**	Sam Foulds

The River Itchen Flood Risk: Overview and Flood Risk Approaches

Tidal Flood Risk: Present Day



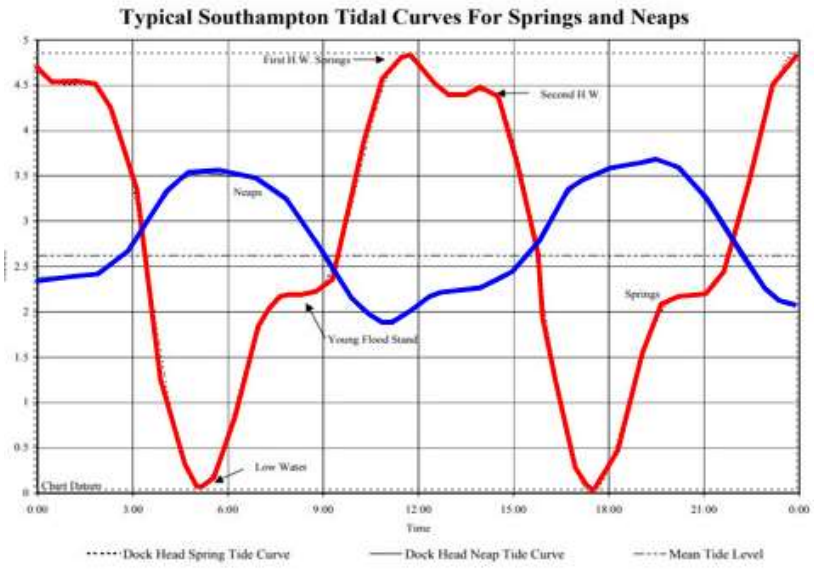
- Key flood risk is **tidal**. Fluvial flooding occurs upstream of Woodmill Bridge.
- The Environment Agency are responsible for management of flood risk from Main Rivers and the sea
- Map shows areas vulnerable to a flood with a greater than 0.5% chance of flooding **in any given year**.
- **Flood alerts and warnings** are issued by the Environment Agency.
- Greater risk to River Itchen west bank as land levels are lower.
- Four distinct areas:
  - Woodmill to St Denys (west bank)
  - Northam to Crosshouse (west bank)
  - Riverside Park (east bank)
  - Spitfire Quay (east bank)
- During a 0.5% AEP flood – **depths of 30-60cm are possible** (depending on land level).

Key:

- Present Day Flood Zone 3
- Present Day Flood Zone 2

- You can check your risk of flooding online - https://www.gov.uk/check-long-term-flood-risk

What is Tidal Flooding?



- Tide pattern alternates between **springs** (red) and **neaps** (blue).
- Tide **patterns are very predictable** and largely follow the moon cycle.
- Changes are **driven by the atmosphere (**can flood on a dry day):
  - Low atmospheric pressure – increases tide levels.
  - High atmospheric pressure – reduces tide levels.
  - High spring tides increase flood potential as tide levels are higher.
- Southampton has a **unique tidal pattern** with a double high water – this extends the period where high water may occur with a surge.
- Rainfall and high tide can cause **'tide locking'** of surface water sewers.

Tidal Flooding: Historic Floods

Woodmill 2013

St Denys 2014

Riverside Park 2015

Mount Pleasant Industrial Estate February 2020

Shamrock Quay February 2014

Crosshouse Hard February 2021

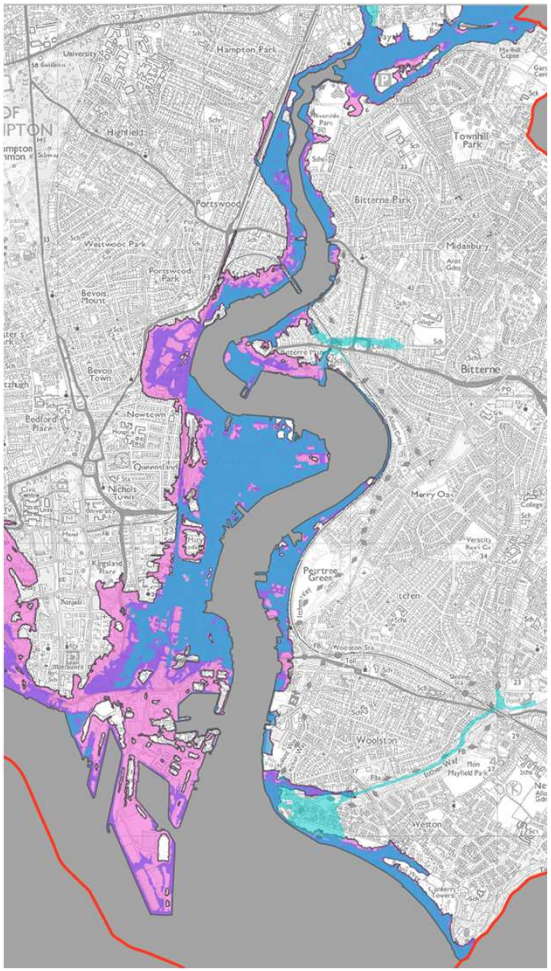
Existing Flood Defences






- There are currently **no formal raised flood defences** in Southampton.
- There is currently a mix of engineered high ground, quay walls, low flood walls and embankments of **varying condition and standard of protection** (level of protection provided).
- Where standard of protection is lower than a potential flood level, **water is likely to overtop**, resulting in flooding to the ground behind.
- Majority of Itchen frontage **is privately owned** – landowners are responsible for maintenance of assets.

Tidal Flood Risk: Climate Change and Sea Level Rise



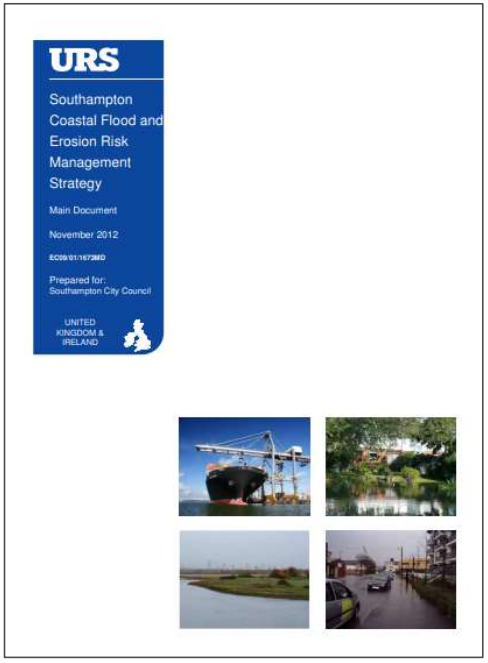
- Vulnerability to tidal flood risk **will increase over time** – more land areas, property and critical infrastructure will become at risk or experience more regular flooding.
- Greatest increase will be seen in **Northam and the City Centre** – large areas are flat, low lying and reclaimed land.
- Increased risk includes flood **extent (areas impacted) and depths** of flooding.
- By 2120, flood depths during a 0.5% AEP flood could reach up to 1.8m in some areas.

