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**Bristol City Council**

# Bristol Avon Flood Strategy

## Phase 1 cost update note

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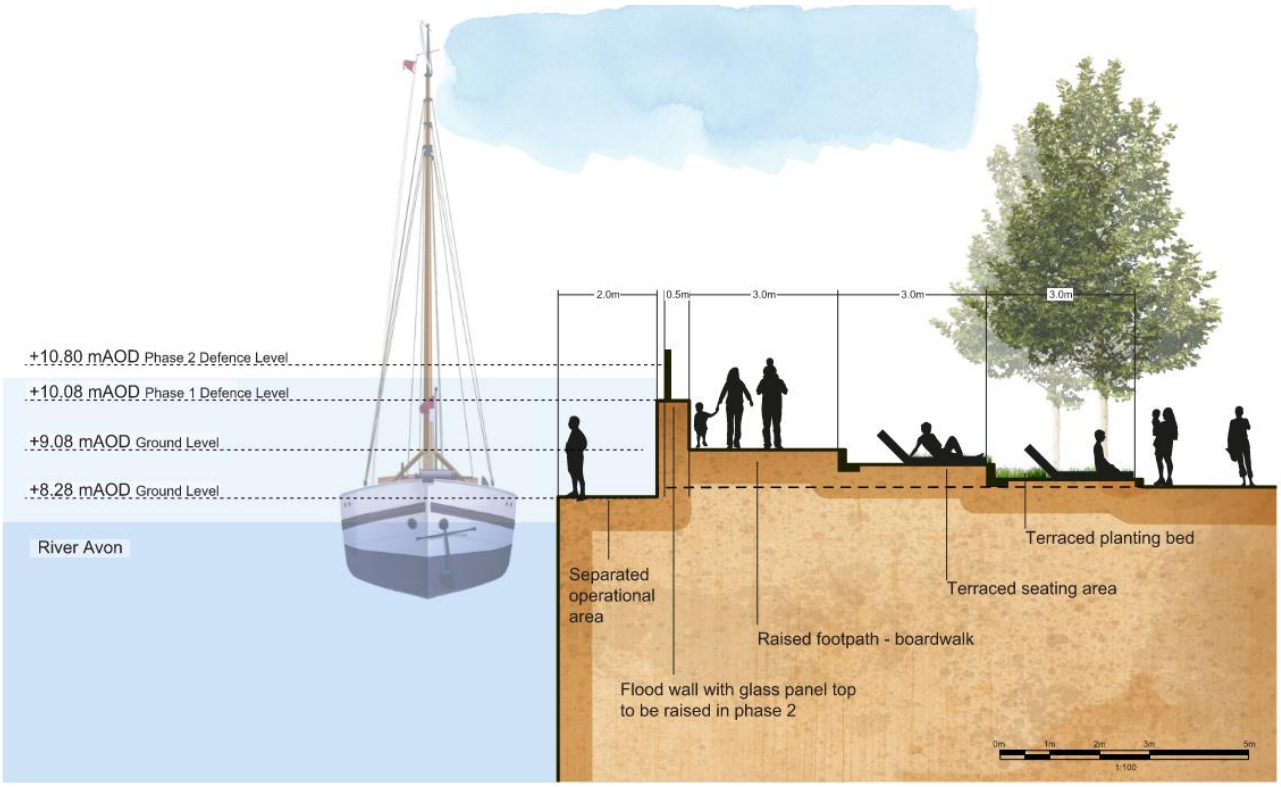


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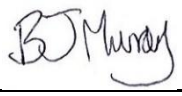
| **Signature** |  |  |  |

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|---|---|---|---|
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| **Signature** |  |  |  |

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# 1. Introduction

Bristol is at risk of widespread flooding from the River Avon from high fluvial flows and from tidal events propagating up the river from the Severn Estuary. Bristol City Council (BCC) have worked with the Environment Agency (EA) and other partners to create a long-term Strategy for managing flood risk from the River Avon. The Strategic Outline Case (SOC) was presented to the EA's Large Project Review Group (LPRG) and assured in January 2021. Following a public consultation, the Strategy was endorsed by BCC cabinet in March 2021.

