

COAST TO CAPITAL

Shoreham Western Harbour Arm Flood Defences

Adur District Council

Full Business Case

Purpose

"Successful project delivery starts with a good business case"



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1 Executive Summary

- 1.1 A sum of £3.5 million was identified for flood defences to unlock developments on Shoreham’s Western Harbour Arm in Local Growth Fund Round 2. This business case seeks approval to draw down this funding to deliver a flood risk management scheme at Sussex Yacht Club on the Western Harbour Arm. The proposed flood defence will be located adjacent to the historic harbour town of Shoreham-by- Sea, West Sussex, and thus this scheme will safeguard existing town centre businesses as well as provide an unrestricted flow of traffic on the A259. This is a change project supported by the approved Rivers Arun to Adur Flood and Erosion Management Strategy (the Strategy). The scheme is delivered in partnership with the Environment Agency and West Sussex County Council (WSCC) with Adur District Council as the lead organisation.

- 1.2 The Western Harbour Arm Flood Defence Improvement scheme covers a 1.9 km stretch of the river, between the River Adur Footbridge and Kingston Wharf in Shoreham-by-Sea. The site lies wholly to the south of the A259 road and comprises a mix of commercial and industrial uses often associated with Shoreham Port. The Western

Harbour Arm is identified in Adur District Council planning policy as a major area for regeneration for new housing, enterprise and retail. However, a Strategic Flood Risk Assessment identifies the site as having a high flood risk from tidal flooding which stymies development, growth and economic investment. The Environment Agency guidance advises that any construction for homes or business will require a new flood defence scheme to protect future occupants. Across the Western Harbour Arm the majority of the sites are being promoted for development by private housing developers. The Council have prepared design guidance and plans to support their comprehensive delivery, including having a shared approach to flood defences across all of the developments.

- 1.3 The flood defence scheme proposed in this business case looks to address the weakest part of Western Harbour Arm which is at Sussex Yacht Club. The Sussex Yacht Club site is owned by the members of the Yacht Club and is a popular community club in the area. As it is a community use, and due to the lack of alternative locations for the club, there is no potential for private sector investment to deliver flood defences at this location. Therefore, an intervention using public sector funds is essential to deliver a flood defence solution at this location.
- 1.4 The Sussex Yacht Club is situated on the northern bank of the River Adur directly adjacent to Shoreham Town Centre. The Yacht Club presently includes slipways (often referred to as “hards”) and a large number of gangways and pontoons on which to moor boats. The existing river frontage has numerous deviations in line formed by the various slipways, inlets, and pontoons. It is typically formed from a sloping concrete revetment system and concrete quay walls. Much of the site is relatively low lying with levels surveyed across the site varying from 3.42m AOD and 4.16m AOD. The existing river frontage was surveyed in 2010 by Maltby Land Surveys and recorded levels of between 3.18 m AOD and 3.95m AOD. Vehicular access to the site is from the A259.
- 1.5 The existing flood risk through the Sussex Yacht Club site is significant. The 2010 River Adur hydraulic model shows that the site is almost entirely flooded in the 1 in 20-year tidal flood event. The site, along with the adjacent Tarmount Hard, provide a flow route for flooding of the Brighton Road as observed during flooding events in the winter of 2013/14. Flood area extents for larger magnitude events do not increase considerably as they are constrained by the increase in ground levels along and to the north of the A259.
- 1.6 Flood levels for the 1 in 200-year event including the effects of climate change are listed below. The difference between existing site levels (3.42 AOD and 4.16 AOD) and the potential 1 in 200 year event demonstrate the significant depth of flooding that is possible in an extreme event.

Year	Still Water Levels @ Sussex Yacht Club
Present Day	4.33m AOD
2035	4.45m AOD
2070	4.69m AOD
2082	4.79m AOD
2115	5.08m AOD

- 1.7 Delivering a flood defence at Sussex Yacht Club is a priority intervention as flooding at this location leads to closure of the A259 (Brighton Road) even in moderate flood events. Following consultation with the Yacht Club the Flood Risk Management Guide Supplementary Planning Document 2015 (SPD15) proposed a line of defence on the riverward side of the Yacht club formed from Steel Sheet Piles with a reinforced concrete capping beam. To preserve access to the waterfront flood gates would also need to be included within the defence line. Following the publication of the SPD15 further discussions were held with the yacht club where they wanted to explore an alternative the defence of their land to ensure that the Yacht Clubs easy access to the river is maintained.
- 1.8 Adur District Council appointed JBA consultants in 2015 to identify suitable options for a flood defence at the Sussex Yacht Club and to provide cost estimates for submission to the LEP.
- 1.9 JBA considered the basic form of each defence, no structural analysis or ground investigation was undertaken. A small amount of additional survey data was collected by taking spot levels across the site to better understand the required height of the flood wall solution.
- 1.10 In each instance there is a requirement for a tie-in with the flood wall on the Parcellforce site that is being delivered by the private sector. It was assumed that Tarmount Hard will remain and that this tie in will be by the provision of a flood gate to a level of 5.25mAOD. The flood gate is expected to be formed from two leaves and open outwards although this is to be confirmed at detailed design stage subject to access requirements.
- 1.11 The defence level was set at 5.08mAOD which represents the still water level across the entire Western Harbour Arm for the 1 in 200-year 2115 event. A minimum freeboard of 150mm has been specified for all defences and the target crest level has been set as 5.25mAOD.
- 1.12 The preferred option identified is the construction of a new flood wall following the alignment of the northern boundary (A259) but set 3.5m closer to the river (requiring the demolition of the existing Sussex Yacht Club clubhouse). The option requires the District Council to purchase a 3.5 metre wide strip of land (compulsorily or by agreement) from Sussex Yacht Club on which to build the flood defence wall. To enable this the Council will purchase a 3.5 metre strip of land along the Sussex Yacht Club frontage at a price that reflects its land value. The purchase price would reflect the replacement costs of the existing buildings and be agreed with the District Valuer.
- 1.13 This set back flood wall requires the existing clubhouse at the Yacht Club to be demolished to allow the wall to be constructed along a boundary line 3.5m closer to the river than at present. The provision of a new clubhouse does not form part of this proposal. The flood wall will be constructed with a reinforced concrete core to the design level of 5.08mAOD. The core will be brick clad with flint panels and a coping layer will extend to the final height of 5.25mAOD. By moving the site boundary 3.5m closer to the river this will create a space for a footway and cycleway. The design of the cycleway would be specified by West Sussex County Council to the National Cycle Network

Guidelines; this has been included within the costs of the overall scheme. This option proposes to relocate the existing entrance further to the west of the site. The site entrance will also require a flood gate to a level of 5.25mAOD to ensure the continuity of the defence. This is expected to be two gates that will open into the site. The costs associated with this option do not include for a new clubhouse.

- 1.14 The proposed scheme is essential to protect the most vulnerable flooding location in Shoreham Town Centre with a significant recent history of flood incidents. The scheme will, in combination with the upper reaches flood defence scheme being delivered by the Environment Agency and through private developers along the remainder of Western Harbour Arm, ensure that there is a complete flood defence from Kingston Beach to Shoreham Footbridge. This will ensure that there is a complete “flood cell” and prevent water surcharging around other flood defences. A key economic benefit of the scheme is that through delivering this intervention the remaining developers will have confidence that a comprehensive flood solution can be delivered. This will reduce the risk for private sector development proposals. The scheme will therefore be a catalyst for significant private investment delivering up to 1450 new homes, employment and retail development.
- 1.15 At a general meeting of the yacht club on 03/09/2016 they shareholding members of the club approved the principle of selling the strip of land to the Council and authorised their executive members to negotiate with the Council. The proposed scheme has support from key partners including the Environment Agency, adjoining land owners and developers along Western Harbour Arm (please see supporting material).
- 1.16 Proposed works will be project managed and delivered by Adur District Council in cooperation with the Environment Agency and West Sussex County Council.