Key:

- Present Day Flood Zone 2&3
- Tidal flood risk by 2085
- Tidal flood risk by 2122

- Areas outside of the risk will also experience knock on impacts of flooding **e.g. loss of services or impact to transport.**

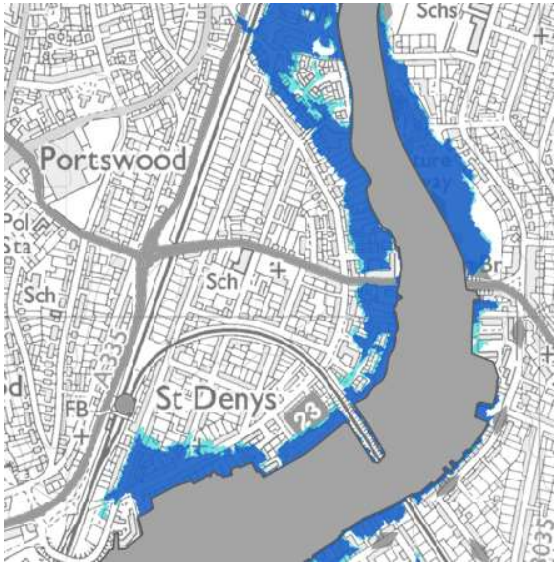
Managing Tidal Flood Risk



[See website: Southampton Coastal Flood and Erosion Risk Management Strategy]

- **Southampton Coastal Flood and Erosion Risk Management Strategy** (2012) – presents options for management of tidal risk on the west bank of the Itchen Estuary.
- The Strategy will be delivered in stages over time to **create a continuous raised** flood defence from Woodmill to Redbridge.
- Focus is on **areas where risk and need for defences is greatest**:
  - Phase 1 – River Itchen Flood Alleviation Scheme (RIFAS).
  - Phase 2 – Likely to be Woodmill to St Denys.
- Planning to revisit the Coastal Strategy to include **examination of flood risk on the east bank.**

St Denys: Property Flood Resilience



- A community with **areas of high risk** but does not attract funds for a **Strategic Flood Defence**.
- SCC delivered St Denys Property Flood Resilience – protects property from flooding internally, allowing external areas to flood.
- **Phase 1** - funded by Defra Community Pathfinder (2013-2016) – **21** properties better protected.
- **Phase 2** – funded by Environment Agency Local Levy (2016-2018) – **29** properties better protected.
- Worked directly with the community to raise awareness and set up a **Flood Action Group**.

New Development: Creating Resilient Communities

- All new development (including change of use) in a present day or future flood risk area must be accompanied by a **Site-Specific Flood Risk Assessment.**
- Development must be designed to be **safe from flooding over the lifetime.**
- Planning and development applications **are reviewed** by SCC Flood Risk Management and the Environment Agency.
- If **not demonstrated to be safe, recommendations for refusal** are presented to the Local Planning Authority.
- Waterside developments in the city centre must include Strategic Flood defences – **reducing the impact of public spend on defences**.

Funding Flood Defences

- Government **funds are limited and cannot fund all schemes** or provide schemes that manage all flooding.
- **Key sources:**
  - Government Flood Defence Grant in Aid
  - Environment Agency Local Levy
  - Community Infrastructure Levy
  - Section 106 agreements (developer contributions)
- All defence schemes must present a case to the Government to **demonstrate that the benefits** (flood damage prevented) **outweigh the costs of the scheme.**
- Schemes are also **prioritised on the benefit to the nation**, rather than local need.
- Funding for residential properties is prioritised over non-residential.
- There is currently **no legislative right** for publicly funded flood defences – property/land owners are responsible for defending their own property/land.

The River Itchen Flood Alleviation Scheme (RIFAS): Project Overview

Background

River Itchen Flood Alleviation Scheme

- **What:** The River Itchen Flood Alleviation Scheme (RIFAS) is a f**lood defence scheme on the west bank of the Itchen Estuary** between Mount Pleasant Industrial Estate to, just south of the Itchen Bridge.
- **Who:** A **partnership project** between SCC (investment and communications) and the Environment Agency (design and construction) with delivery partners JBA Consulting (design), VolkerStevin (construction), Dalcour Maclaren (land agent) and Mott MacDonald (investment team).

Environment Agency · JBA consulting · DM DALCOUR MACLAREN · M MOTT MACDONALD M · VolkerStevin · SOUTHAMPTON CITY COUNCIL

- First scheme with the Environment Agency working in partnership with a Council to deliver a project with a joint Project Team and shared resources.

- **Our Vision:** Adapting to climate change by **improving flood infrastructure** for communities on the Itchen West Bank, **to build resilience to present and future tidal flooding** to support Southampton's City Vision and Green City Plan.

Link to Wider Strategies and Plans

River Itchen Flood Alleviation Scheme

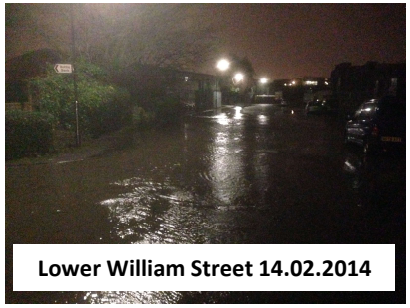
- **Southampton Coastal Flood and Erosion Risk Management Strategy (2012)** – the strategy identified the scheme area as at the most vulnerable area to tidal flooding and first area in need of intervention.
- **Local Flood Risk Management Strategy (2014)** – identified the RIFAS as a priority scheme to manage tidal flood risk.
- **North Solent Shoreline Management Plan (2010)** – 'Hold the Line' policy (defences are maintained and upgraded or replaced in their current position where funding permits).
- **National Flood and Coastal Erosion Risk Management Strategy (2021)** – the RIFAS will increase the resilience of residential and commercial properties and critical infrastructure by 2030.
- **SCC City Vision (emerging 2022)** – specifies the need for flood risk defences to support future city growth.
- **SCC Green City Plan 2030** – vision for Net Zero by 2030 and improving the natural environment.
- **Southampton Economic and Green Growth Plan (2020)** – the RIFAS has demonstrated a 40% reduction in carbon frontline compared to the baseline, contributing to SCC's aspirations towards net zero.
- **The 25 Year Environment Plan (2018)** – Reducing the risks of harm from environmental hazards.