As part of the current Outline Business Case (OBC) stage, an update to the existing cost estimate compiled at SOC has been carried out. This cost estimate update has been carried out by Arcadis and Arup as part of the Council's Strategic Partnering Initiative. The majority of the updates cover works to be carried out in phase 1 of the scheme (starting in the 2020s), as this is where the majority of the cost is accrued, in particular in present value terms.

This report summarises the costing exercise undertaken. Unless stated otherwise, costs in this report are stated in 2023 prices, for the 'local choice' standard of protection. Further discussion around different standards of protection are given in the main OBC. Total project costs should be taken from the OBC depending on the purpose of the cost (economic appraisal, whole life cost and / or approval costs) given the different requirements for these costs around risk, inflation, present value and future costs.

## 1.1 Existing cost estimate

The previous cost estimate was reviewed before commencing the pricing update for the OBC. The existing estimate was prepared using a MS Excel document, compiled with unit rates for key construction types (e.g., flood wall >1.2m) and multiplied by expected defence lengths (x metres) plus further lump sum allowances where appropriate for certain assets, e.g., flood gates and rail crossings. Allowances were also made as known at the time for placemaking (including landscaping) at each area of defence and cladding of flood walls with brickwork.

This produced a base cost for each of the two phases with assumed construction dates as below:

- Phase 1: 2024
- Phase 2: 2065

The base costs for both phases were then uplifted to allow for potential service diversions required, professional fees, environmental mitigation, site investigation, compensation costs and optimism bias, all at assumed percentages on top of the base costs prepared.

The total estimate value was:

Phase 1: £215,951,964

Phase 2: £34,466,300

**Phases 1 & 2 total: £250,418,265**

# 2. Estimate update (December 2023)

A review of the existing cost estimate was undertaken to understand what was needed to produce a revised, more robust cost estimate for OBC following the updated design carried out since the SOC. The updates to the design are set out in the preferred options report (285982-ARP-XX-RP-CIV-003, appendix C of the OBC). The review highlighted that some key areas for pricing would need to be reviewed and updated as follows:

- The assumed asset types at each location (e.g., flood wall > 1.2m, wall raising, embankments etc.)
- Asset lengths for each location (length of a given asset type)
- Unit rates for each asset type (the rate per metre for an asset)
- Updates to lump sum allowances for flood gates and lock gates
- Review of placemaking (including landscaping) allowances at each location
- Cladding type and rates for cladding on flood walls
- Inflation allowances revisions (to current prices and then beyond to a revised 2026 start date)
- Detriment mitigation works refined (based on more accurate design assumptions and lengths)
- Revisions to allowances for:
    - Service Diversions
    - Environmental Mitigation
    - Site Investigation
    - Staff and Consultants
    - Compensation costs
    - Optimum Bias
    - Risk allowances

Data provided in support of the estimate update comprised:

- Scheme general arrangement drawings, showing updated defence locations.
- Section drawings for key defence locations,
- An updated schedule of asset lengths
- Flood embankment volumes
- Design assumption updates for placemaking (with some outline sections)
- Cladding assumptions to walls

## 2.1 Detailed update notes

### 2.1.1 Asset locations, asset types and lengths

Using the updated general arrangement drawings and section drawings, a revised ‘reach’ title schedule was produced that aligned to the revised the numbering and titles given to defence locations in the latest drawings.

For asset types, a review of each section drawing was undertaken for each location to determine:

- Asset type
- Asset length

### 2.1.2 Unit rates

Much of the work undertaken for the pricing update overall focussed on an in-depth review and update of unit rates for specific asset types.

For each asset type, the rate build-up was reviewed and, in many cases, provided a more up to date rate from benchmark data from similar schemes undertaken, with this then revised to 2026 for inflation.

By using a more recently dated benchmark rate, this in turn reduced the risk of projecting more years of inflation than necessary. E.g., using a 2023 rate and applying inflation to 2026 as opposed to a 2019 rate and adjusting to 2026. This is particularly important given the price increases seen in 2022 and 2023 with respect to inflation, which has been greater than many recent years.