2 Strategic Case

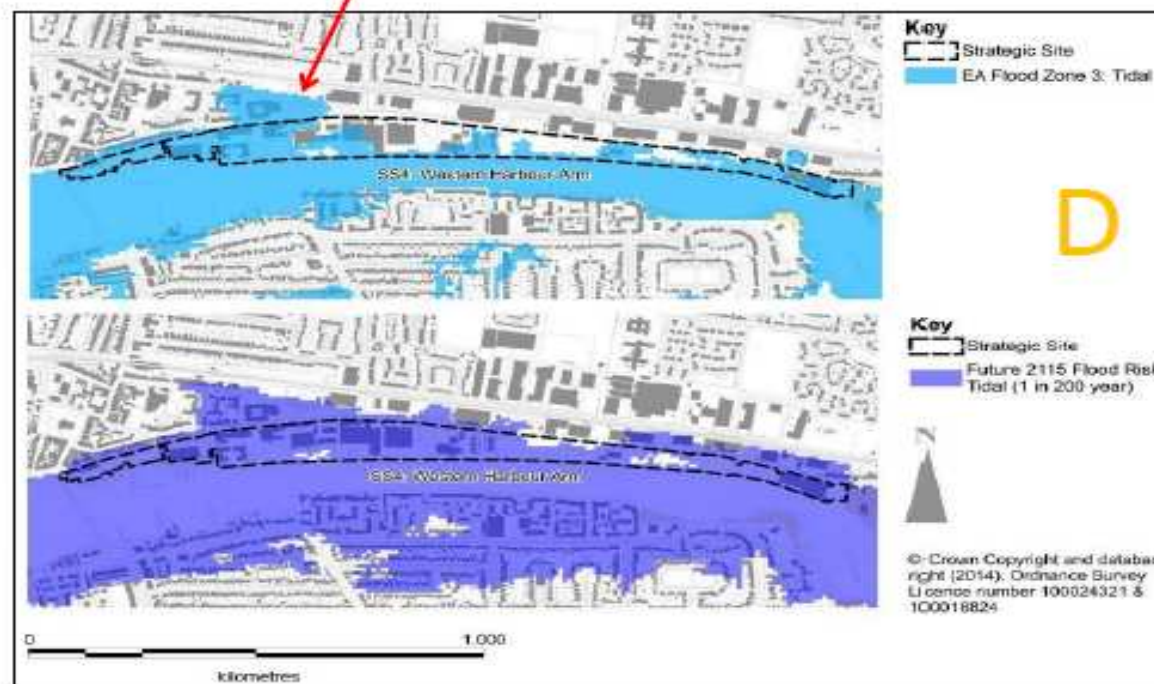
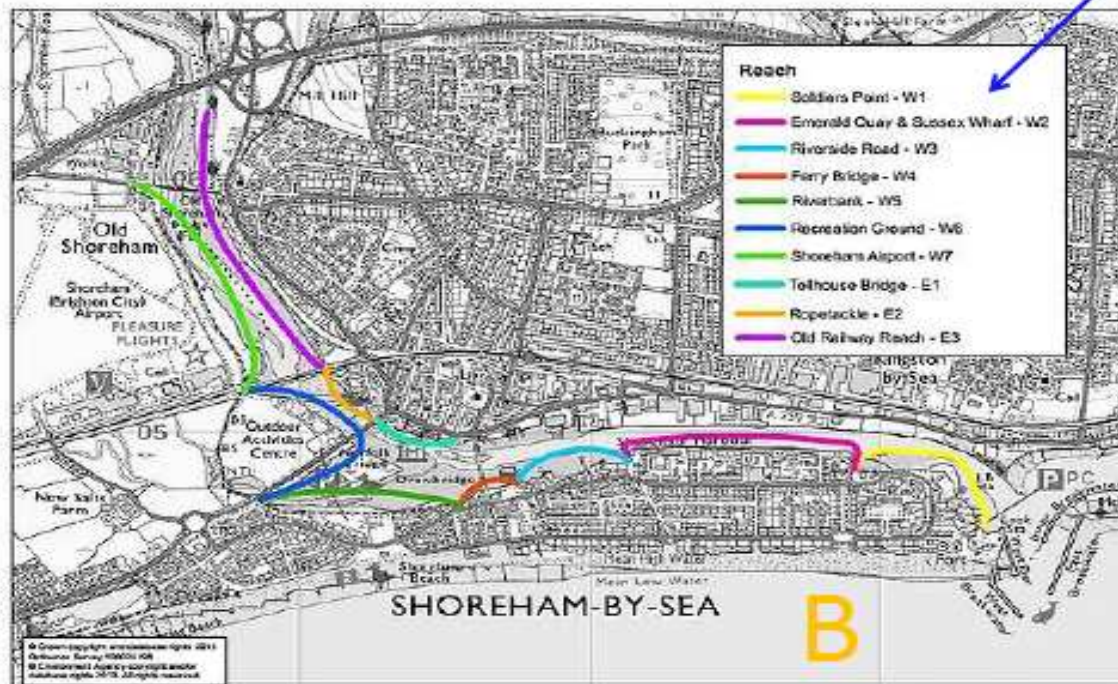
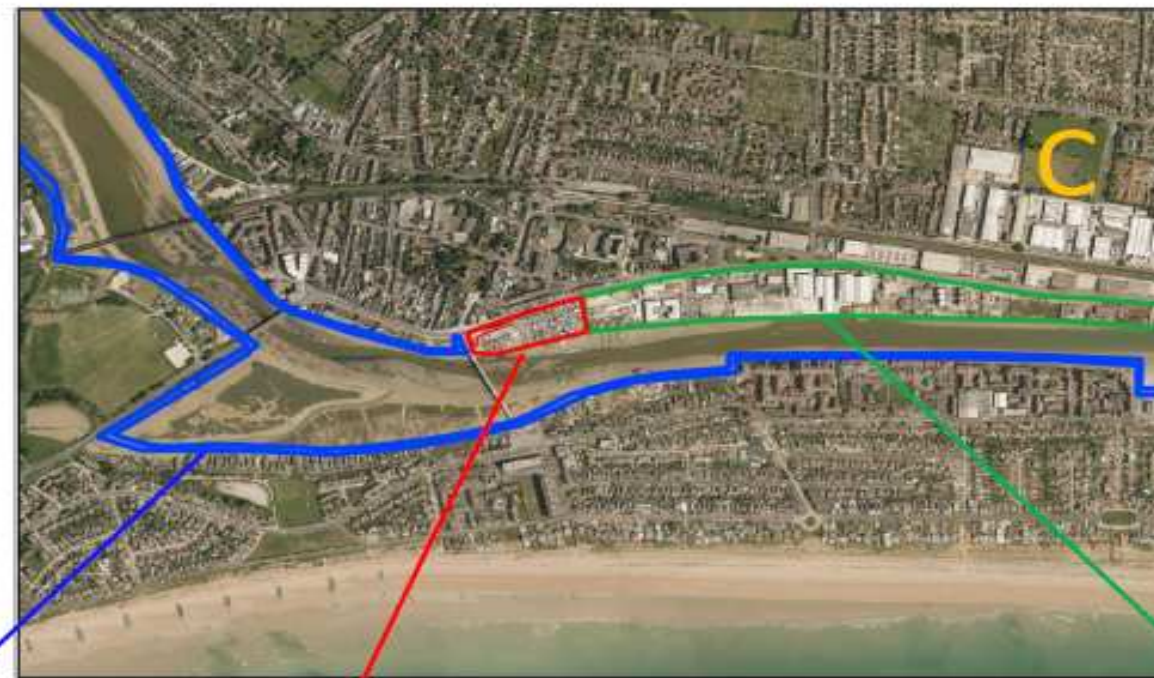
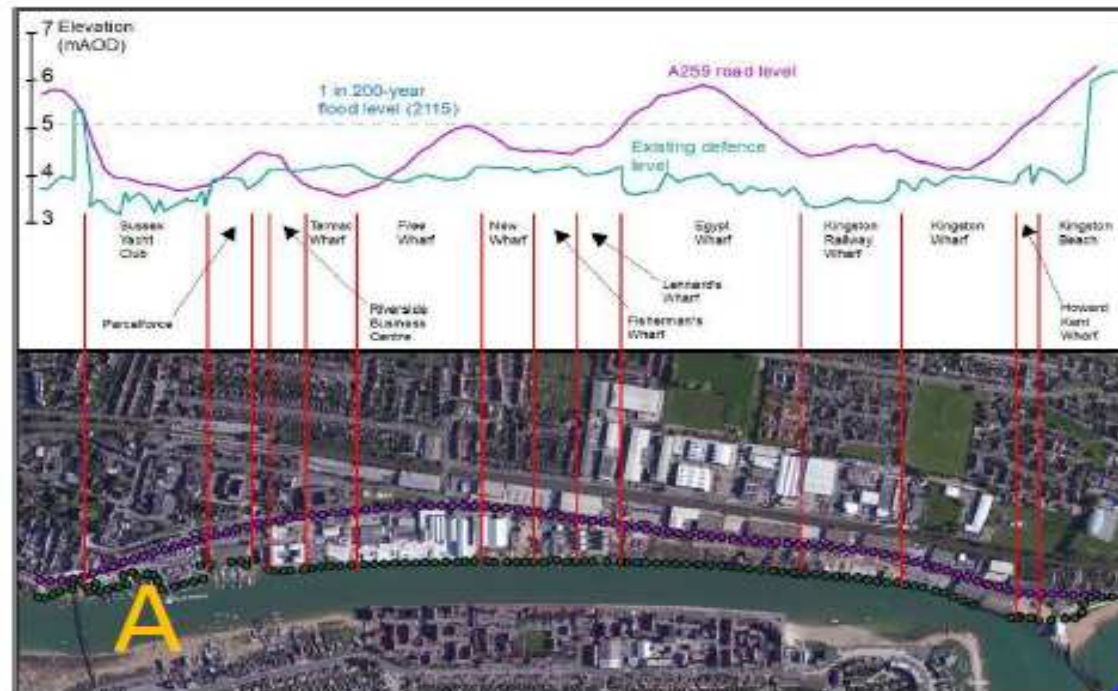
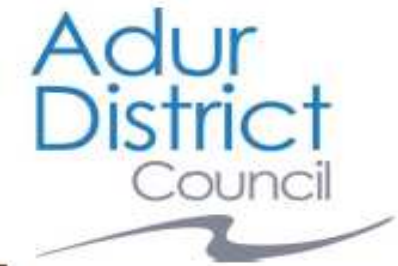
2.1 Introduction

- 2.1.1 The purpose of this section is to explain and revisit how the scope of the proposed project fits within the existing strategies of Adur District Council (ADC), the Environment Agency, and Coast to Capital Local Enterprise Partnership.
- 2.1.2 Adur District Council wishes to direct a total (public and private) investment of over £12m to deliver new flood defences at Western Harbour Arm to support the development and regeneration of the area. The delivery of the total project funding will consist of £3.5m of grant funding from Coast to Capital LEP arising from Local Growth Fund Round 2; and up to £1.2m of Flood and Coastal Risk Management grant (pending submission of a business case to the Environment Agency) and over £7.3m from development sites from forthcoming developments
- 2.1.3 The £3.5m of grant funding from Coast to Capital LEP will be targeted on delivering flood defences at the Sussex Yacht Club on the western end of the Western Harbour Arm as this is the weakest point and source of numerous recent flooding incidents.
- 2.1.4 A detailed geographical context explaining the context of the site in terms of the existing flood defence scheme, elevations, flood risk areas, and plan are set out in the diagrams below.

Reference: Local Growth Fund (Round 2)

Applicant: Adur District Council

Project: Western Harbour Arm – Flood Defences (geographical context)



The Sussex Yacht Club site is the only part of the Western Harbour Arm that is not allocated for mixed use redevelopment through the emerging Shoreham Harbour Joint Area Action Plan and the Adur Local Plan. The elevation diagram (A) illustrates that both the existing defences and the level of the A259 in this area are below the 1 in 200-year flood level. To the west of the yacht club, the Adur Tidal Walls scheme (B) will provide protection. Sites to the east of the yacht club, highlighted in green, as far as Kingston Beach are allocated for mixed use redevelopment through the Joint Area Action Plan. These sites, and associated flood defence improvements will be delivered by private developers as individual sites come forward (C). This leaves the Sussex Yacht Club as the only vulnerable site; due to its close proximity to the town centre and prominent businesses along the A259 (D).