Need for the scheme

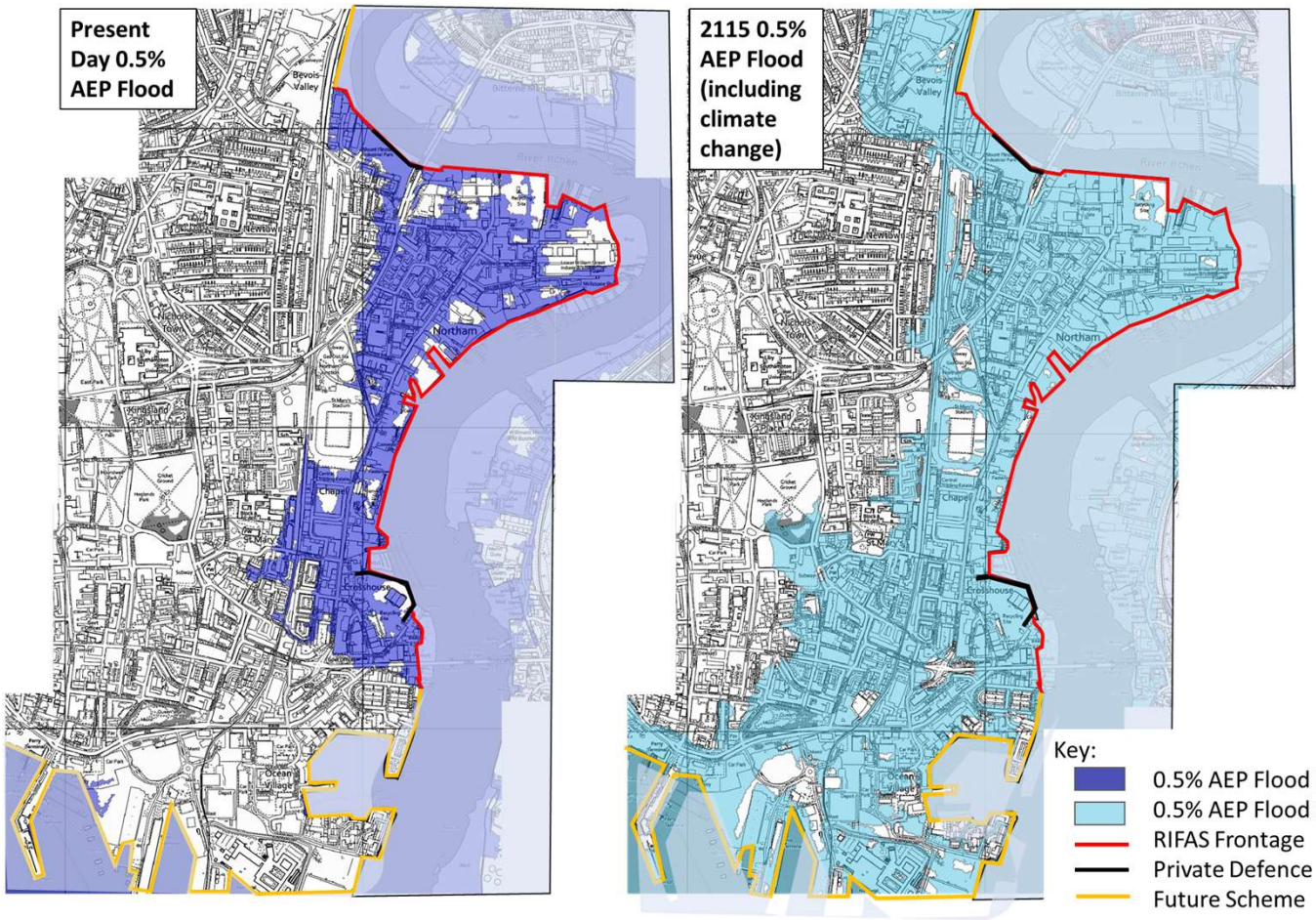
River Itchen Flood Alleviation Scheme

Town Depot 11.03.2008

Chapel Road 17.10.2012



Lower William Street 14.02.2014

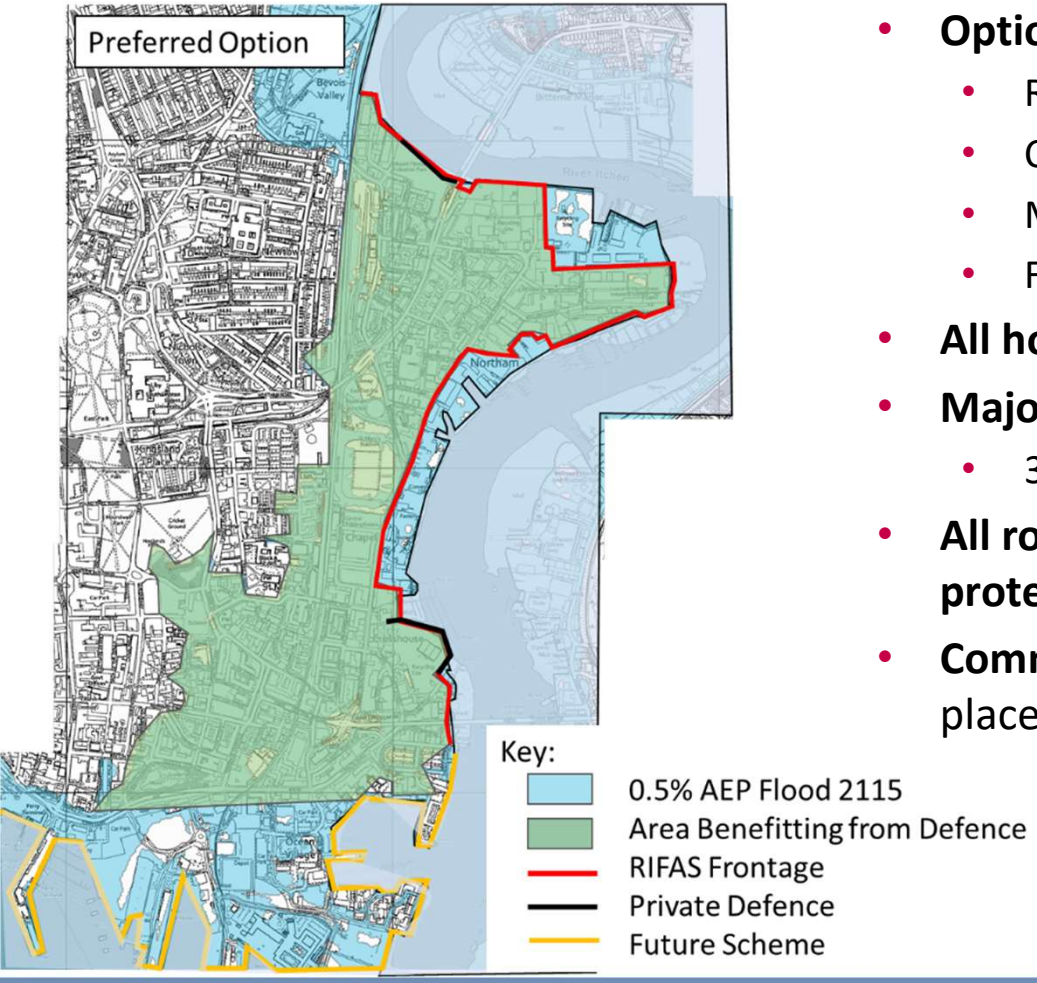


Risk 2020:
> 153 homes
> 288 businesses
> A3024 (Northam)
> Railway
> Electrical sub-stations
> Sewer pumping stations