Much of the scheme is based upon a combination of a few key asset types from within the complete list to the right-hand side, with 'reinforced concrete walls, piled walls and wall raising' being the most important for accuracy, due to the number of total metres of these assets within the overall scheme.

Some rates updated were relatively straightforward, such as the reinforced concrete wall, where reliable unit cost data was available to Arcadis for this asset type, where only an inflation adjustment was needed to arrive current 2023 rates. For other rates, such as the contiguous piled walls, a more detailed rate buildup needed to be built up in order to be accurate.

| Type | Linear Rate / m |
|---|---|
| Reinforced Concrete wall (<1.2m) | £ 2,792 |
| Reinforced Concrete wall (>1.2m) | £ 6,893 |
| Sheet Piled Wall (<100m length) | £ 13,609 |
| Sheet Piled Wall (>100m length) | £ 7,354 |
| 600d 23mL Contig Piled Wall | £ 3,890 |
| 450d 18L Contig Piled Wall | £ 3,535 |
| 170mm Driven Steel Piles | £ 1,990 |
| 600d 10mL Contig Piled Wall | £ 6,339 |
| 1500d 19mL Contig Piled Wall | £ 13,245 |
| 750d 14mL Contig Piled Wall | £ 3,831 |
| Terraced Wall on minipiles | £ 6,619 |
| RC wall on minipiles | £ 6,391 |
| RC wall on angled minipiles | £ 8,728 |
| Floodwall on piles | £ 15,948 |
| Double Raked Piles | £ 3,813 |
| Wall raising | £ 2,461 |
| Wall raising: Glazed | £ 1,750 |
| Choc. Path remedials - Wall on piles | £ 45,804 |

**Table 1: Linear rates for various defence types**

### 2.1.3 Lump sum allowances

Within the previously prepared estimate at SOC there were several lump sum allowances made for certain assets where a unit rate would not have been suitable for estimating in place of a specific cost allowance. This covered mainly replacement of lock gates at Entrance Lock, works at Brunel and Bathurst Dams, and Netham Lock

Advice was sought on costing these items from the early supplier involvement contractor (BAM Nuttall). Their report and further discussion are contained within the preferred option report (Appendix C of the OBC). The updated cost of these key lump sum items can be seen below. It should be noted that, during discussion with the contractor, significant cost savings compared to the cost of the preferred option could be realised by using a different design and construction approach (noted in the contractor report) and these should be revisited at later stages.

Entrance Lock Gate Replacement: £8,316,000

Brunel Dam Encasement: £11,592,000

Bathurst Dam Encasement: £6,212,640

Netham Lock New Floodgate: £6,510,000

### 2.1.4 Placemaking allowances

At SOC stage, placemaking was costed by applying an indicative rate per linear m of defence across the scheme, set as either 'high' or 'low' depending on location. A full placemaking 'design' has not been carried out at this stage, but placemaking opportunities have been incorporated into the engineering design – for instance through terracing, inclusion of active travel opportunities and landscaping.

Indicative quantities of these elements have been costed to include in the overall cost estimate. For some areas, an indicative per m rate has been applied to the scheme, uplifted from the rate used at SOC.

Cladding allowances for each flood defence have also been updated. This was undertaken with information and assumptions provided by the placemaking team.

### 2.1.5 Inflation

The revised estimate makes some key updates with regard to inflation. The base cost in the estimate has all rates updated to 2023 using current indices. The uplift percentages used do vary depending on the age of each benchmark rate used in the estimate.

Inflation has been calculated according to the Environment Agency's guidance document *'Allowing for inflation in FCERM projects'.* Costs are inflated based on whether they are 'construction' activities (Capex and service diversions) or 'non-construction' (site investigation, staff and consultants, environmental mitigation and compensation). The split of costs for each activity per year has been estimated based on the construction programme in Appendix G of the OBC.