Reference: Local Growth Fund (Round 2)

Applicant: Adur District Council

Project: Western Harbour Arm – Flood Defences (scheme context)

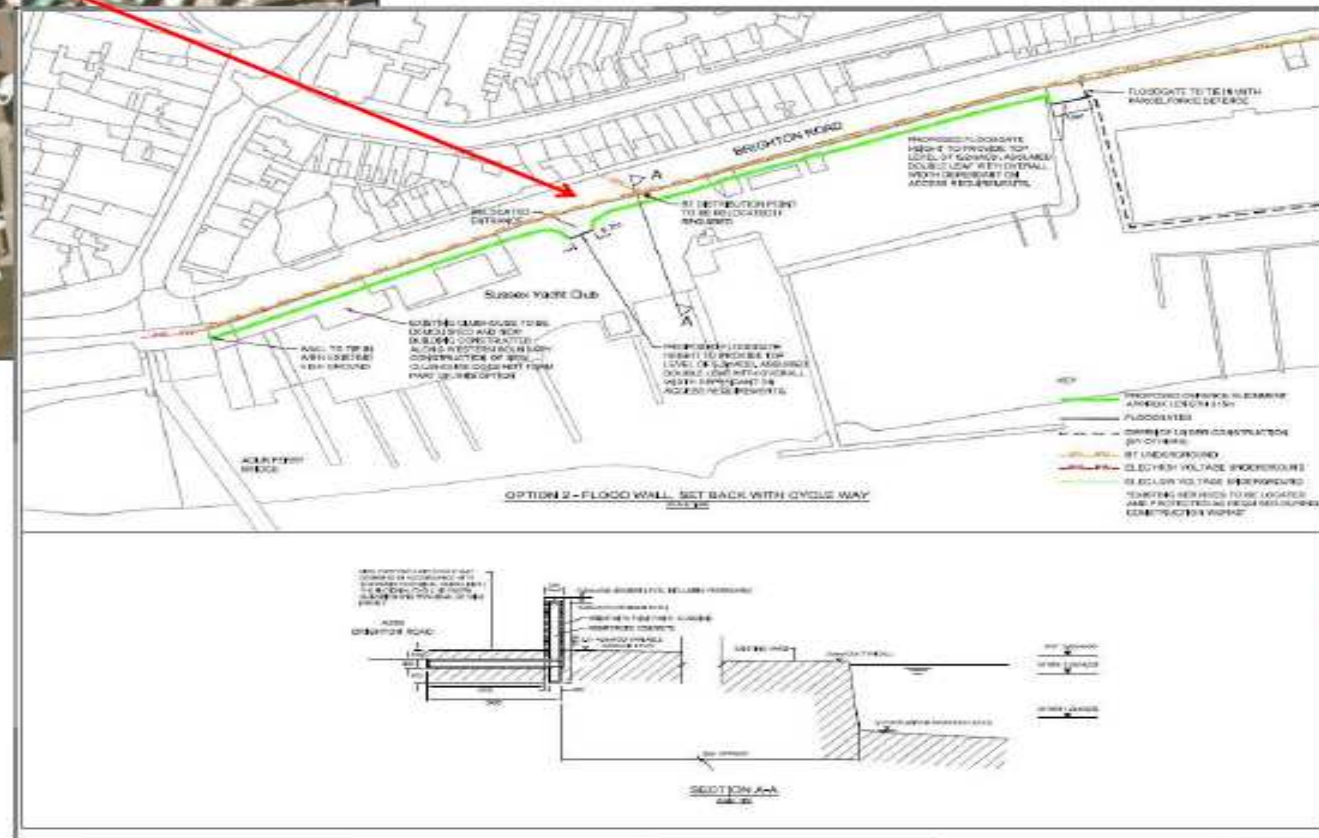


*Indicative drawing (not to scale)



These drawings represent the following:

- Top left:-** Red line shows the 315m by 3.5m strip of land to be purchased. In purchasing the land this will include extinguishing the Sussex Yacht Club clubhouse to build the flood defence solution.
- Bottom left:-** Showing the context of the Yacht Club against the key local areas of benefit and the adjoining parcels of land along the Western Harbour Arm
- Bottom right:-** Showing the solution, Option B, as per JBA addendum report. This represents the best value solution against all factors, risks and partner negotiations.



NO.	DESCRIPTION	DATE	BY	CHECKED	STATUS
1	Issue for Information	12/01/2023	ADUR	ADUR	Information
2	Issue for Comment	12/01/2023	ADUR	ADUR	Information
3	Issue for Approval	12/01/2023	ADUR	ADUR	Information
4	Issue for Construction	12/01/2023	ADUR	ADUR	Information

<p>ADUR DISTRICT COUNCIL</p> <p>PLANNING DEPARTMENT</p> <p>100, WESTERN HARBOUR ARM, WEST SUSSEX BN1 3QJ</p> <p>01323 353100</p> <p>www.adur.gov.uk</p>	<p>ADUR DISTRICT COUNCIL</p> <p>PLANNING DEPARTMENT</p> <p>100, WESTERN HARBOUR ARM, WEST SUSSEX BN1 3QJ</p> <p>01323 353100</p> <p>www.adur.gov.uk</p>
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2.2 Business need – the problem that needs to be addressed

Strategic Importance of Adur District and Shoreham

- 2.2.1 The Coast to Capital Local Economic Partnership (the LEP) has identified Shoreham Harbour and Airport as a strategic business and employment locations within the LEP Area. As such the LEP envisages that Shoreham is a location that they expect to see growth now and in the future. The LEP identifies the Shoreham Harbour Regeneration Project as a key initiative which is “dependent on the delivery of a comprehensive flood defence solution which is estimated to cost £12million”. The regeneration project proposes a sustainable mixed use development delivering up to 1,450 new homes, and 21,500sqm of employment floorspace (creating up to 1,700 new full time jobs).” (Coast to Capital Strategic Economic Plan 2015).
- 2.2.3 The Strategic Economic Plan sets out that a key constraint in delivering housing and employment growth across these sites is “the risk of flooding and the current uncertainty regarding funding for comprehensive flood defences to the River Adur and the Harbour area”. It continues that “the provision of a comprehensive flood defence wall at the Harbour is essential to deliver the new homes and jobs envisaged as part of the Shoreham Harbour Regeneration Project”.
- 2.1.3 The Strategic Economic Plan therefore establishes that Shoreham is a key location for growth and investment in the town’s infrastructure specifically flood infrastructure is essential to its long term success.

Strategic Case for Flood Defences on Western Harbour Arm

- 2.2.4 The strategic need for Coastal Defence works is established in the Beachey Head to Selsey Bill Shoreline Management Plan, approved in February 2010. The study identifies that sea level rise resulting from climate change is likely to significantly impact on coastal areas in the area. It identifies that the main aspect of the coastal frontage is entirely urban with a predominantly residential character. Other than residential properties and roads, major infrastructure on or behind the frontage is limited to the harbours at Littlehampton and Shoreham-by-Sea which are integral to the economy of the area.
- 2.2.5 The high level recommended approach is to continue to protect existing coastal defence assets through holding the line, defencing the present situation. The urban areas of Shoreham-by-Sea, Lancing and Sompting are popular tourist destinations and service centres for the sub region, providing a range of amenities and recreational facilities that support the surrounding communities. The area also supports a high number of environmental and historical assets. This policy is sustainable in the long-term as it protects an area of high economic and environmental value.
- 2.2.6 The strategic options for delivering these flood defences are considered in the Rivers Arun to Adur Flood and Erosion Management Strategy (the Strategy) which describes the 100-year plan for managing flood and erosion risk for a 32km tidal frontage in West Sussex, covering the lower tidal reaches of the Rivers Arun and Adur and the coastline in between. The Strategy area covers the stretch of urbanised coastline from the east bank of the River Arun in Littlehampton including the coastline moving east past Worthing to include both the east and west banks of the River Adur, downstream of the A27, in Shoreham-by-Sea (TQ 241 049).
- 2.2.7 The Strategy was developed by the Environment Agency in partnership with the other Operating Authorities; Arun District, Worthing Borough and Adur District Councils and

was approved by the Environment Agency's Board in May 2009 and adopted by Defra in April 2010.

- 2.2.8 The Strategy area is divided into nine Operational Management Units (OMUs). The River Adur OMU 9 defends Shoreham-by-sea on the east bank of the Adur. The approved strategy option for the "central" area of the OMU covered by the site is "sustain the east bank, central section, by raising the existing defences to take account of sea level rise while providing the same standard of protection."

Particular Benefit of Flood Defence Improvements at Sussex Yacht Club

- 2.2.9 The existing flood defence is a concrete blockwork revetment. The line of defence is complex as it steps in and out from the river to accommodate the slipway and hards (refer to Figure 7.4 65). The defences, which are currently at a level of between 3.1m AOD and 3.9m AOD, provide a standard of protection of less than the highest astronomical tide (which is 3.63m AOD at this location) and the A259 has been flooded from the site. The levels on the A259 fall away from 5.4m AOD at the Adur Ferry Bridge to 3.7m AOD at Tarmount Hard.
- 2.2.10 In flood risk terms the site is the weakest point in the network as the low crest levels of the existing defences offers a preferential route for flooding to affect a wider area of Shoreham town centre and could potentially allow flood waters in behind new defences constructed on adjacent sites.
- 2.2.11 The proposed flood defence therefore provides a suitable solution at the weakest point in the existing flood defence network, protecting retail and residential properties in Shoreham town centre, protecting the A259 a heavily trafficed main road, and delivering confidence to private sector developers that there will be a comprehensive flood solution along the Western Harbour Arm.
- 2.2.12 The proposed flood defence will also improve public realm and sustainable transport in the area. A key aim for West Sussex County Council's Transport Plan 2011 - 2026 is the creation of a cycle path along the west bank of the River Adur. The proposed scheme will deliver a new cycle and footpath at a key location where the road currently narrows and suffers congestion at peak times.

2.3 The Project

2.3.1 Description

- 2.3.2 Growth Deal funding was awarded to help deliver a comprehensive flood defence solution for the Western Harbour Arm. The Western Harbour Arm comprises a 1.9 km long length of river frontage in multiple ownerships. The sites are identified in planning policy for the development of over 1,450 homes in a phased development across the sites, along with retail, commercial and other community infrastructure. The project seeks to address the flood defence requirements on the western end of the Western Harbour Arm on land owned by Sussex Yacht Club.
- 2.3.3 The various sites along Western Harbour Arm is in multiple ownerships. The Council have prepared a Flood Defence Guidance SPD to ensure that each site takes the same approach and ensure a comprehensive solution is delivered. As the Sussex Yacht Club site has development potential there is no current prospect of a flood defence being

delivered at this most vulnerable location. It is therefore essential that public funding is used to deliver the comprehensive flood defence solution. Flood defence at this location will give confidence to landowners and investors looking to bring forward the other development sites.

- 2.3.4 The proposed flood defence wall will run parallel to the A259 road along the northern boundary of the Sussex Yacht Club site at Shoreham. Based on the Environment Agency's Design Guidance a reinforced concrete core and foundation wall is considered to be the most technically viable solution. The proposed flood defence will tie in with existing flood defences to the west by continuing the structure into the higher ground at the Adur Ferry Bridge; and will join directly with the flood wall under construction at the Parcellforce site directly to the east.