Risk 2120:
> 1167 homes
> 1033 businesses

Alignment

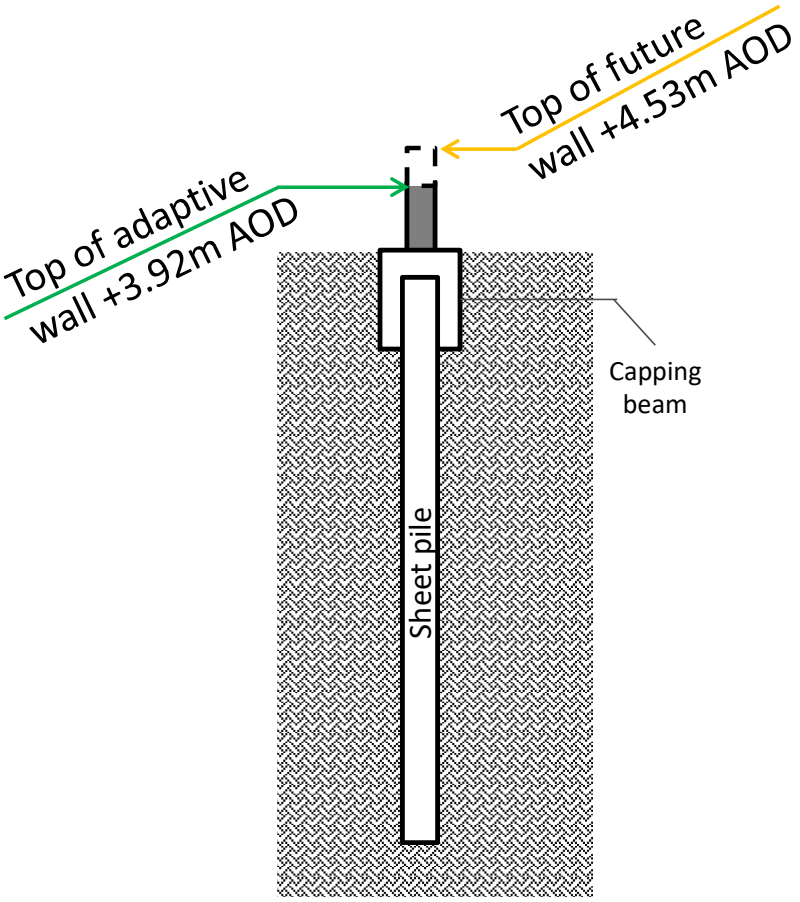
River Itchen Flood Alleviation Scheme



- **Option that best meets the project objectives:**
  - Reducing flood risk to people, property and infrastructure.
  - Cost effective and deliverable.
  - Maintain and enhance natural, historic and build environments.
  - Facilitates sustainable growth.
- **All homes will be better protected.**
- **Majority of businesses will be better protected.**
  - 30 businesses will remain at the same risk of flooding.
- **All roads, areas of railway and critical infrastructure better protected.**
- **Community infrastructure** will benefit, including religious meeting places and leisure sites.

Adaptive design

River Itchen Flood Alleviation Scheme



- Scheme delivery in **two stages**:
  - **Phase one (present day)** – Construct an interim height wall to provide a 0.5% AEP standard of protection by 2070.
  - **Phase two (future, before 2070)** – increase the height of the wall to provide a 0.5% AEP standard of protection by 2120.
- Enables flexibility in the implementation of future interventions:
  - Improved understanding and certainty regarding sea level rise (which will inform the height and date of when phase two is needed).
  - Allows development to come forward, some of which could eliminate the need for phase two intervention.
- Less impact to business operations present day (lower wall height).

Costs

River Itchen Flood Alleviation Scheme

- **Scheme cost (January 2022):** £85.6m.
- **Confirmed funding (£45.5m):**
  - FCERM Grant in Aid: £34.8M.

    Environment Agency approvals from the Large Project Review Group (August 2022):
    - Progress the preferred option (adaptive design) to detailed design.
    - Release of ~£7m to progress the scheme to Full Business Case.

  - Community Infrastructure Levy (CIL): £10.2M.

    Southampton City Council approvals at Full Council (November 2021):
    - £3m CIL for the delivery of the scheme.
    - £7.2m CIL to deliver a frontline option at Drivers Wharf.

  - Southern Regional Flood and Coastal Committee: £0.5M.

Consultations

River Itchen Flood Alleviation Scheme

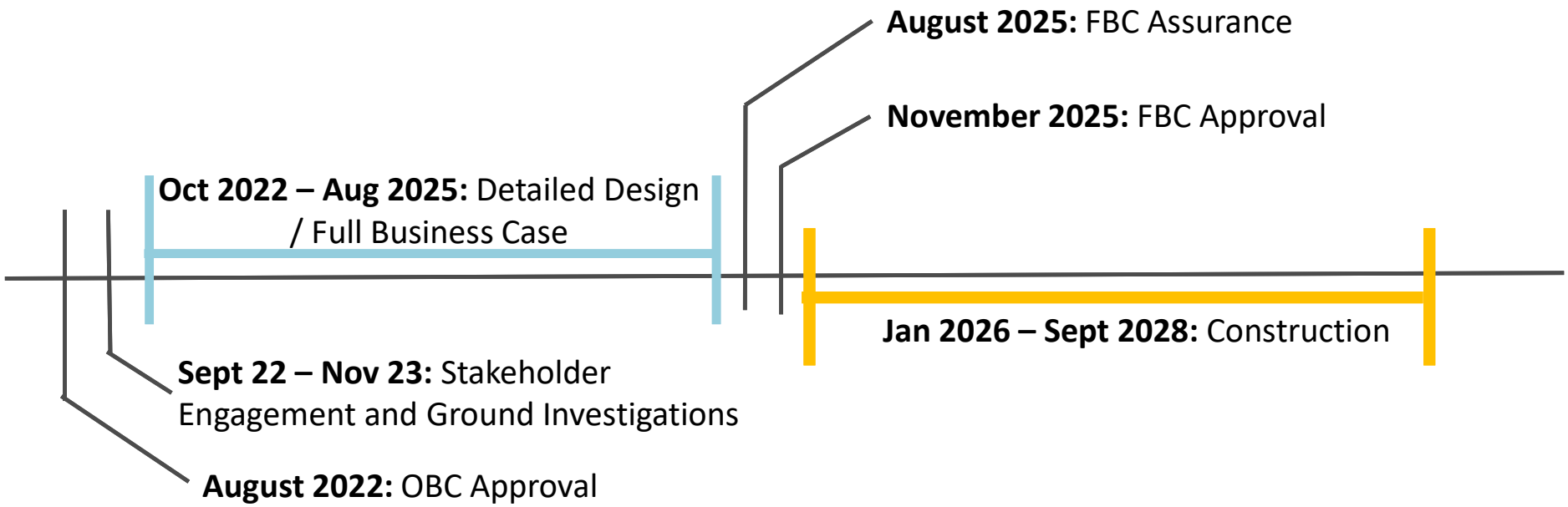
- **Engagement** has been ongoing with landowners and businesses that will be directly affected by the scheme, through options appraisal, identification of the preferred option and for ground surveys for 2+ years.
  - Engagement will continue to produce the detailed design over the next 3 years.

- **Public consultation**
  - Website (www.southampton.gov.uk/rifas).
  - Social media and newsletters.
  - Drop-in sessions to be planned now the project has received business case approval.

- **Planning Permission**
  - The scheme will require planning permission; anyone will have the ability to comment on the application through SCC Planning.

Timescales

River Itchen Flood Alleviation Scheme



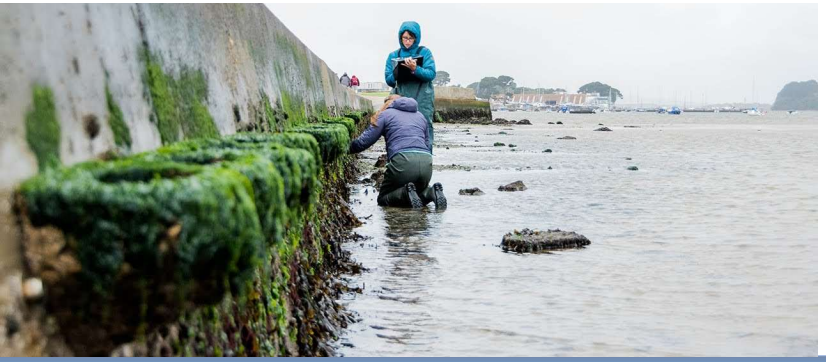
- Note: FBC timescales under review during current contract negotiations for FBC delivery.

River Itchen Flood Alleviation Scheme (RIFAS): Environmental Impacts and Enhancements

River Itchen Flood Alleviation Scheme

Environmental Enhancements

Biodiversity Net Gain (BNG) – 20% net gain target



Environmental Considerations

River Itchen Flood Alleviation Scheme

- EA and SCC aiming for **net zero by 2030**.

- EA sustainability plan: **eMission 2030**:
  - Responding to the climate emergency.
  - Optimising use of resources.
  - Benefiting people and communities.
  - Deliver environmental net gain.