The inflation values used are as per Table 2, based on the relevant UK Government GDP deflator values from June 2023.

| | 2023 | 2024 | 2025 | 2026 | 2027 onwards |
|---|---|---|---|---|---|
| Non construction | 8.2% | 8.2% | 8.2% | 8.2% | 8.2% |
| Construction | 7.8% | 6.3% | 4.2% | 3.8% | 2% |

**Table 2: Inflation values used in cost buildup**

Risk and uncertainty applied after inflation, so apply at the same rates based on 'construction or 'non-construction'.

### 2.1.6 Temporary Works, Access Restrictions and Construction Phasing

As part of the early supplier involvement with the contractor BAM Nuttall, the impact of the level and scale of temporary works and access restrictions on the overall construction time and cost was discussed. The scale of the options for a typical section of the site that ran between the riverbank and an adjacent highway was from full closure (shortest construction time but severely disruptive) to nearly full access and using marine based temporary works (rafts, barges and piers) to access and construct the raised defences from (longest construction time but minimal highway access impact). The assumption for the cost update was to assume the same level of closure as the recently completed Cumberland Road repair works which has reduced a two-

lane highway down to one lane with traffic management and uses a terrestrial based site access and temporary works.

The assumed construction phasing for the works, and reflected in the cost update, between Entrance Lock and Netham Lock assumes that two independent works areas will be working concurrently towards the city centre and that they are far enough apart from each other that the required access restrictions on each area will not compound to have adverse effects on traffic movements within the city centre.

### 2.1.7 Detriment mitigation works

At SOC stage, limited design information was available for detriment mitigation works, and indicative linear rates were used. Following the additional modelling certainty and design work carried out at OBC, these defences have been priced in the same way as the defences for the rest of the scheme using costs per liner metre, multiplied by length by asset type (flood walls for example).

Property flood resilience measures have been costed at £10,000 per property, based on costs from similar schemes.

### 2.1.8 Service Diversions

The SOC included an additional 5% on top of Capex costs to allow for service diversions. Following a desktop search, an analysis was carried out to whether each asset location required a low, medium or high allowance, or whether no services were likely to be affected. The uplift percentages applied were 0%, 1%, 2.5% and 5% for none, low, medium and high risk locations respectively. These estimates are based on experience of other similar projects, but will be subject to revision at detailed design and following further utilities searches.

### 2.1.9 Environment Mitigation

Based on an analysis of the biodiversity net gain (BNG) requirements for the scheme and comparable rates of providing suitable mitigation, the allowance was uplifted from 1% to 3% of the Capex cost. At SOC stage, biodiversity net gain legislation was not in place and so a 1% cost allowance was thought appropriate. Further development of the design and mitigation solutions to reduce the scheme's BNG impact and subsequently provide enhancements will be required to give a more robust cost estimate.

### 2.1.10 Site Investigation

The cost of ground investigations has been estimated in key areas of the scheme based on the desk studies provided. These estimates are provided in Table 4. Nominal allowances have been made in other areas to cover topographical surveys and utilities searches.

| Location | Onshore boreholes | Marine boreholes | CPTs |
|---|---|---|---|
| Entrance Lock | 15 | 5 | 10 |
| Cumberland Rd | 16 | 0 | 16 |
| City Centre | 18 | 0 | 18 |
| St Phillip's | 30 | 0 | 30 |
| Netham Lock | 10 | 5 | 10 |
| TOTAL | **89** | **10** | **84** |

**Table 3: Estimated GI requirements by area**

| Location | Onshore boreholes | Marine boreholes | CPTs | Total |
|---|---|---|---|---|
| Entrance Lock | £273,000 | £617,500 | £19,500 | £910,000 |
| Cumberland Rd | £357,500 | £- | £32,500 | £390,000 |
| City Centre | £357,500 | £- | £32,500 | £390,000 |
| St Phillip's | £533,000 | £- | £52,000 | £585,000 |
| Netham Lock | £175,500 | £585,000 | £19,500 | £780,000 |
| TOTAL | **£1,696,500** | **£1,202,500** | **£156,000** | **£3,055,000** |

**Table 4: Estimated GI costs**

### 2.1.11 Staff and consultants

A detailed buildup of expected Bristol City Council staff costs and consultant costs was prepared, based on assumed programme of construction works of 8 years. Further refinement of these allowances will be possible once a detailed contractor's programme has been prepared for tendering prior to award of the Full Business Case.