Key Steps in the Project

Steps undertaken to date

- 2.3.5 The principal cause of delay for the Council in bringing the project forward has been the need for the Council to purchase land from Sussex Yacht Club adjacent to the A259 road on which to construct the flood defence wall. The Yacht Club's existing clubhouse building directly abuts that A259 road. The construction of the new flood wall will require the demolition of the clubhouse, and its replacement elsewhere on the site.
- 2.3.6 Given the sensitivity of the proposal to club members, and the sites location within a conservation area, the Council have spent considerable time in discussions with Sussex Yacht Club to ensure that there are strong relationships between the parties, and to ensure that the Yacht Club are willing to negotiate the sale of the land. The Council consider that while the delay to date has been regrettable, that this is significantly less time consuming and costly than acquiring the land through the compulsory purchase process. Sussex Yacht Club members agreed in principle to the proposed flood defence solution and sale of the land to the Council at a meeting on 03/09/2016.
- 2.3.7 The Council have prepared a design for the new flood wall, engaged with the yacht club on the terms of a sale, identified the potential costs of construction, including the demolition of the existing club house and garnered support for the project from key stakeholders and statutory consultees.

Key steps for delivering the project

- 2.3.8 Adur District Council is dependent on the Local Growth Fund allocation to purchase the land from Sussex Yacht Club and to construct the new flood defence wall. However, the Council were unable to commence negotiations as there was no clarity on the financial envelope available.
- 2.3.9 The critical path for the project is therefore essential to understanding this business case:
- 1) Agree with Sussex Yacht Club on the most suitable flood defence solution at the site for the club, and agree the principle of selling land to the Council on which to construct the flood defence solution.
 - 2) Agree a funding envelope for the purchase of the land and development of the flood defence wall with the Coast to Capital LEP (total allocated from all sources (£4.7m) – cost of new wall (£1.4m) = financial envelope for purchase of land (up to £3.3m) and agree this with Coast to Capital LEP (July/August 2016).

- 3) Present and agree the business case to the Environment Agency that justifies drawing down £1.2m funding allocated in The Department for Environment Food & Rural Affairs' "Flood and coastal erosion risk management (FECRM) Pipeline Programme – England" (2015). Agree with the Environment Agency to bring forward funding from 2019/20 & 2020/21 to 2017/18. (March/April 2017)
- 4) Negotiation and purchase of the land from Sussex Yacht Club using specialist surveying advice. (September 2017 - March 2017)
- 5) Procure of final (construction) design, build and monitoring main contractor for the full scheme including ground condition surveys. (April 2017 - September 2017)
- 6) Phased demolition and site preparation (September 2017 - November 2017)
- 7) Construction of new flood wall. (November 2017 - April 2018)

2.3.10 A more detailed breakdown of the steps and timescales is provided in section 4.3.

Objectives

2.3.10 The objective is to deliver a future proofed flood defence at Sussex Yacht Club that will be integrated with the wider flood defences along Western Harbour Arm by working in partnership with existing and future landowners, Environment Agency, West Sussex County Council and local business and residents.

Key Strategic Benefits

2.3.11 During the Local Plan period up to 2031, it is envisaged that the Harbour will deliver up to 1,450 new homes (1,050 along the Western Harbour Arm in Adur District and 400 in South Portslade and Aldrington Basin in Brighton and Hove).

2.3.12 The development sites along the Western Harbour Arm need confidence that a comprehensive flood defence scheme will be delivered and that there will be no flood risk on their sites. The delivery of flood defences on these sites will provide confidence to the adjoining landowners on the Western Harbour Arm that a comprehensive flood defence solution will be delivered, and enable them to invest with confidence.

2.3.13 The key strategic benefits of the proposals are in providing a flood defence at the current weakest point in the system, and enabling the delivery of the wider Western Harbour Arm strategic regeneration site which has the following strategic benefits:

- Approximately 21,500 sqm of employment floorspace (14,000 sqm in Adur District and 7,500 sqm in Brighton and Hove).
- Generation of 1,500 to 1,700 new full time jobs directly (between 620 and 870 net additional) and creation of 500 jobs at the Port.
- Support for 1,630 – 1,720 full time temporary construction jobs.
- Consolidation of Shoreham Port operations in the Eastern Arm and Canal and securing existing jobs at the Port Authority.
- Local environmental improvements to include upgraded flood defence network integrated with a riverside walk/cycle route, new and improved social and community facilities, marine/ leisure facilities and improvements to the local transport network.

2.3.14 The Greater Brighton City Deal sets out the key strategic benefit of the proposals succinctly:

“one key issue that is holding up the development of these Growth Centres – particularly at Newhaven and Shoreham – is the ongoing uncertainty around flood defences. Both of these sites are adjacent to the coast and to rivers, and face a significant risk of flooding. In the period of poor weather during December 2013 the River Adur burst its banks at Shoreham, causing severe flooding. Although the Environment Agency is developing schemes to reduce this flood risk, there is significant uncertainty about when the funding for these schemes can be secured. This uncertainty is putting off private sector investment and stalling the growth of these sites.

Through this City Deal, Government and Greater Brighton have agreed an arrangement that will enable local partners to guarantee the start dates for the required flood defence work, in return for local contributions to improve the value for money of the schemes (known as the “Partnership Funding” threshold). This agreement will enable private sector investment to be brought forward, and will protect homes and businesses and key transport infrastructure across the area, while improving the value for money of the flood defence work.” (Greater Brighton City Deal 2014, page 8)

Key Stakeholders and their roles and responsibilities

- 2.3.15 Due to the complexity of the two parts of the project there are a number of key internal and external stakeholders who must be involved throughout the detailed design, procurement and delivery stage.
- 2.3.16 Adur District Council – Local Planning Authority and Lead Agency for the development the Council is a key stakeholder. Responsible for leading the project, site assembly and purchase of the land, managing design and construction, and overall project management. A letter of support for the proposal has been received from Cllr Neil Parkin, Leader of Adur District Council (see appendix A). The Council’s Head of Development Management has provided a letter outlining the material considerations that will be evaluated when considering the scheme and has provided assurance that there is not likely to be an objection in principle to the scheme.
- 2.3.17 Sussex Yacht Club – as land owner of the site they are a key stakeholder. The yacht club have written to the Council supporting the proposal, and are a key partner at site assembly, design and build stages to ensure that the scheme is delivered with their full cooperation. Sussex Yacht Club’s letter of support for the proposal is attached as Appendix B.
- 2.3.18 Developers and landowners along the Western Harbour Arm - key developers and landowners including Southern Housing Group (Free Wharf Site), and BVG Development (former Parcelforce Site) both of whom have provided letters of support for the flood defence scheme provided at Appendix C.
- 2.3.19 Environment Agency - are responsible for delivering the flood defence scheme upstream of the Western Harbour Arm. They have been consulted in detail when the Council was preparing the Flood Risk Management Supplementary Planning document on which the proposed scheme is designed. The Council have engaged with the Environment Agency to ensure that the scheme offers a comprehensive solution which ties in with other flood

defences (both existing and proposed) in Shoreham. A letter of support is included at Appendix D

- 2.3.20 West Sussex County Council - the County Council will play a key role in ensuring that the footpath and cycle path proposals are properly designed and integrated with other pieces of public realm in the area. A letter of support is included at Appendix E.
- 2.3.21 Shoreham Port Authority - play a key role in ensuring that flood defence proposals are suitable and appropriate for the port and will not affect the operation of it as a commercial entity. Shoreham Port have indicated their support for the project at Appendix F.
- 2.3.22 The means through which the District Council as the lead organisation intend to engage and inform these stakeholders are set out in the Communications and Stakeholder Management Section at 6.3 below.

2.4 Strategic Options for Delivery

The Approved Flood and Coastal Risk Management Strategy

- 2.4.1 The strategic options for flood defences are considered in the Rivers Arun to Adur Flood and Erosion Management Strategy (the Strategy) which describes the 100-year plan for managing flood and erosion risk for a 32km tidal frontage in West Sussex, covering the lower tidal reaches of the Rivers Arun and Adur and the coastline in between. The Strategy area covers the stretch of urbanised coastline from the east bank of the River Arun in Littlehampton including the coastline moving east past Worthing to include both the east and west banks of the River Adur, downstream of the A27, in Shoreham-by-Sea (TQ 241 049).
- 2.4.2 The Strategy was developed by the Environment Agency in partnership with the other Operating Authorities; Arun District, Worthing Borough and Adur District Councils and was approved by the Environment Agency's Board in May 2009 and adopted by Defra in April 2010.
- 2.4.3 The Strategy area is divided into nine Operational Management Units (OMUs). The River Adur OMU 9 defends Shoreham-by-sea on the east bank of the Adur. OMU9 is further divided into 3 sub-units, 9i upstream to 9iii downstream, see Key Plan 1.

Strategy Recommendation

- 2.4.4 The Strategy preferred option for the Western Harbour Arm 9i is 'Phased Improve'. For the first 50 years it recommends raising of the walls along the river banks. For the next 50 years it recommends either the construction of a tidal barrier, or further raising of the defence height to maintain the standard of protection (SoP) up to year 100. This follows the adaptive approach to climate change recommended in the Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERM-AG).
- 2.4.5 The overall Flood and Coastal Risk Management strategy has therefore been considered in detail previously, and an approach has been established. This agreed approach is currently being implemented by the flood defence works for OMU 7 and OMU 8 and OMU9i upstream of the Western Harbour Arm and it is therefore considered that the strategic approach should be consistent with these.

2.5 Constraints

- 2.5.1 Site Location – the works will be delivered in a constrained urban location adjacent to a busy A class road with heavy traffic flows.
- 2.5.2 Land purchase agreement – the flood defence wall is dependent on the Sussex Yacht Club continuing to be willing to enter into negotiations with the Council for the purchase of the land to ensure that a compulsory purchase route is avoided.
- 2.5.3 Delivery – the proposed development will need to be delivered during a suitable window to minimise the disruption to the yacht club, but also minimising the likelihood of a flood event affecting the construction works.
- 2.5.4 Finance – the deliverability of the flood defence is contingent on the Council reaching negotiated agreement with Sussex Yacht Club on the value of the site.
- 2.5.5 Planning – the site is located within the Shoreham-by-Sea Conservation area and the proposed development will need to ensure that the development proposal will lead to “less than substantial harm” to the significance of the heritage asset.
- 2.5.6 Funding – the capital construction costs of delivering the new flood defence wall (and cost of replacement clubhouse for Sussex Yacht Club) continue to increase due to build cost inflation and further delays to the project will increase costs.

2.6 Initial Affordability Assessment

Cost of Flood Defence

- 2.6.1 Estimated construction costs of the flood defence solutions for the site are shown in Appendix H (Flood Defence Supplementary Planning Document Technical Annex) and summarised in Table 2-1 below. The Costs were calculated based on the following references:
 - Environment Agency. (2011). Long term costing tool (Cost estimation for fluvial defences)
 - Spons. (2014). Civil Engineering and Highway Works Price Book
 - Contractor priced estimates Costs were developed per linear metre with annual maintenance costs approximated as being 0.5% of the construction cost per year.
- 2.6.2 The costs of the various defence concepts also require an optimism bias to be applied. The Environment Agency’s FCERM appraisal guidance recommends an optimism bias of 60% for strategies and 30% for schemes in the absence of a more comprehensive analysis. On the basis of the level of design undertaken and the lack of information on ground conditions a 60% optimism bias has been applied.
- 2.6.3 Table 2-1 estimates that the costs of provision of the new flood defence are between £3,070 per metre and £14,112 per metre depending on the option selected. Based on a total length of 255 metres the total scheme cost therefore ranges from £782,850 to £3,598,560 depending on what flood defence solution is preferred.