- Fundamental to project objectives:
  - Reduce flood risk to people, property and infrastructure over the duration of the project design life, whilst ***accounting for climate change and adapting*** to the potential impacts.
  - Provide cost effective and deliverable flood risk management intervention, which is technically feasible and ***sustainable***.
  - Maintain and where possible ***enhance the natural, historic and built environments***.
  - ***Facilitate sustainable growth*** along the west bank of the River Itchen (which includes parts of the City Centre) for businesses and residential purposes, including access.

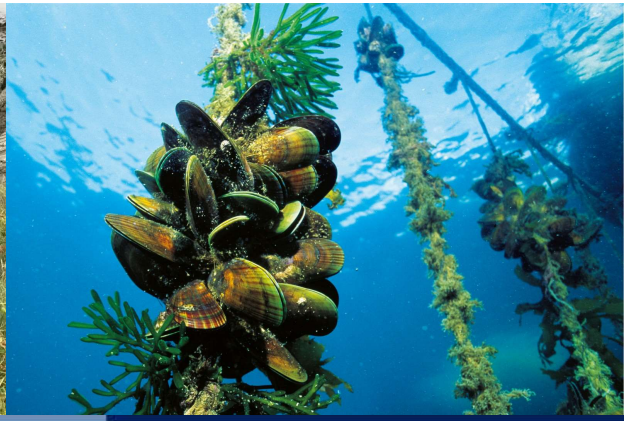
Environmental Considerations

River Itchen Flood Alleviation Scheme

Sustainability

- Sustainability Strategy completed:
  - UN sustainable development goals.
  - Building Research Establishment Environmental Assessment Method (BREEAM).
  - Biodiversity net gain.

- Environmental opportunities register created:
  - 48 opportunities identified for consideration.
  - Carbon and pollution reduction e.g. bivalves.
  - Heritage, public realm and ecological improvements e.g. habitat creation.



Environmental Considerations

River Itchen Flood Alleviation Scheme

Sustainability

benefits

- 1st — THE WORLD'S 1ST INFRASTRUCTURE SUSTAINABILITY ASSESSMENT METHOD
- HOLISTIC SUSTAINABILITY MEASUREMENT AND BENCHMARKING
- INDEPENDENT VERIFICATION AND CERTIFICATION
- £ — CAN DELIVER ECONOMIC SAVINGS 5-10%+
- ADAPTABLE TO LOCAL AND CLIMATIC CONDITIONS
- ENHANCED TEAM COLLABORATION
- IMPROVED REPUTATION AND COMPETITIVENESS
- BRE SCIENTIFICALLY BACKED STANDARDS
- DRIVING INNOVATION

Assessment

Scheme rating:

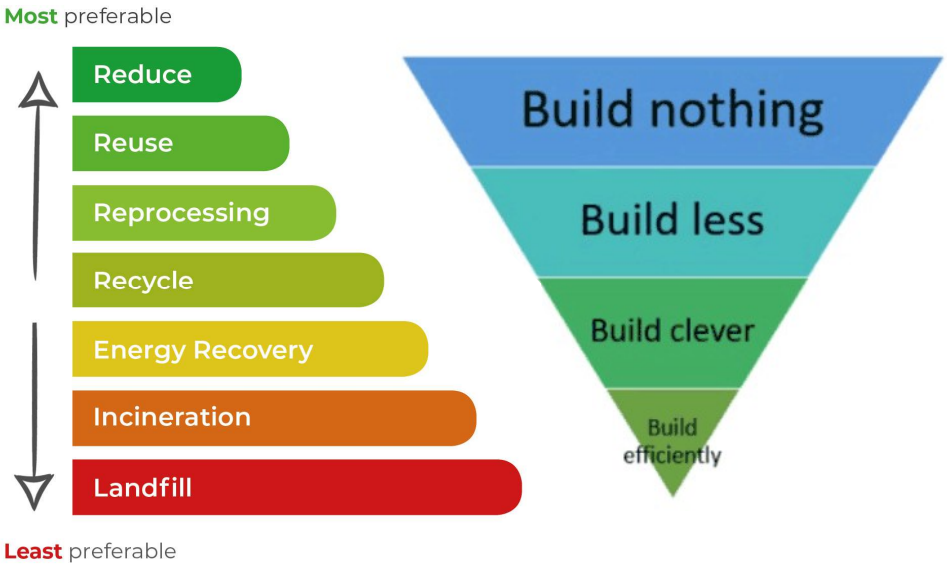
Rating	Assessment Score (%)
Outstanding	≥90
Excellent	≥75
Very Good	≥60
Good	≥45
Pass	≥30

Environmental Considerations

River Itchen Flood Alleviation Scheme

Sustainability

- BREEAM infrastructure assessment:
  - Resource Strategy Plan.
  - Responsible use of materials, energy and water.
  - Reducing whole life impacts from resource use.
  - Resource use within a circular economy.
  - Reducing waste in accordance with waste hierarchy.
- Whole life carbonomics assessment undertaken:
  - Carbon costs and benefits calculated for each option.
  - Most carbon efficient option selected.
  - Adaptive approach taken (build less now).
  - Fewer flood gates to reduce O&M carbon.
  - Circa 60% carbon reduction delivered against baseline.