The total allowance equates to additional circa 16% on top of the CAPEX costs for phase 1. Specific allowances by resource type and seniority level and rate are included in the 'Staff and Consultants' section of the estimate. The total cost of staff and consultants has been estimated as approximately £15.1m. This allowance has been split across the proposed FBC development and construction programme, with ~£11.8m being required prior to FBC submission in 2028, and the remainder covering construction support.

### 2.1.12 Compensation

Compensation allowances have remained unchanged at 5% on top of the CAPEX cost, following comparison with other similar schemes. It is recommended further input is provided from a land agent with regard to compensation costs expected as the scheme develops to ensure robust allowances are included.

### 2.1.13 Optimism Bias

Optimism Bias was reviewed and updated in line with Table 5.

| Risk components contributing to above factors | | Average % Risk Component for Flood Defence Projects | Non-PFR defences | PFR |
|---|---|---|---|---|
| **Procurement** | Late contractor involvement in design | 1 | 1 | 1 |
| | Dispute and claims occurred | 11 | 11 | 11 |
| | Other | 1 | 1 | 1 |
| **Project specific** | Design complexity | 4 | 3 | 2 |
| | Degree of innovation | 4 | 1 | 1 |
| | Environmental impact | 13 | 13 | 3 |
| | Other | 9 | 9 | 9 |
| **Client specific** | Inadequacy of the Business Case | 23 | 12 | 12 |
| | Funding availability | 2 | 3 | 3 |

| Risk components contributing to above factors | | Average % Risk Component for Flood Defence Projects | Non-PFR defences | PFR |
|---|---|---|---|---|
| | Project management team | 1 | 1 | 1 |
| | Poor project intelligence | 8 | 6 | 6 |
| **Environment** | Public relations | 5 | 5 | 5 |
| | Site characteristics | 4 | 4 | 2 |
| **External influences** | Economic | 5 | 5 | 5 |
| | Legislation/regulations | 4 | 4 | 3 |
| | Technology | 4 | 1 | 1 |
| | Other | 1 | 1 | 1 |
| | **TOTAL** | **100** | **81** | **67** |
| **Optimism bias %** | | **60** | **49** | **41** |

**Table 5: Optimism bias calculation**

### 2.1.14 Risk allowance

The Strategy's delivery risk register has been updated (see Appendix H of the Outline Business Case). The remaining identified risks have been qualitatively and quantitatively analysed to determine their cost and programme impacts, as well as likelihood of occurrence. Those with the highest impact include:

- Delays to project delivery due to challenge, stakeholder agreement and the change in governance at BCC expected in 2024.
- Adverse ground conditions
- Landowner and occupier agreements
- Temporary works and traffic management or restrictions

This data has been used to inform probability modelling, also known as a Monte Carlo analysis, of the required risk allowance in the scheme. The 50th percentile risk value is £9.0m, and the 95th percentile value is £18.5m. The 95th percentile represents more of a worst case scenario of risk materialising and subsequent costs. 50th percentile represents a credible average level of risk materialising.

| Risk ID | Residual probability (%) | Least cost (£) | Most likely cost (£) | Max cost (£) | Weighted PERT |
|---|---|---|---|---|---|
| 1 | 40% | 5,000 | 1,500,000 | 6,000,000 | £ 2,000,000 |
| 3 | 30% | 5,000 | 300,000 | 1,200,000 | £ 400,000 |
| 6 | 5% | 5,000 | 30,000 | 60,000 | £ 31,000 |
| 8 | 50% | 5,000 | 30,000 | 60,000 | £ 31,000 |
| 9 | 40% | 5,000 | 30,000 | 60,000 | £ 31,000 |
| 10 | 20% | 5,000 | 30,000 | 60,000 | £ 31,000 |