- 2.6.4 The preferred solution “Flood Wall Set Back” is estimated to cost between 2,848 £/m and 5,380 £/m. The total cost of the flood defence wall based on a total length of 255 metres including a suitable optimism bias of 60% is £1,400,000.

Cost of Purchase of Land from Sussex Yacht Club

- 2.6.4 The proposed flood defence wall will be located on land owned currently by Sussex Yacht Club. As set out in section 2.3.9 above, the critical path requires Adur District Council to purchase this land from Sussex Yacht Club and the club have indicated that they are willing to make the land available subject to “an acceptable offer for the land and buildings is made”.
- 2.6.5 The proposed scheme will require the demolition of the existing clubhouse, a number of outbuildings and some storage sheds. Sussex Yacht Club have indicated that they will accept an offer that would allow them to develop a modern like-for-like replacement of these facilities on another part of their site.
- 2.6.6 The Council have received valuation advice from Northgates which estimates the cost of a like-for-like modern replacement of the existing clubhouse is likely to be in the region of £2,925,000 including contingency and professional advice. A letter explaining this cost plan is attached at Appendix G.
- 2.6.7 Advice from the District Valuer’s service has also indicated that there are other additional costs including loss of revenue, compensation and disturbance fees which Sussex Yacht Club will wish to recover which was estimated to total £300,000.

Sources of Funding

- 2.6.5 The Department for Environment Food & Rural Affairs’ “Flood and coastal erosion risk management (FECRM) Pipeline Programme – England” (2015) identifies funding of £1.2m as available to support flood defence projects along the Western Harbour Arm with identified draw down of funding in 2019/20 and 2020/21. This is confirmed in the Greater Brighton City Deal which states that the Environment Agency will ring fence the funds over the project period towards improved flood defences downstream of the new footbridge, subject to Greater Brighton and partners successfully securing gap funding of £10.8m
- 2.6.6 Local Growth Fund 2 identifies funding of £3,500,000 for Shoreham Flood Defences at Western Harbour Arm.
- 2.6.5 As set out in paragraph 1.3 and 2.3.3 it is not considered that there is any long term development potential on the sites that would deliver private investment in flood defences on this site.

Table 2-1 Comparative cost of options by frontage

Frontage	Option	Components	Cost Range		Cost Range including 60% optimism bias	
			Min (£/m)	Max (£/m)	Min (£/m)	Max (£/m)
Sussex Yacht Club Site	Concrete Blockwork Revetment	Revetment	781	3,423	1,250	5,477
		Backfill to support revetment	1,318	1,138	1,821	1,821
		TOTAL	1,919	4,561	3,070	7,298
	Flood wall, set back	Flood wall (height = 2.1 – 5.3m)	2,824	5,382	4,557	8,611
		TOTAL	2,848	5,382	4,557	8,611
	Flood wall, on existing defence	Flood wall (height = 2.1–5.3m)	2,848	5,382	4,557	8,611
		TOTAL	2,848	5,382	4,557	8,611
	Sheet piles in front of existing defence	Sheet piles	8,525	8,525	13,640	13,640
		Sacrificial anodes for sheet piles	295	295	472	472
		TOTAL	8820	8,820	14,112	14,112

2.7 Long Term Sustainability

2.7.1 The key considerations for long term sustainability are:

1. The cost of ensuring an on-going inspection and maintenance regime to ensure the asset is maintained. This will be maintained by Adur District Council as the riparian owner and will be met from their existing budget; and
2. As there is need for both pedestrian and vehicular access across the Sussex Yacht Club site and the adjacent hards (which are public rights of way and thus cannot be stopped up) there is a need for an emergency management procedure to ensure that in the event of a flood incident that flood gates are operated as planned.

2.7.2 Annual maintenance costs are approximated as being 0.5% of the construction cost per year. All new defences will require on-going maintenance throughout their life. Provision for future maintenance would be the responsibility of the developer or riparian owner. The maintenance requirements and provisions would need to be agreed with the local planning authority and in consultation with the Environment Agency and Shoreham Port Authority, prior to construction, and adequate funds set aside.

2.7.3 The design of defences will need to ensure safe access for inspection and maintenance. There will need to be agreed procedures for ensuring that when flooding was predicted that the undefended sections were closed in the interest of safety. The accessibility of the redevelopment to all users is paramount. To this end the provision of step free access is required throughout the development area and the alignment and positioning of the defences will need to make allowance for ramps where changes in level are envisaged. If access through a defence is required then any flood gates should be specified with accessibility in mind.

3 Economic Case and Option Appraisal

3.1 Development and appraisal of options

- 3.1.1 Adur District Council appointed consultants JMP to advise on the preparation of the Shoreham Harbour Flood Risk Management Guide SPD. The guide was prepared to ensure that there was clear guidance for developers on how to bring forward flood defences on development sites.
- 3.1.2 The Technical Annex accompanying this SPD involved the appraisal of options through identifying mitigation measures, the short listing of measures using multi-criteria analysis and the concept design and cost estimation of emerging favoured options. The section below sets out the Technical Annex's approach.

Identification of Options

- 3.1.3 A long list of options was determined by considering all possible flood defences for the Western Harbour Arm. These were then categorise and split into types and defence alignment (see table 3-1) below

Table 3-1

Category	Type	Alignment
Piling	Steel Sheet Piles	Maintain existing
		New – set forwards
		New – set backwards
	Concrete Piles	New – set forwards
		New – set backwards
	Plastic Piles	New – set forwards
		New – set backwards
	Timber Piles	New – set forwards
New – set backwards		
Revetments	Rock armour	As a defence line
	Concrete proprietary (Xbloc, tetrapod etc)	As a defence line
	Concrete blockwork (modular)	As a defence line
	Masonry blockwork (pitching)	As a defence line
	Timber	As a defence line
	Gabions	As a defence line
	Reinforced earth	As a defence line
	Self-supported	As a defence line
	Supported by a retaining flood wall	As a defence line
	Raised concrete revetment	As a defence line
Earth	As a defence line	
Flood Walls	Reinforced concrete	On top of existing defence line
		Set back from existing defence line
	Steel sheet piled	Set back from defence line – low depth piling, using existing piling to provide main defence
	Concrete piled	Set back from defence line – low depth piling, using existing piling to provide main defence
	Masonry	On top of existing defence
Set back from defence line – low		

		depth piling, using existing piling to provide main defence
Demountable defences	Flood gates	As a defence line
	Drop in defences	As a defence line
	Temporary flood walls (permanent columns)	As a defence line
	Other temporary defences	As a defence line
Flood Resilience	Property level protection	To protect individual property
	Elevated buildings	To protect individual property
Tidal barrier		As a defence line
Other	Shingle beach/ beach nourishment	
	Mud flats	
	Slipways	
	Hards	
	Inlets	

Initial Screening

3.1.4 An options matrix was created to enable consideration of the feasibility of each of the flood defence type, based on the following categories:

- applicability at each defence zone
- cost
- maintenance
- adaptability
- design life
- environmental impact and
- visual impact

3.1.5 The number of options in the long list was reduced by discounting options that were considered unfeasible, based on the criteria set out above. This short list can be seen in Table 3-2. The initial screening process was based on engineering judgement and not a consideration of the architectural opportunities. Materials and finishes are not integral to short listing design concepts. Finishes may change based on planning requirements to integrate flood defences into the overall redevelopment and meet the requirements of development in a conservation area.

Long Listed Options - Multi Criteria Analysis

3.1.6 The Technical Annex prepared by JBA employed Multi Criteria Analysis (MCA) as a means to sift through the long list of options. MCA is a qualitative approach to identify preferences amongst different options, was used to facilitate the options selection process and to enable the relative merits of defence options to be assessed. A short list of preferred options was then produced and taken forward for concept design.

3.1.7 A MCA has been completed to facilitate the options selection process; to enable the relative merits of defence options that had passed the initial screening to be assessed.

3.1.8 The categories considered within the MCA were developed based on the technical requirements of the appraisal. The four primary categories under which the options have been assessed are: technical, environmental and social; economic; and climate change adaptation. Within these, a number of sub categories (see Table 3-2) have been used for scoring purposes, with each defence option marked out of 5 for suitability and all assessment criteria weighted equally.

Table 3-2

Assessment Criteria	Technical	Design	Capable of providing standard of protection to required level
			Maximised protected area
			Design longevity – material properties
			Low land take requirements
			Protection of infrastructure
			Protection from wave energy
		Construction and maintenance	Design is simple to construct
			Future maintenance requirement is minimised
	Environmental and social	Public amenity	Low impact on public amenity (general)
			Low impact on recreational/commercial water users
		Natural Environment	No adverse impact on tidal habitat
			Capable of incorporation of additional habitat features that benefit flora and fauna
			Low impact of contaminated land
		Landscape and visual amenity	Minimise impact on landscape character and visual amenity of the local environment
			Public acceptability and potential for adverse public opinion
	Economic	Heritage	Minimise impact on fabric and setting of historic structures
		Cost	Low capital investment required
			Low maintenance costs
	Climate change adaptation		Design can be easily adapted to accommodate climate change impacts

		Design minimises carbon footprint during construction (concrete & steel usage and delivery)
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3.1.9 Detailed defences options, informed by the MCA were taken for to concept design stage shown in table 3-3

Table 3-3

Category	Type	Alignment
Piling	Steel sheet piles	New – set forward
Revetments	Concrete blockwork (modular)	As a defence line
Flood walls	Reinforced concrete	On top of existing defence line
		Set back from existing defence line

Decision tree

3.1.10 A JBA study then used a decision tree flow chart to guide decisions. This flow chart is used to aid choice selection and understanding of consequences. Decision trees can simplify interdependent processes and facilitate interpretation and communication.

3.1.11 The decision tree (see Appendix H) supports the prioritisation of defences based on certain site required attributes. These are as follows:

- Is the location being developed ahead of neighbouring sites?
- Does the location require additional protection from wave action?
- Is there the possibility that land use change occurs at the Yacht Club?
- Is the condition of the existing defence suitable for the lifetime of the proposed development?

3.1.12 Based on these questions it is possible to determine which type of defences should be preferred for any development frontage.