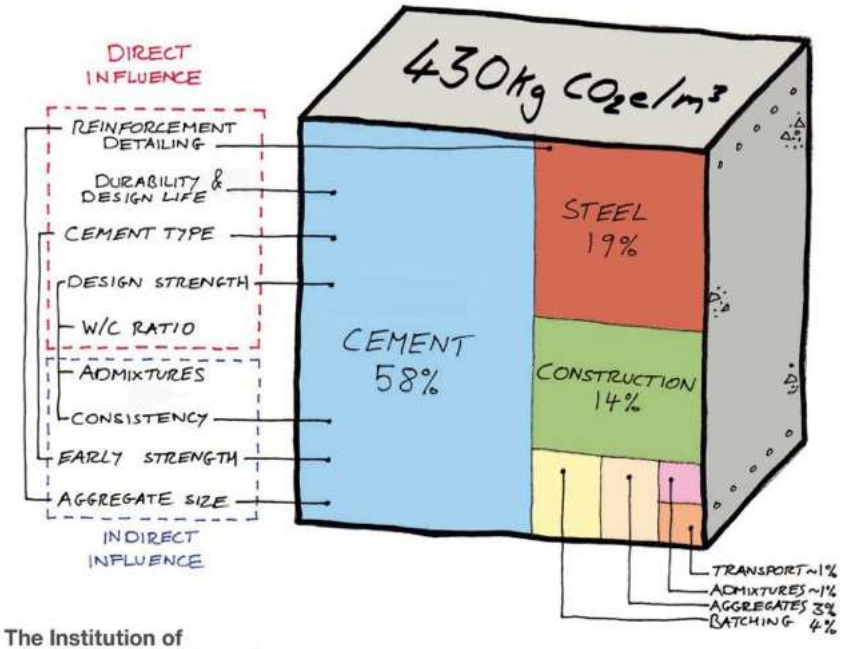


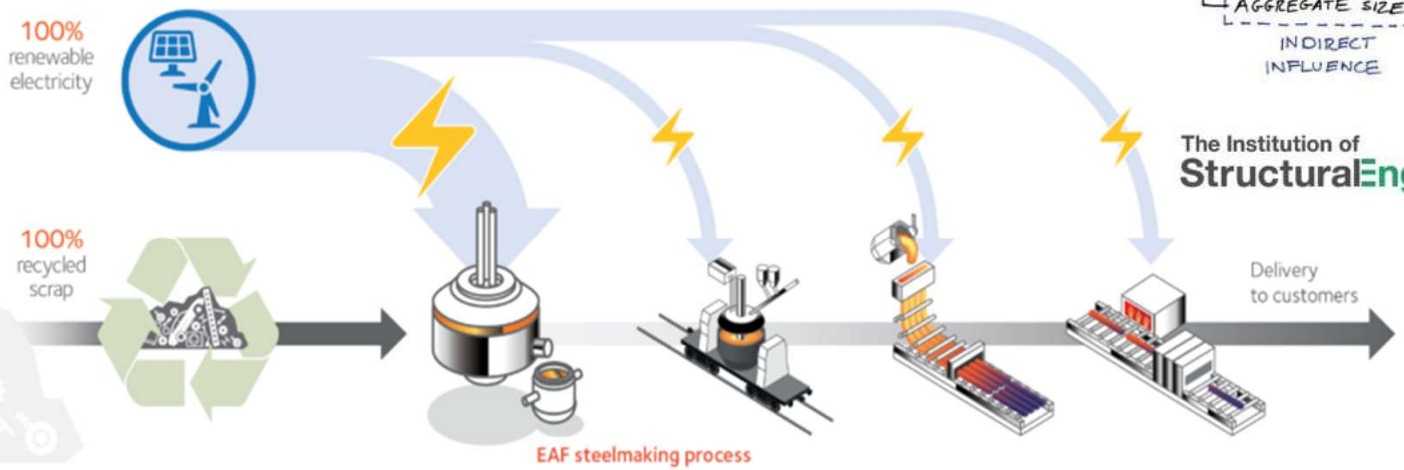
Environmental Considerations

River Itchen Flood Alleviation Scheme

Sustainability

- Innovation opportunities being considered:
  - Alternative materials e.g. basalt and cem-free concrete.
  - Alternative seepage cut-off options e.g. soil mixing.
  - Using recycled steel.
  - Test-based design.
  - Blue carbon solutions e.g. bivalves.





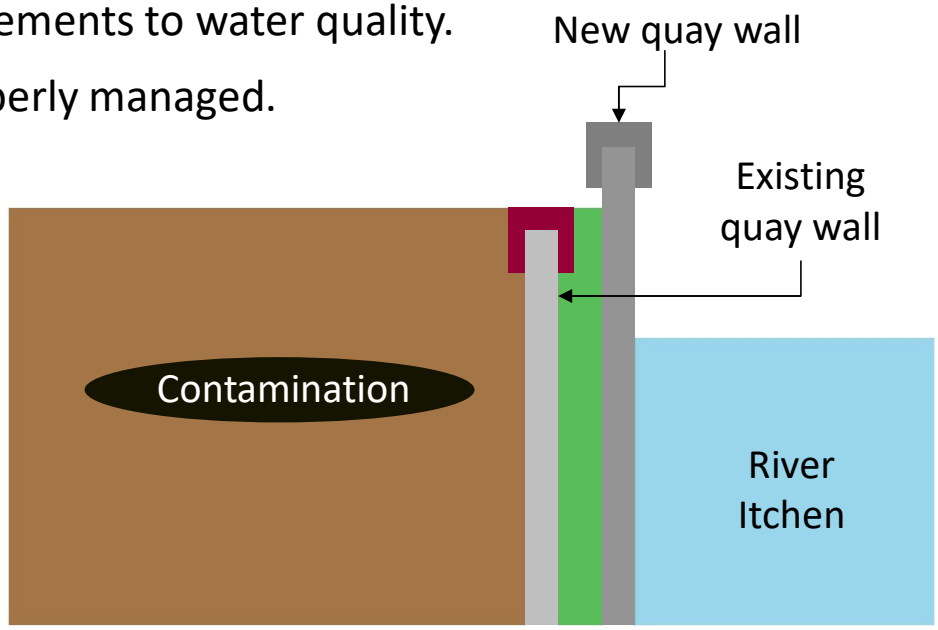
The Institution of StructuralEngineers

Environmental Considerations

River Itchen Flood Alleviation Scheme

Water Quality

- Limited opportunity to influence water quality through:
  - **Future impacts** – reduce risk of some future impacts on water quality.
  - **Environmental enhancements** – possible for minor improvements to water quality.
  - **Construction** – potential to impact water quality if not properly managed.
  - **Scheme benefits:**
    - Mix of frontline and setback defences.
    - Reducing flood risk, reduces risk of pollution from receding flood water.
    - Prevention of new pollution pathways caused by quay failure e.g. Drivers Wharf.
    - Tide flaps onto all outfalls.