| Risk ID | Residual probability (%) | Least cost (£) | Most likely cost (£) | Max cost (£) | Weighted PERT |
|---|---|---|---|---|---|
| 11 | 40% | 5,000 | 30,000 | 60,000 | £ 31,000 |
| 12 | 40% | 5,000 | 30,000 | 60,000 | £ 31,000 |
| 14 | 60% | 50,000 | 475,000 | 1,295,000 | £ 500,000 |
| 23 | 40% | 25,000 | 50,000 | 500,000 | £ 100,000 |
| 27 | 20% | 10,000 | 100,000 | 500,000 | £ 200,000 |
| 30 | 20% | 10,000 | 1,500,000 | 6,000,000 | £ 2,000,000 |
| 31 | 40% | 700,000 | 1,400,000 | 7,000,000 | £ 2,200,000 |
| 32 | 20% | 5,000 | 30,000 | 60,000 | £ 30,000 |
| 33 | 50% | 50,000 | 250,000 | 5,000,000 | £ 1,000,000 |
| 34 | 25% | 1,000,000 | 2,500,000 | 6,000,000 | £ 2,800,000 |
| 35 | 20% | 2,500,000 | 5,000,000 | 12,500,000 | £ 5,800,000 |
| 36 | 20% | 2,500,000 | 5,000,000 | 12,500,000 | £ 5,800,000 |
| 37 | 20% | 2,500,000 | 5,000,000 | 12,500,000 | £ 5,800,000 |
| 38 | 5% | 500,000 | 1,000,000 | 5,000,000 | £ 1,600,000 |
| 40 | 20% | 100,000 | 500,000 | 5,000,000 | £ 1,200,000 |
| 41 | 5% | 100,000 | 500,000 | 5,000,000 | £ 1,200,000 |
| 43 | 20% | 1,250,000 | 2,500,000 | 5,000,000 | £ 2,700,000 |
| 44 | 20% | 400,000 | 800,000 | 4,000,000 | £ 1,300,000 |
| 52 | 50% | 5,000 | 1,500,000 | 6,000,000 | £ 2,000,000 |
| 53 | 25% | 5,000,000 | 10,000,000 | 25,000,000 | £ 11,700,000 |

**Table 6: Summary of weighted risks for analysis**

| Percentile | Value |
|---|---|
| 5% | £2,603,333 |
| 10% | £3,633,000 |
| 15% | £4,381,750 |
| 20% | £5,180,500 |
| 25% | £5,809,167 |
| 30% | £6,381,083 |
| 35% | £7,024,167 |
| 40% | £7,720,833 |
| 45% | £8,382,500 |

| Percentile | Value |
|---|---|
| **50%** | **£8,987,917** |
| 55% | £9,650,833 |
| 60% | £10,303,833 |
| 65% | £11,037,458 |
| 70% | £11,767,583 |
| 75% | £12,558,958 |
| 80% | £13,573,667 |
| 85% | £14,655,208 |
| 90% | £16,148,917 |
| **95%** | **£18,468,875** |

**Table 7: Output of Monte Carlo probability analysis**

# 3. Summary

Following the work summarised above, the total cost of the scheme in phase 1, split by reaches, is given in Table 8. It should be noted that this is prior to the addition of inflation and risk (including optimism bias).

| Ref | Reach Title | CAPEX | Service Diversions | Environment Mitigation | Site surveys | Staff & Consultants | Compensation | Total |
|---|---|---|---|---|---|---|---|---|
| 1-3 | Pill | £6,793,800 | £169,800 | £208,900 | £20,000 | £748,700 | £348,200 | £8,289,400 |
| 4-6 | Shirehampton | £1,529,600 | £15,300 | £46,300 | £20,000 | £156,800 | £77,200 | £1,845,200 |
| 7-12 | Sea Mills | £3,439,400 | £49,200 | £104,700 | £20,000 | £545,300 | £174,400 | £4,333,000 |
| 13-19 | Bower Ashton | £4,360,000 | £48,500 | £132,300 | £20,000 | £1,015,900 | £220,400 | £5,797,100 |
| 20 | Hotwell Road | £224,900 | £1,800 | £6,800 | £20,000 | £143,200 | £11,300 | £408,000 |
| 21-27 | Entrance Lock / Western Harbour | £25,678,800 | £925,900 | £798,100 | £910,000 | £2,428,700 | £1,330,200 | £32,071,700 |
| 28-29 | Cumberland Road | £16,483,300 | £824,200 | £519,200 | £390,000 | £2,797,600 | £865,400 | £21,879,700 |
| 30-31 | Commercial Road | £9,715,700 | £214,700 | £297,900 | £195,000 | £853,900 | £496,500 | £11,773,700 |
| 32 | Clarence Road | £7,328,700 | £366,400 | £230,900 | £195,000 | £1,518,800 | £384,800 | £10,024,600 |