3.2 Short listed options

3.2.1 For a comprehensive defence solution the defence solution for the Sussex Yacht Club site must tie-in effectively with the flood defence solution on the adjacent Parcellforce site, and across the proposed infilled Tarmount Hard but also allow for access to the new stepped quay wall.

3.2.2 Future defences at the Sussex Yacht Club will need to tie in with the footbridge to the west and the redevelopment at the Parcellforce site to the east. There are three technically feasible alignments that a new defence could follow which are outlined in full in the Shoreham Harbour Flood Risk Management Guide Supplementary Planning Document Technical Annex (see document attached at Appendix H).

Option 1: Concrete Blockwork Revetment

3.2.3 Concrete blockwork revetments are commonly used in marine environments that are not exposed to excessive wave activity. Consequently, it is considered to be a suitable form of defence for the section fronting the Sussex Yacht Club. Under this option, the revetment would be constructed in front of the existing defence line. Land raising and backfill will be required to enable the integration of the defence into existing land and defences. The extent of land raising could be up to 2m in places based on existing levels unless it remained feasible for parts of the site to be below the defence level although this could complicate the integration of hards and slipways.

- 3.2.4 Construction of the revetment in front of the existing defence though will encroach, potentially significantly, into the river channel. Approval from the Environment Agency will be required before construction can occur and it is likely that compensatory inter-tidal habitat will be required to be provided elsewhere. Land take is not an issue with this option if the defence is extended outwards from the land. However, to mitigate river encroachment and loss of inter-tidal habitat, the existing defence may need to be removed and the new revetment set along the original defence line. If this were to occur then there would be a considerable loss of site land area.
- 3.2.5 As with all of the other riverside defences the revetment would need to be tied in to the abutments of the Adur Ferry Bridge and/or Dolphin Hard to ensure closure of the flood cell. This would entail building the defence as close to the tie-in point and infilling with a suitable material to form a joint. The revetment would also need to tie in a similar manner with the proposed stepped quay at Tarmount Hard.

Option 2: Flood Wall, set back

- 3.2.6 Flood walls would enable a raising of the existing defence level and minimal change to the nature and use of the existing site. It is assumed that existing flood defence structures will remain in place. Under this option a flood wall would be constructed to the rear of the existing defence line; protecting the A259 and communities behind but allowing some riverside inundation during flood events.
- 3.2.7 The existing land use for boating related activities at the Sussex Yacht Club site is considered to be compatible, although the defence line might need to be amended locally to ensure the clubhouse was protected. A change of land use and land use vulnerability is likely to be restricted in these circumstances.
- 3.2.8 The precise location of a set back flood wall was not determined at options stage but assumed to be largely to the rear of the site adjacent to the A259. However this option is technically simpler to implement and is expected to be cheaper than the others to construct. There is the risk that a wall which could be up to 1.5m high would significantly alter the relationship between the site and the A259. If the option were to be progressed these concerns should be further explored through consultation and detailed design.
- 3.2.9 Based on the EA Design Guidance a reinforced concrete core and foundation wall is considered as the most technically viable solution. The wall foundation includes a shear key (a downward extension of a portion of the foundation) to improve sliding resistance (lateral movement of the wall when loaded e.g. under flood conditions) and also increase the flow path for potential flood water which will help minimise seepage of floodwater through the ground underneath the defence. It is envisaged that the wall will be clad with either bricks or stone, dependent on the local planning authority requirements and architectural master plan. The tie-in with existing defences is much simpler for this option as the flood wall can tie into the higher ground at the Adur Ferry

Option 3: Sheet piles, in front of existing defence

- 3.2.10 A new sheet pile wall may facilitate the expansion and improvement of the existing yachting and boatyard facilities. The steel sheet pile wall will be constructed in front of the existing defence line under this option. Whilst it is possible to pile behind the defence line, it is also substantially more expensive. This is largely due to the number of risks which can arise. These include:
- The presence of services (often surface water sewer outfalls) which might need to be diverted
 - Backfill behind the original defence not providing suitable material to drive piles through
 - Issues in mobilising contaminated land

- 3.2.11 Local backfill will be required to enable the integration of the defence into the existing defence line. This option may create additional usable land above the flood level where the existing sloping defence can be replaced by a vertical defence. The sheet pile wall could facilitate the creation of floating pontoons which could have gangway access from the top of the defence which could not be achieved with sloped revetment type defences. Alternatively the sheet piling can be designed to allow the integration of stepped quays or hards. Consequently, this would give more boat storage space on the water and combined with the additional usable land could enable expansion of the yachting activities.
- 3.2.12 By bringing the defence line forward, approval from the Environment Agency will be required before construction can occur and it is likely that compensatory intertidal habitat will be required to be provided elsewhere.
- 3.2.13 A tie-in between the pile cap and the proposed Parcelforce site flood wall would be required. If the detailed assessment of the pile condition at the Parcelforce site requires they be replaced it would be more cost effective to construct a continuous line of sheet piles along the entire frontage. These could then be joined to the existing pile wall along the Riverside Business Centre to Kingston Beach frontage.

3.3 Cost benefit analysis

Affordability

- 3.3.2 The funding available for all of the shortlisted options are listed in table 3-4 below.

Table 3-4

	16/17 (£ '000)	17/18 (£ '000)	18/19 (£ '000)	19/20 (£ '000)	20/21 (£ '000)	Total
LGF	3,500,000					3,500,000
DEFRA Environment Agency Funding				600	600	1,200,000
Total						4,700,000

- 3.3.3 The LEP should note that the DEFRA/Environment Agency funding is identified in current plans for draw down in 2019/20 and 2020/21. The Council have held initial discussions with the Environment Agency about how to bring forward this funding to enable the present scheme. They are aware that continued delay of the project may result in the Coast to Capital LEP reprioritising the funding for other projects in the LEP area. Therefore, in the interests of ensuring the project is delivered they are willing to prioritise the funding in 2017/18 and 2018/19.

3.3.4 Cost of the Options

Table 3 -5

Option	Cost of Land assembly	Cost of Flood Defence Wall (including	Comment on Costs

		optimism bias -see table 2-1)	
Option 1 Concrete Blockwork Revetment	Unknown as Yacht Club not in favour of proposal.	£1,824,500	Sussex Yacht Club have indicated that they are unwilling to sell any land for flood defences that would sever their boatyard from the river as it would hinder thier activities. The Council would need to acquire the land through Compulsory Purchase Order.
Option 2 Flood Wall, set back	£3,000,000	£1,470,000*	This option presents a clear costed option which we can be delivered with confidence. It avoids a compulsor purchase procedure, and can be delivered in the short term.
Option 3 Sheet piles, in front of existing defence	Unknown as Yacht Club not in favour of proposal.	£3,528,000	Sussex Yacht Club have indicated that they are unwilling to sell any land for flood defences that would sever their boatyard from the river as it would hinder thier activities. The Council would need to acquire the land through Compulsory Purchase Order.

* Cost estimate received from JBA consultants July 2017.

3.3.5 Benefits

Table 3-6

Option	Benefits
Option 1 Concrete Blockwork Revetment	Will provide a suitable flood defence that will protect existing and future properties. Proposal would not require any actions or activities to seal the flood defence as would be the case in a flod wall set back (flood gates would need to be secured). No impact on character of the Conservation Area.
Option 2 Flood Wall, set back	Will provide a suitable flood defence that will protect existing and future properties. Technically the easiest to integrate with flood protection to the east and west of the site and won't require any compensatory habitat to meet birds direction.

	<p>Option can be easily delivered with the requirement for compulsory purchase of land from Sussex Yacht Club.</p> <p>Will not hamper the operation of the yacht club by</p>
<p>Option 3 Sheet piles, in front of existing defence</p>	<p>Will provide a suitable flood defence that will protect existing and future properties.</p> <p>Proposal would not require any actions or activities to seal the flood defence as would be the case in a flood wall set back (flood gates would need to be secured).</p> <p>No impact on character of the Conservation Area.</p>

