

Public Document Pack

JOHN WARD
Director of Corporate Services

Contact: Democratic Services
Email: democraticservices@chichester.gov.uk

East Pallant House
1 East Pallant
Chichester
West Sussex
PO19 1TY
Tel: 01243 785166
www.chichester.gov.uk



A meeting of the **Cabinet** will be held in Virtual on **Tuesday 2 March 2021** at **9.30 am**

MEMBERS: Mrs E Lintill (Chairman), Mrs S Taylor (Vice-Chairman), Mr R Briscoe, Mr A Dignum, Mrs P Plant, Mr A Sutton and Mr P Wilding

SUPPLEMENT TO AGENDA

5 **Beach Management Plan 2021-2026** (Pages 1 - 24)

Background Paper – online only.

This page is intentionally left blank

Short Form
Business Case
with guidance



Environment
Agency

for a FCERM change project for Local
Authorities, Internal Drainage Boards
and other risk management authorities

[\[Link to GOV.UK Flood and coastal defence: develop a project business case\]](#)

This business case template should be used for justifying schemes where the total scheme cost is less than £2 million.

For a flood risk scheme, send us your business case with a completed FCERM 2.

For a coastal scheme, send us your business case with a completed CPA1 and include a copy with a completed CPA2.

The procedures when applying for grant are set out in the Grant Memorandum and you should follow them to make sure that the total cost for approval is eligible for a grant. Once the scheme is approved you are eligible for a grant for the cost you have incurred in preparing your business case. This cost should be included in your application.

Exclude the cost of studies if you have previously claimed grant under a separate FCERM7. The whole life cost includes all development and study costs.

The business case describes your application for Flood and Coastal Erosion Risk Grant in Aid (FCERMGiA). It should contain all relevant evidence to satisfy a reader with no knowledge of the scheme that in technical, environmental and economic terms, your recommended investment decision is correct and deserves public investment.

We have provided this template with advice to help you compile your business case. Within the headings you can vary the content and material you wish to include. Include supporting information in appendices.

The template contains guidance notes. Please delete them from the completed the business case.

Contact your local Environment Agency Area Flood and Coastal Risk Manager and Partnership & Strategic Overview teams. They can provide advice and support you to prepare your business case.

Lead Authority:

Chichester District Council

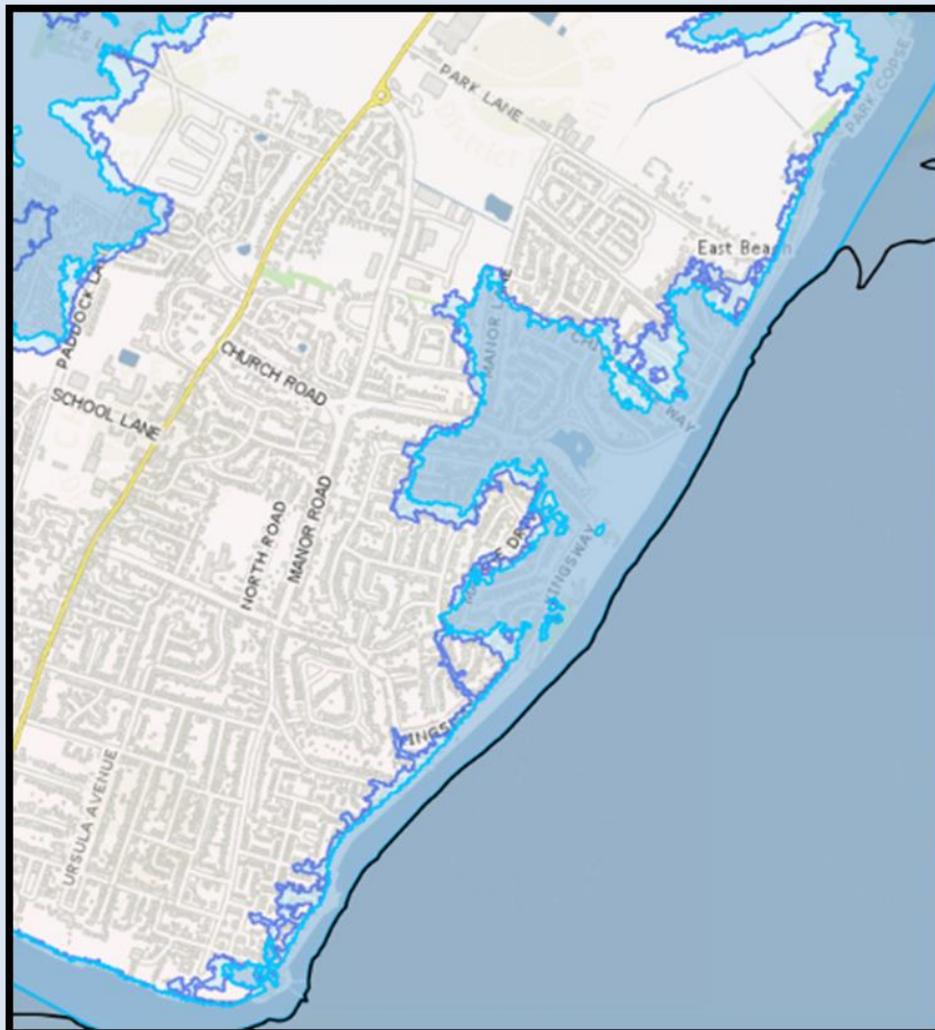


Project Title:

Selsey & Wittering Beach Management Plan 2021-26 Short Form Business Case

Version 4

Date 10.09.2020



BUSINESS CASE APPROVAL SHEET

1 Review & Technical Approval			
Project title	Selsey & Wittering Beach Management Plan 2021-26		
Authority project reference	SOC501E/000A/039A	EA reference	
Lead authority	Chichester District Council	Date of submission	17/09/2020
Consultant	Royal Haskoning DHV		
<p>'I confirm that this project meets our quality assurance requirements, environmental obligations and Defra investment appraisal conditions, that all internal approvals, including member approval, have been completed and recommend we apply to the Environment Agency for capital grant and local levy in the sum of £1.25m.'</p>			
Job title	Name	Signature	Date
Authority Project Executive	Alison Stevens		17 Sept 20
<p>'I have reviewed this document and confirm that it meets the current business case guidelines for local authority and Internal Drainage Board applications.'</p>			
OBC reviewer			
<p>'I confirm that the project is ready for assurance and that I have consulted with the Director of Business Finance.'</p>			
Area Flood & Coastal Risk Manager			
Assurance sign off - (Tick the appropriate box)			
AFCRM Assurance <input type="checkbox"/> Projects < £500k Or Projects < £1m (if GiA & Levy <£500k)		NPAS Assurance <input checked="" type="checkbox"/> Projects £500k - £2m	
Recommendation for approval			Date
AFCRM or NPAS Chair			
Project total as approved (£k)		Version Number	
Project total made up of:	Capital Grant (£k)		
	Levy (£k)		
	Other Contributions (£k)		

2 Project Financial approval				
Financial scheme of approval	Project total	Name	Signature	Date
Area Flood & Coastal Risk Manager	<£100k or <£1m (if GiA & Levy <£100k)			
Director of Business Finance	All projects >£100k			
Plus:				
Area Director	£100k-£1m			
Director of Operations	£1m -£10m			
3 Further approvals (if applicable)				
Date sent (or N/A)			Version number (if different)	
Date approved (or N/A)				
Final Comments				

For FSoD Coordinator use only:

Business Case

Approval Requested

Chichester District Council, as the local Coast Protection Authority, has undertaken beach management on the Selsey, Bracklesham & East Wittering frontages, in five year phases, for the past ten years. This approach is in direct accordance with the approved Pagham to East Head Coastal Defence Strategy and delivers the Shoreline Management Plan policy for these frontages (“Hold the Line”).

Our proposal is to extend the project for a further five years, as this will enable us to continue to protect 448 properties from flooding and prevent the loss of 78 properties due to coastal erosion.