| Ref | Reach Title | CAPEX | Service Diversions | Environment Mitigation | Site surveys | Staff & Consultants | Compensation | Total |
|---|---|---|---|---|---|---|---|---|
| 33 | Cattle Market Road | £1,208,500 | £60,400 | £38,100 | £20,000 | £206,500 | £63,400 | £1,596,900 |
| 35 | St Philip's Marsh | £10,719,300 | £536,000 | £337,700 | £585,000 | £1,496,100 | £562,800 | £14,236,900 |
| 36 | St Philip's Marsh | £201,400 | £2,000 | £6,100 | £20,000 | £28,300 | £10,200 | £268,000 |
| 37-39 | Feeder Road | £5,502,900 | £251,900 | £172,600 | £20,000 | £1,198,000 | £287,700 | £7,433,100 |
| 40-43 | Netham Lock | £9,598,600 | £264,900 | £295,900 | £780,000 | £1,495,400 | £493,200 | £12,928,000 |
| 44-45 | Whitby Road | £836,700 | £14,800 | £25,500 | £20,000 | £153,800 | £42,600 | £1,093,400 |
| 46-47 | St Anne's | £24,023,000 | £874,900 | £746,900 | £20,000 | £3,594,100 | £1,244,900 | £30,503,800 |
| 48 | Chapel Way | £1,516,500 | £15,200 | £46,000 | £20,000 | £269,600 | £76,600 | £1,943,900 |
| 49-50 | Pump House Lane | £708,300 | £17,500 | £21,800 | £20,000 | £110,800 | £36,300 | £914,700 |
| 51 | Riverside Cottages | £110,100 | £1,100 | £3,300 | £20,000 | £209,500 | £5,600 | £349,600 |
| 52-53 | Hanham Mills | £330,000 | £2,500 | £10,000 | £20,000 | £47,200 | £16,600 | £426,300 |
| 54 | Beeses Bar | £10,000 | £0 | £300 | £0 | £1,400 | £500 | £12,200 |
| 55-60 | Keynsham | £2,187,800 | £48,300 | £67,100 | £0 | £480,400 | £111,800 | £2,895,400 |
| 61 | Broadmead Lane Industrial Estate | £5,622,800 | £281,100 | £177,100 | £20,000 | £1,250,100 | £295,200 | £7,646,300 |
| 62 | Bitton | £50,000 | £0 | £1,500 | £0 | £7,200 | £2,500 | £61,200 |
| 63 | Swineford | £310,000 | £0 | £9,300 | £0 | £44,400 | £15,500 | £379,200 |

**Table 8: Summary of construction costs in 2023 before risk and inflation**

Risk allowances are dependent on the percentile reported, as per 2.1.14. Optimism bias as calculated in 2.1.13 on the 2023 costs above is £87.5m. It should be noted that in further OBC reporting, inflation will have been applied to this figure.

# 4. Key sensitivities

Given the scale of project and the time between this cost estimate and finalisation of construction costs, the overall price is subject to significant change. In particular, the price is sensitive to the factors listed below. It should however be noted that the risk allowances and optimism bias are expected to subsequently reduce as the project certainty increases:

- Inflation – in particular for construction materials prices.
- Levels of disruption – as noted, if the impact of the temporary works has to be reduced, this will increase both price and programme.
- Ground conditions – particularly onerous ground conditions will likely increase foundation size and subsequently price.
- Cost of specialist items such as lock gates
- Key interfaces leading to design changes – in particular with Network Rail, heritage assets and areas of growth and regeneration.