Environmental Considerations

River Itchen Flood Alleviation Scheme

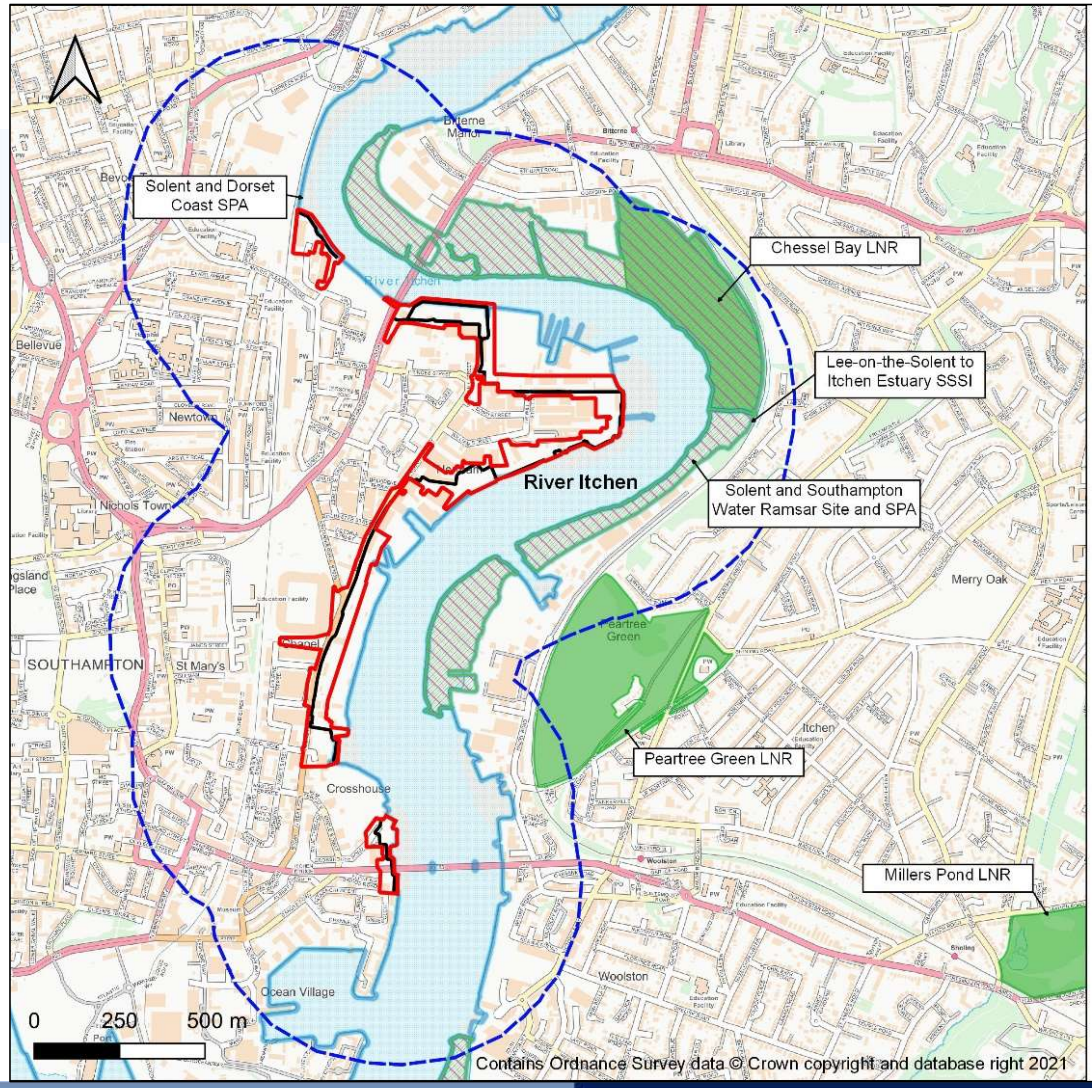
Water Quality

- Environmental Enhancements:
  - Opportunities being reviewed / developed.
  - Some deliver multiple benefits:
    - Bivalves.
    - Sustainable urban drainage to reduce nutrient levels.
- Construction Impacts:
  - Water Framework Directive assessment completed.
  - Potential impacts identified.
  - Impacts can be mitigated:
    - Pollution prevention measures.
    - Providing habitat enhancement.
  - Detailed assessment to be undertaken during detailed design.

Environmental Considerations

Environmental Impact

- Multiple protected sites:
  - Special Protection Area.
  - Ramsar site.
  - Special Area of Conservation.
  - Site of Special Scientific Interest.
  - Local Nature Reserves.
- Environmental impact assessment:
  - Statutory EIA not required.
  - Non-statutory environmental appraisal being undertaken as best practice.
  - Preliminary Environmental Impact Report produced.
  - Environmental Report to be produced for detailed design.

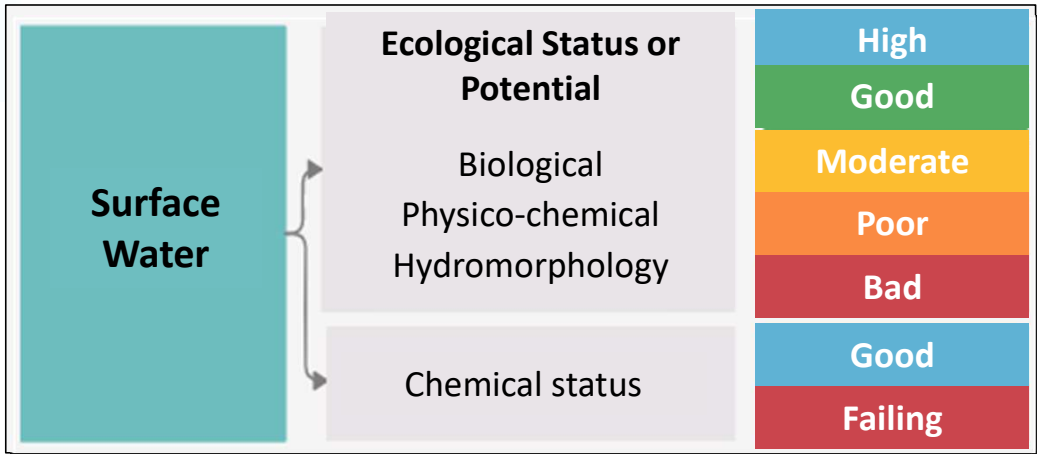


Environmental Considerations

River Itchen Flood Alleviation Scheme

Environmental Impact

- Consents and licences being applied for:
  - Marine Licence (Marine Management Organisation).
  - Flood Risk Activity Permit (Environment Agency).
- Environmental assessments undertaken:
  - Habitats Regulations Assessment.
  - Water Framework Directive Assessment.
  - Environmental Risk Assessment.
  - Environmental Action Plan.
- Consultation with:
  - SCC internal consultees.
  - EA internal consultees.
  - Natural England.
  - Historic England.



Environmental Considerations

River Itchen Flood Alleviation Scheme

Environmental Impact

Potential impacts

- Noise and vibration
- Dust
- Loss of habitat due to encroachment
- Reduced access/connectivity e.g. road closures
- Disruption (business and leisure)
- Changes in visual amenity
- Disturbance of archaeological deposits
- Changes to heritage setting
- Pollution caused by release of ground contamination

Planned mitigation

- Environmental appraisal
- Environmental action plan
- Stakeholder consultation
- Surveys, monitoring and modelling
- Coordinated planning e.g. to avoid nesting, migration, busy times
- Alternative methodologies e.g. press piling
- Mitigation for unavoidable impacts
- Compensation for losses
- Biodiversity net gain (20% target)
- Environmental enhancements e.g. public realm
- Adaptive approach to reduce visual impact

Environmental Considerations

River Itchen Flood Alleviation Scheme

Environmental Impact

Potential impacts	Planned mitigation
• Noise and vibration affect sensitive receptors	• Noise surveys, monitoring, modelling and assessment • Avoid nesting and migration seasons where practicable • Alternative construction methodologies e.g. press piling
• Disturbance of archaeological deposits • Change to setting of heritage assets	• Continued consultation with HE through detailed design to – Minimise potential impacts – Identify appropriate mitigation – Identify opportunities to improve heritage value e.g. Chapel Mills • Written Scheme of Investigation for site works • Opportunities for outreach/engagement with community
• Disruption to users of surrounding areas • Reduced access during construction • Changes in visual amenity	• Opportunities to provide significant landscape improvements • Feasible enhancement options being developed • Coordinated construction planning e.g. avoid busy times

Environmental Considerations

River Itchen Flood Alleviation Scheme

Wildlife and Habitats

- Opportunities register:
  - Refuge provisions for salmon.
  - Bat boxes.
  - Bird roost pontoon at Shamrock Quay.
  - Oyster cages.
- Consultation with SCC and EA internal teams, NE and HE.
- Landscape and habitat improvements e.g. Mount Pleasant Industrial Estate and Crosshouse car park.
- Public realm improvements e.g. footpath along Mount Pleasant Industrial Estate.
- Biodiversity net gain target 20%.
- Multiple benefits e.g. improving water quality improves habitats and vice versa.

River Itchen Flood Alleviation Scheme (RIFAS): Economic Opportunities for Southampton