3.3.6 Risk

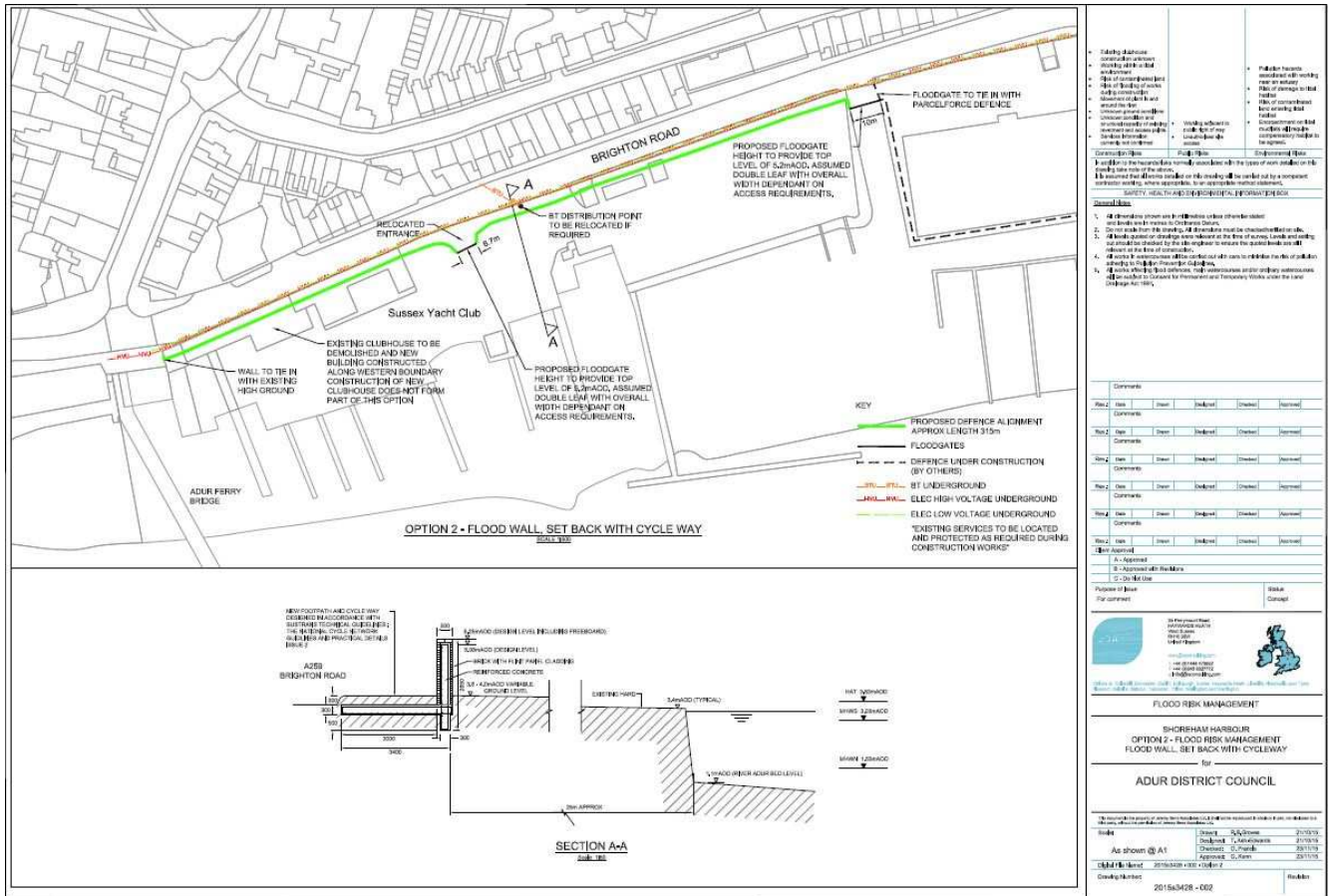
TABLE 3-7

Shortlisted Option	Risks	Impact	Likelihood	Mitigations	Costs
Option 1 Concrete Blockwork Revetment	Yacht Club refuse to make available the land as it will restrict their operations and access for crafts to the river..	High	High	Purchase the land through compulsory purchase	
	Unable to identify a suitable site for compensatory inter tidal habitat.	High	Medium	None	
Option 2 Flood Wall, set back	Yacht Club refuse to make available the land as it will require demolition of their existing clubhouse.	High	Low	Purchase the land through compulsory purchase	<p>Significant cost implications due to delay.</p> <p>Potential for funding to be withdrawn.</p>
	New wall refused planning application due to impact on Conservation Area	Low	Medium	Revise scheme and design of wall to ensure acceptability to planning committee.	£3,000 for revised drawings.

Option 3 Sheet piles, in front of existing defence	Yacht Club refuse to make available the land as it will restrict their operation and access for crafts to the river.	High	High	Purchase the land through compulsory purchase	
	Unable to identify a suitable site for compensatory inter tidal habitat.	High	Medium	None	

3.4 Recommendations and preferred option

- 3.4.1 The Council commissioned JBA Consulting to review the Technical Annex to the Western Harbour Arm Flood Risk Management Guide SPD and to re-consider the preferred options for protecting the Sussex Yacht Club site. The addendum report is included below at Appendix I
- 3.4.2 The Addendum report identifies that Option 2 Flood wall, set back should be considered the preferred option as it scores slightly higher than the sheet piled quay wall. It highlights the main advantages are its cheaper cost, ease of maintenance, and enhancement of public amenity through inclusion of the cycleway.
- 3.4.3 It is recommended that option 2 is followed up as this has the lowest degree of risk, will be acceptable to Sussex Yacht Club, and is the most achievable means to reduce the flood risk at this location to 120 homes, the commercial centre of Shoreham, and the A259 road.
- 3.4.4 The proposed layout plans for the flood defence wall are shown below:



4.0 Delivery

4.1 Project management arrangements

4.1.1 Adur District Council will manage the project on behalf of the partners. It will be the Lead Delivery partner and will manage the project board to oversee the construction of the flood defence wall. The full project management arrangements are set out in Section 6 below.

4.1.2 The Council will oversee the management of the project from an Accountable Body perspective. For the projects a programme board will have overall oversight of developments such as:

- Undertake necessary due diligence
- Delivery of acquisition and site preparation
- Prepare and submit claims/reports to Coast to Capital LEP
- Ensure the works are completed in a timely manner and all comply with conditions of the grant
- Take action if underperformance exists
- Ensure project contributes to the wider Coast to Capital LEP area and promote successes
- Ensure project connects with other Adur & Worthing Councils/LEP programmes
- Manage overarching performance for the entirety of the project

- 4.1.3 The Council has a specific project management approach that adapts itself to the need of various projects. For both developments, a range of officers have and will provide expert advice for legal, financial, planning and regeneration issues.
- 4.1.4 Furthermore, elected Members have been kept informed of project developments via one-to-one briefings (for those that have a regeneration lead), consultation events and through the Council's Major Projects Board. Due to the significance of this scheme, a dedicated Project Manager has been recruited to oversee the project and play a facilitating role between relevant officers and members and organise Partner Meetings where appropriate. The Project Manager reports directly into the Head of Economic Growth who also attends progress meetings when feasible; this person will lead the project from inception into the implementation phase and see the project through to completion.
- 4.1.5 Adur & Worthing Council's Major Projects team will:
- Obtain up to date, professional, commercial valuations for both land titles to aid Development Agreement negotiations
 - Obtain a Title Report and carry out legal due diligence
 - Seek joint Planning Application with the developer
 - Employ experienced cost consultant to ensure an equitable deal structure
 - Carry out legal due diligence on developer status
 - Carry out site investigations in partnership with the developer
 - Carry out regular risk reviews in partnership with the developer to ensure risks are allocated appropriately
- 4.1.6 The build contracts will be managed by the jointly appointed contractor, overseen by the Council and the developer, and they will employ a project manager to ensure the project delivers against the key milestones. Progress meetings will be established between the Council and the confirmed contractor on a monthly basis to monitor the construction phase.
- 4.1.7 The Council will monitor progress and apply appropriate financial controls and checks to ensure efficient drawdown of funds.
- 4.1.8 Officers will report progress, funding profiles, risks and deliverability to the Worthing Major Projects Board who will in turn report progress to the Adur & Worthing Joint Strategic Committee. Progress will also be reported to the Accountable Body, Greater Brighton Economic Board, Three Southern Counties Board and the Coast to Capital LEP.

4.2 Procurement Strategy

- 4.2.1 The high level design work to date has been undertaken by JBA consulting to inform the Council's adopted Flood Risk Management Supplementary Planning Document.
- 4.2.2 Procurement of the consultant team and contractor will be from one of the Council's existing Framework Agreements (such as iESE), which will provide the Council with OJEU compliant appointments (as they have already been pre-tendered). Appointments from established Framework Agreements can be made in a much shorter timescale than having to undertake a full OJEU process. Use of this procurement route is reflected in the timescales detailed below.
- 4.2.3 The appointment of the building contractor will also be a significant factor in successfully delivering the project. The Council has determined that the construction contract should be subject to a competitive tender process in accordance with EU guidelines. A market engagement process will be undertaken to encourage responses to the tender invitation. A two Stage Design and Building contract will be adopted, with novation of the design team.

4.3 Implementation Timescales

Table 4-1

Western Harbour Arm LGF - Project programme

Financial Year	2016/17											2017/18											2018/19											
	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December			
Undertake commercial valuation for site, taking into account condition, marketing and demand																																		
Define the detailed project programme for delivery																																		
Carry out regular risk reviews with updated risk register																																		
Carry out legal due diligence																																		
Early engagement with Statutory Bodies (WSCC, County Council Highways, EA, Natural England, Port Authority, ADC)																																		
Submission of Business Case to LEP																																		
Detailed site investigations assessing extent of any remediation required or service upgrades																																		
Structural Surveys to determine asbestos removal and																																		
Purchase negotiations (Formal offer to Yacht Club AGM 3rd																																		
District Valuer response received																																		
LGF Funding confirmed by LEP Board																																		
Ongoing management and maintenance negotiations with																																		
Employ cost consultant to ensure value for money over project																																		
Preparation of Business Case to Environment Agency																																		
Confirmation of funding from Environment Agency																																		
Formal agreement from WSCC on scheme and ongoing																																		
Yacht Club purchase agreed																																		
Planning and Conservation Area Applications preparation (JBA finalise drawings for submission)																																		
Applications submitted to LPA																																		
Planning Application - consideration by LPA and consultation with Statutory Bodies (Environment Agency, Natural England,																																		
Tender demolition, enabling works through a competitive process to be assessed by the cost consultant																																		
Tender Design and Build contract																																		
Planning Approval granted																																		
Partial draw down of Growth Deal funding (£3,144,375)																																		
Contract for demolition, enabling works and build agreed																																		
Quarterly feedback to LEP on project progress and spend																																		
Demolition Works																																		
Partial draw down of Growth Deal funds (£208,000)																																		
Partial draw down of Environment Agency funds (£600,000)																																		
Construction of new Flood Defence solution and																																		
End of financial year report to LEP																																		
Practical Completion																																		
Final draw down of Growth Deal funds (£147,625)																																		
Final draw down of Environment Agency funds (£600,000)																																		

4.4 Contract Management Approach

- 4.4.1 Adur & Worthing Borough Council has an agile approach to project management that adapts itself to the needs of the project. With regard to the flood defence scheme a range of officers have provided specialist advice in relation to legal, financial, planning and flood defence issues. Key Councillors are informed of issues through member briefings and at the Adur Major Projects Board, with key decisions made through individual cabinet member decisions and Joint Strategic Committee as appropriate.
- 4.4.2 A Project Manager within the Economic Growth directorate provides a facilitating role and point of contact between the relevant officers and members in the council, setting up project meetings as and when necessary and attending project meetings of the wider team and with appointed consultants and contractors. The build contract will be managed by the Council's project manager with support from cost consultants and legal and procurement. Through regular meetings and updates from the main contractor the Council will monitor progress on the project and apply appropriate financial controls in respect of the drawdown of the Local Growth Fund Grant.

5. Financial Case - the cost to the public purse, and budgeting

5.1 Budget Profile

Table 5-1 Funding of Project Cost

	2016/17 £	2017/18 £	2018/19 £	Total £
Capital Costs (including attributable development costs)	0	3,924,375	715,000	4,639,375
Construction/ Build Cost Inflation at 4.0%	0	28,000	32,625	60,625
Total Costs	0	3,952,375	747,625	4,700,000

Table 5-2 Funding Draw Down (Annual)

	2016/17 £	2017/18 £	2018/19 £	Total £
Local Growth Fund	0	3,352,375	147,625	3,500,000
Flood and Coastal Risk Management grant funding	0	600,000	600,000	1,200,000
Total	0	3,952,375	747,625	4,700,000

Table 5–2(A) Funding Draw Down (Quarterly)

	2016/17 £			2017/18 £				2018/19 £				Total £
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Local Growth Fund	0	0	0	3,144,375	0	0	208,000	0	0	147,625	0	3,500,000
Flood & Coastal Risk Management Grant Fund	0	0	0	0	0	0	600,000	0	0	600,000	0	1,200,000
Total	0	0	0	3,144,375	0	0	808,000	0	0	747,625	0	4,700,000

Table 5-3 Detailed Spend Profile

	2016/17 £	2017/18 £	2018/19 £	Total £
Attributable Development Costs*	0	80,000	15,000	95,000
Purchase of Land and Compensation @ 7.5%	0	3,144,375	0	3,144,375
Construction of flood defence wall**	0	700,000	700,000	1,400,000
Construction/ Build Cost Inflation at 4.0%	0	28,000	32,625	60,625
Total	0	3,952,375	747,625	4,700,000

*Fees include site investigations, surveys, site supervision, planning, flood risk consultancy advice, and structural engineering costs.