# 5. Comparison with SOC

Given the significant changes to the project requirements (and therefore design), programme and availability of information, direct comparison with the SOC cost estimate is difficult. However, a phase one cost of £216m was estimated at SOC, and the latest cost at time of reporting at OBC is £255m (including 95$^{th}$ percentile risk). Some of the reasons for these changes are summarised below:

- Alterations to unit rates to present day prices due to inflationary pressure (significant increases)
- Assumed FBC date revised from 2025 at SOC to 2028 at OBC (significant increase)
- Updated lengths and heights for planned assets based on revised hydraulic modelling (various changes)
- Updated asset types (various changes, including significant Cumberland Road cost savings)
- Revised allowances for placemaking (various changes)
- Lump sum allowances increased based on early supplier involvement.
- Revised allowances for:
    - Service Diversions (reduced)
    - Environmental Mitigation (increased)
    - Site Investigation (reduced)
    - Staff and Consultants
    - Optimum Bias (reduced)
    - Risk – increased allowance from costed risk register

Figure 1 illustrates the scale of some of these cost changes. As demonstrated in this note and the wider OBC, there are a large number of interconnected factors affecting the capital cost and the basis of cost reporting, therefore these costs should be taken as indicative values. However, they do demonstrate the significant ‘real terms’ savings brought at this stage in the scheme development.

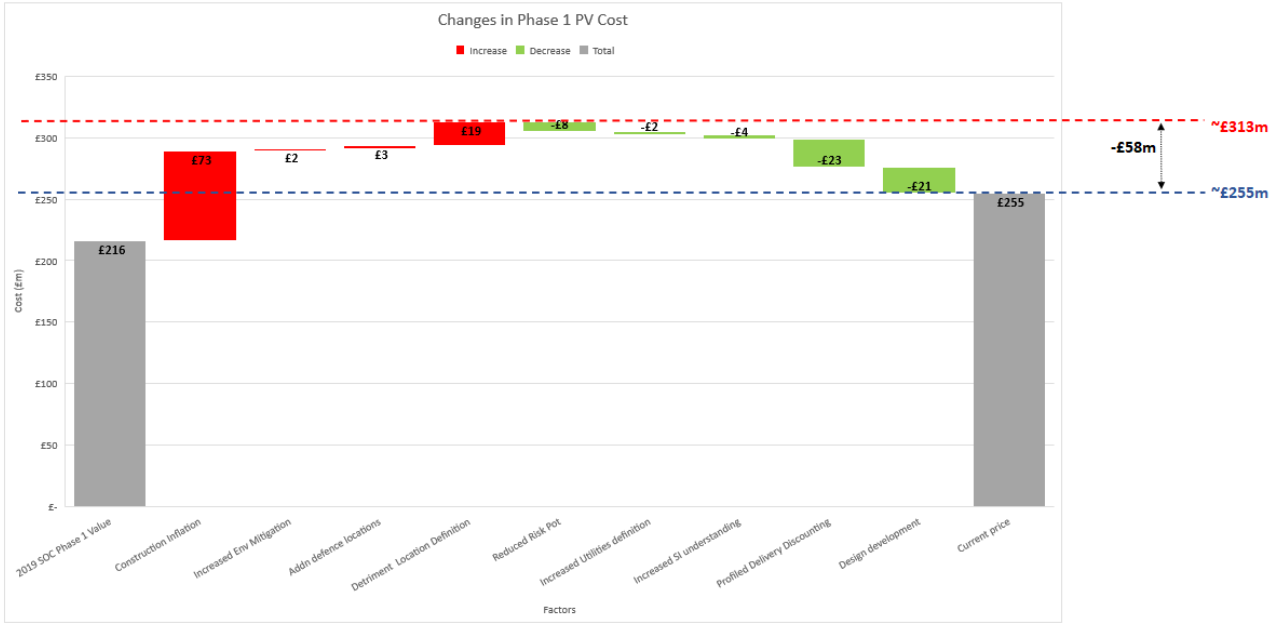


**Figure 1: Illustration of change in capital cost for BAFS phase 1**