Waterside Access and Public Realm

River Itchen Flood Alleviation Scheme

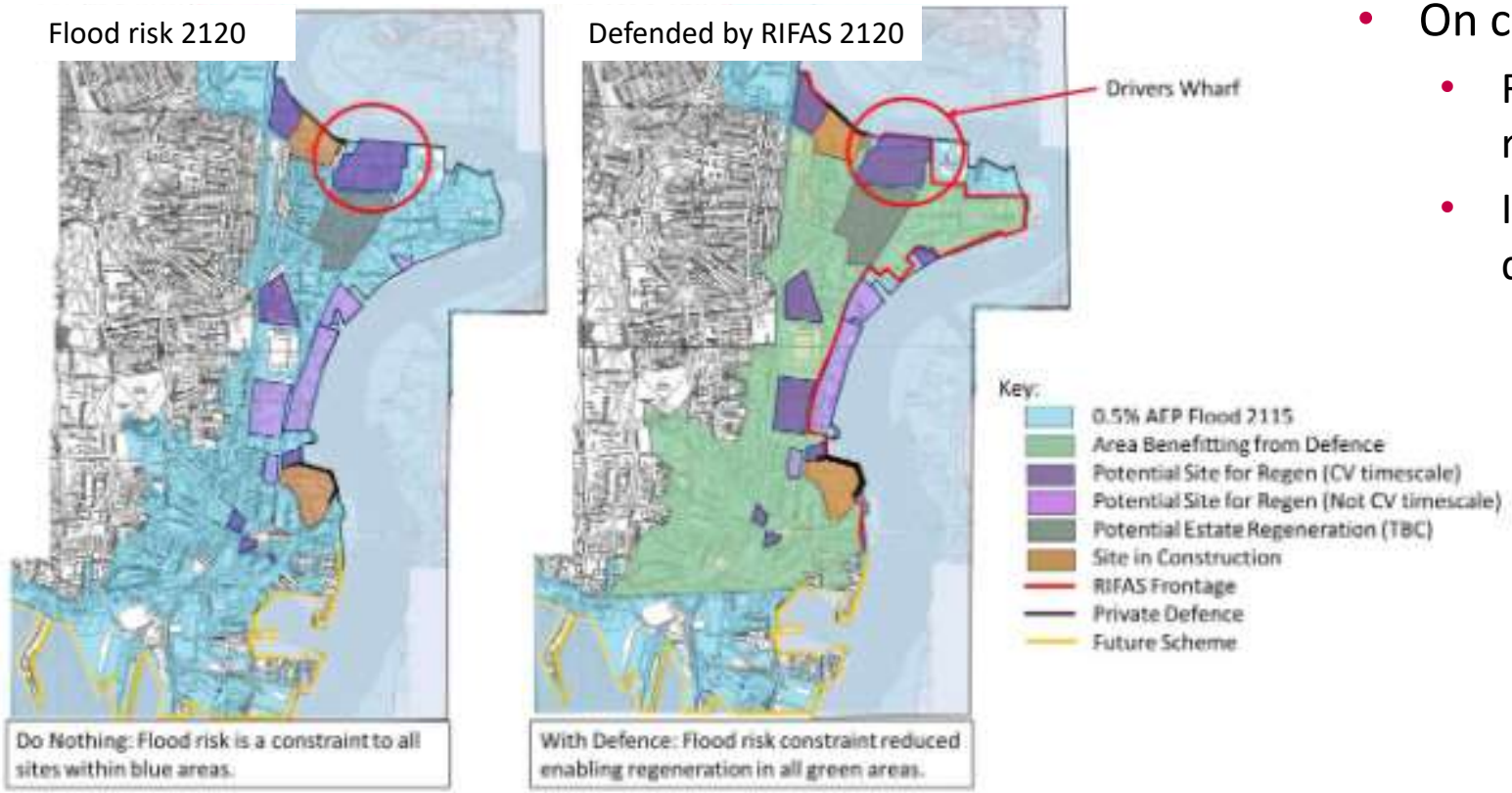
- The RIFAS will seek to improve the public access and public realm along the waterfront:
  - Optioneering assessment to consider and determine viable and affordable options.

^ Mount Pleasant Industrial Estate

Crosshouse Car Park (Itchen Bridge) >

Wider Regeneration

River Itchen Flood Alleviation Scheme



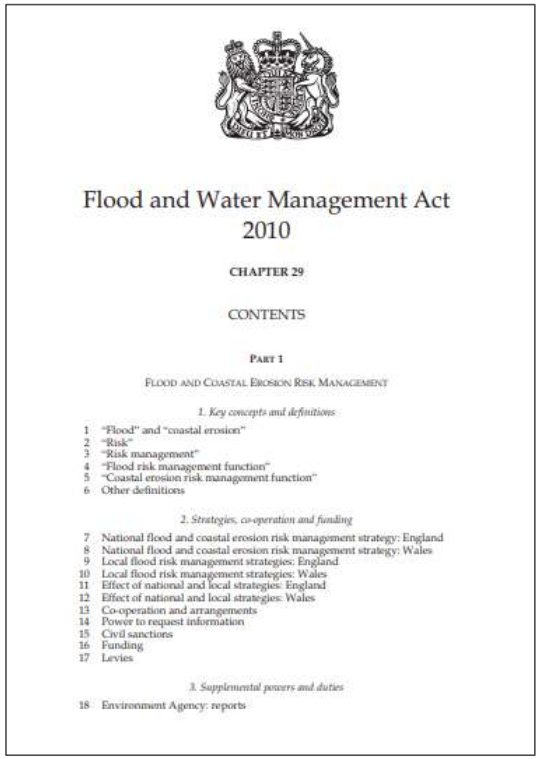
- On completion, the RIFAS will:
  - Remove the constraint of flood risk to many areas.
  - Increase regeneration and development opportunities.

Levelling Up Fund

- Bid for ~£15.8m submitted in August 2022 (outcome expected February 2023)
- Key aims:
  - Unlock funding to replace failing quay wall with flood defence at Drivers Wharf.
  - Enable demolition of Ocean House.
  - Replacement Boardwalk structure.
- Outcomes:
  - Reduced flood risk.
  - Improved regeneration potential in line with:
    - the emerging City Vision.
    - existing businesses.
  - Improved active travel and public realm.

Sustainable Drainage (SuDS) Approval Body

Flood and Water Management Act 2010: Schedule 3



Flood and Water Management Act 2010

CHAPTER 29

CONTENTS

PART 1

FLOOD AND COASTAL EROSION RISK MANAGEMENT

1. Key concepts and definitions

1 "Flood" and "coastal erosion"
2 "Risk"
3 "Risk management"
4 "Flood risk management function"
5 "Coastal erosion risk management function"
6 Other definitions

2. Strategies, co-operation and funding

7 National flood and coastal erosion risk management strategy: England
8 National flood and coastal erosion risk management strategy: Wales
9 Local flood risk management strategies: England
10 Local flood risk management strategies: Wales
11 Effect of national and local strategies: England
12 Effect of national and local strategies: Wales
13 Co-operation and arrangements
14 Power to request information
15 Civil sanctions
16 Funding
17 Levies

3. Supplemental powers and duties

18 Environment Agency: reports

- On 10 January 2023 the Government announced that it is **committed to the enactment** of Schedule 3 of the Flood and Water Management Act 2010 **by the end of 2024.**
- This will amend the Water Industry Act 1991 to **end the automatic right to drain surface water to a public sewer**.
- It will become a requirement **all new developments** of more than 1 dwelling house or where the construction area is 100 square meters or more, **will require sustainable drainage systems** (SuDS) for managing surface water.
- The primary benefits will include:
  - Reducing surface water entering sewers – less combined sewer overflows
  - Reusing water as a resource.
  - Improving habitat, biodiversity and water quality.
  - Improving amenity.

The SuDS Approval Body (SAB)

- The Government is currently reviewing how the SAB will work in England.
- Once enacted, Schedule 3 will make unitary authorities a **SuDS Approval Body (SAB)**.
- The SAB will sit alongside the current role as **Lead Local Flood Authority**, but introduce responsibility for:
  - **Evaluate and approve drainage applications** for new developments where construction work has drainage implications, and
  - **Adopt and maintain SuDS schemes**, subject to the conditions and exemptions specified in the 2010 Act.
- Where criteria is met, the applicant **will need to demonstrate compliance** with the Statutory SuDS Standards for the design, construction, operation and maintenance and operation of surface water systems through an application to the SAB.
- Construction work which has drainage **implications cannot be commenced** unless the drainage system for the work has **been approved by the SAB**.

Thank You.