** See JBA Report in Appendix G for detailed breakdown of construction cost for the flood defence wall, footway and cycle path.

5.1.1 The costs associated in the above tables exclude the £3,750,000 private sector contribution from the immediate landowners to the east of the Sussex Yacht Club site; this includes WN Developments adjacent to the Sussex Yacht Club (old Parcellforce site) and Southern Housing who are adjacent to the aforementioned. All schemes will begin the process of creating a comprehensive flood defence solution along the full boundary of the Western Harbour Arm.

5.2 Budget Arrangements

- 5.2.1 The project's budget and funding drawn down will be managed by the Adur District Council who will act as the accountable body for the purposes of the flood defence scheme. A dedicated budget code will be prepared and the Council's regular financial management and monitoring procedures (which are in line with International Accounting Standards) will be applied to ensure that it is appropriately monitored and managed.
- 5.2.2 The Council's most recent Annual Audit Letter has confirmed that the District Council's financial management processes are suitable, appropriate and sufficient offering unqualified audit opinions in respect of compliance with International Standards on Auditing, value for money, and governance.

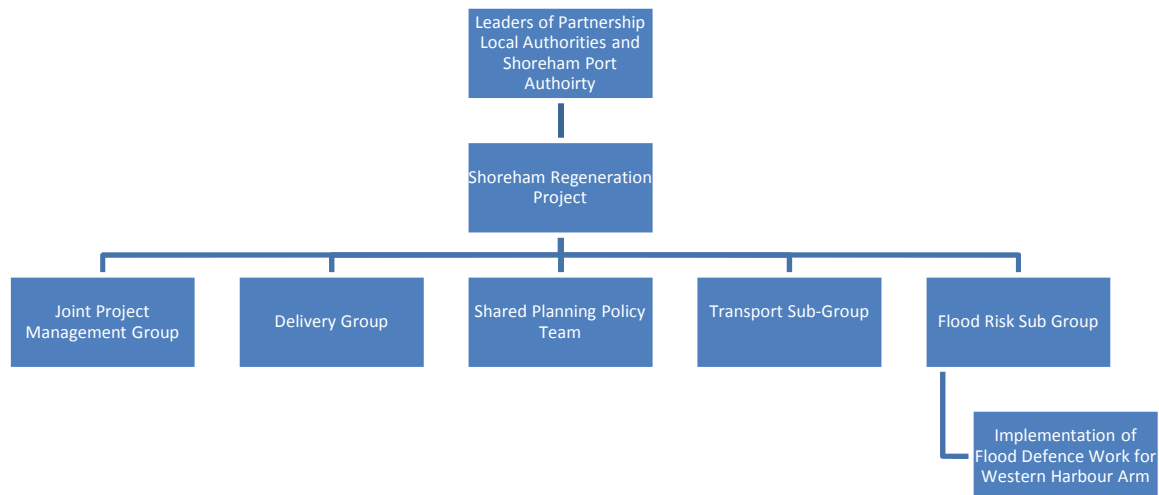
6. Management Case

6.1 Dependencies

- 6.1.1 There are a number of dependencies in delivering the project. Failure to deliver these are the key risks. They include:
- **Sussex Yacht Club Agreement to Sell** – The proposed flood defence solution requires either an agreement from Sussex Yacht Club to sell a strip of land to Adur District Council, or the District Council acquiring the land by compulsory purchase. The requirement to compulsorily purchase the land would exacerbate the build cost inflation risk set out below.
 - **Timetable** - if the project is delayed excessively then it is at risk of losing funding from key partners. The Environment Agencies funding of £1.2m could be removed if the project is not deliverable within the timescales set out in the initial bid.
 - **General Dependencies** - As stated above in section the Sussex Yacht Club site are considered to have negligent development potential due to the existing uses of the sites, and high ecological importance. Therefore, the delivery of new homes and employment floor space is dependent on the timely development of the other value generating sites along the Western Harbour Arm.
 - **Build cost inflation** is a risk and the longer the commencement of construction is delayed, the greater exposure to that risk. It is essential that the most financially viable scheme is secured in order for the build contract can be agreed with the contractor. Further exposure to build cost inflation will impact on viability and make the scheme undeliverable within the financial envelope available from the Local Growth Fund and LEP.
- 6.1.2 All of these risks and dependencies can be managed by ensuring that we have a scheme that is both viable and acceptable in planning terms, and ensuring that there is confidence about the viability at an early stage. A successful bid for funding will enable the scheme to proceed and remove significant risks.

6.2 Project Governance, Organisation Structure and Roles

- 6.2.1 The project will be governed as part of the well-established governance arrangements in place for the wider Shoreham Harbour Regeneration Project. The Flood Defences for Western Harbour arm will be governed primarily by the Flood Risk Sub Group, reporting to the Project Board, and Leaders Board. The governance structure is set out in the diagram below:



6.2.2 The Council manages a wide portfolio of projects using ‘Managing Successful Programmes’ (MSP) and PRINCE2 methodology as a framework. Portfolios of projects are co-ordinated into an investment programme which is overseen by the Adur Major Projects Board comprising the Executive Member for Regeneration, key local members, the Council’s Chief Executive, Director for Economy, and Head of Growth. The project will also report to the Shoreham Harbour Regeneration Project Board which includes representatives of key partners including West Sussex County Council, Shoreham Port Authority, and the Environment Agency.

6.2.3 Furthermore, at a strategic level, the Greater Brighton Investment Programme is overseen by the Greater Brighton Economic Board. A consistent highlighting reporting process has been agreed with the Greater Brighton Economic Board and C2C LEP Board to provide regular assurance around delivering and management of risk.

6.3 Communications and Stakeholder Management

6.3.1 Communications overview

6.3.2 Development along the Western Harbour Arm is a high profile economic and regeneration project. The communications for this project will need to be carefully managed to ensure that the amount of positive publicity locally, national, and internationally is maximised.

6.3.2 The project will be promoted in the context of the wider strategic regeneration programme using the – Shoreham Harbour / Greater Brighton branding with due reference to Coast to Capital LEP as a consistent message to promote transformation and regeneration of Shoreham, Adur and Greater Brighton City Region.

6.3.3 Below we outline the key times when communication will need to be planned. The project delivery team will work with Adur District Council / LEP communications teams in advance of these dates. The communications from any ad-hoc events that arise will be managed by direct liaison between the project team and the LEP communications teams.

6.3.4 The Adur District Council communications team has been briefed on the project and through officer working groups will remain updated on the project’s progress. The communications business partner for Economic Growth directorate will also make relevant links with communications activity for other jobs and growth activity and be the

principle officer responsible for liaising with Coast to Capital regarding communication and publicity activity.

- 6.3.5 The Leader of Adur District Council and both the Executive Member for Regeneration, and Chair of the Planning Committee will be kept informed on all significant project developments and communications via the Adur Major Projects Board and Leader and Executive member briefings.

Communications Key Messages

- 6.3.6 Key messages to be promoted in all communications throughout the project should include:
- Building on Shoreham’s success as a place to live, work and visit.
 - Unlocking key development sites along the Western Harbour arm
 - Delivery on addressing a key infrastructure weakness within Shoreham by developing new flood defences.
 - Key development in regenerating Shoreham
 - Helping to deliver growth highlighted in the Shoreham Harbour Joint Area Action Plan, and the Coast to Capital Strategic Economic Plan in one of the key opportunity areas in the plan.
 - Creating the conditions for X no jobs and X no new homes
 - An opportunity unlocked by the Greater Brighton City Deal and Coast to Capital Local Growth Fund.

Communications Key Events

Table 6-1 Communications Key Events

Event	Estimate Dates	Key Issues
Prior to Development	Autumn 2016 - Summer 2017	Highlight the scheme to a national and local audience to attract interest and investment in the sites that currently do not have a developer partner identified.
Enabling Works Start and Demolition on site	Summer 2017	Start on site should be highly publicised. Digging ceremony, photo opportunities, press releases etc with District Council, Environment Agency, Contractor, Sussex Yacht Club, and Coast to Capital reps leading. To be arranged by comms team in conjunction with contractors/partners. Also branded hoardings to be erected in feasible, in line with other LEP funded projects.
Signed contracts	Summer 2017	If project progresses in line with the project programme then this project will be a “good news” story for sharing with partners.
During Construction	December 2017 – Julun 2018	Press releases and images to be released during construction to keep profile of the project high plus regular update in the Shoreham Herald, on social media and council website etc.
Completion of	July 2018	Major launch party for completion ceremony. Photo opportunities, press releases. This will be a major

flood defences		communications exercise to achieve as much local and national press coverage as possible and linked to jobs and growth messages.
Flood Defences 1 st Anniversary	Summer 2019	Potential anniversary event tied into what other development or construction works are underway as a result of the flood defences.

6.4 Project Reporting

- 6.4.1 Established systems of reporting will operate as detailed above in section 6.2. The project manager organises and coordinates a Project Group to manage the implementation of the project which ties in with the . The project manager is held to account through regular meetings with the Head of Growth and Director for the Economy.
- 6.4.2 The Adur Major Projects Board and Shoreham Regeneration Partnership will oversee the project at a strategic level and the project manager will update the Project Board at the bi-monthly meetings.

6.5 Key Issues for Implementation

- 6.5.1 Key issues have been identified as part of this Business Case and through the risk management strategy. The headline key issue is that the Council need to understand what financial envelope is available before they can negotiate the purchase of the land from Sussex Yacht Club. This business case and response from C2C will establish that and allow the project to move forward.
- 6.5.2 The Council is in a position to rapidly implement the development of the flood defence wall once this has been resolved. .

6.6 Risk Management Strategy

- 6.6.1 The Council has an established system of risk management. Reporting arrangements are implemented to ensure early identification of development planning, cost and programme issues. Management structures are in place to ensure a rapid response to identified issues. Communication systems are in place to provide feedback and ensure partners are up to speed on key risks and the actions being undertaken to manage them.

6.7 Project Evaluation

- 6.7.1 The project is being constantly evaluated prior to build stage. The Project Manager keeps a log of the targets and deliverables during the project and tracks whether the targets are being met. This allows for constant evaluation of progress against the programme.
- 6.7.2 As an enabling project the key evaluation criteria amounts to whether a successful flood defence wall is constructed within the timescales suggested, and whether this provides sufficient confidence for private sector development to proceed along other sites in the Western Harbour Arm.