The project will address the problem of naturally depleting beaches that are exposing aging coastal defences with limited ‘design life’ remaining. The failure of these coastal defences would lead to both the ‘inundation flooding’ of properties and property loss due to ‘coastal erosion’.

The amount of Flood and Coastal Erosion Risk Management Grant in Aid (FCERM GiA) funding being sought is £1,250,000.00 (This figure is inclusive of contingency funding).

The project’s geographical setting is on the South Coast of England, within the Chichester District, between Selsey and East Wittering (see Figures 1 and 2 below). Selsey and East Wittering are both densely populated communities. The two frontages were grouped into the same Beach Management Plan (BMP), to drive efficiencies and avoid the high costs of planning the management of each frontage separately.

Prior to the construction of the existing sea wall in the 1950’s Selsey had one of the fastest eroding coastlines in England. According to Sussex University, in the early 1900’s it was calculated that the coastline was receding at 2 to 3 metres per year.



Figure 1: Locations of works, large scale.

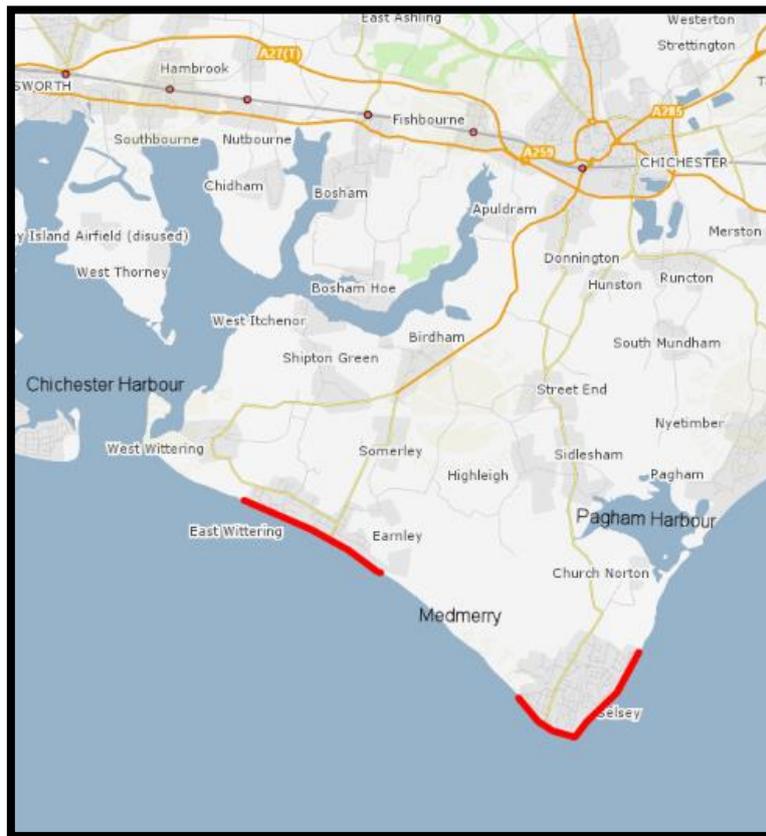


Figure 2: Detailed Location Plan.

1. Strategic case

1.1 The Problem

The Manhood Peninsula juts out southward into the Solent. It lies between the entrance to Chichester Harbour (to the West) and the entrance to Pagham Harbour (to the East).

The beaches around the peninsula, particularly those near the town of Selsey, are subjected to significant erosion forces. According to the regional beach management plan *“Selsey Bill is an erosive peninsula which is losing approximately 8,000m³ of shingle to Pagham Harbour every year. This supports the historic erosive trends with little to no influx of material.”* In the past, due to the rapid coastal erosion in the Selsey area, hard engineered defences were created to protect Selsey from both tidal flooding and erosion. These defences, constructed soon after the introduction of the 1949 Coast Protection Act, consisted of a reinforced concrete sea wall, complimented by wooden groyne and breastwork structures.

The concrete sea wall in Selsey and the timber breastwork in East Wittering have reached (or are close to reaching) the end of their ‘design lives’. Therefore, to protect and prolong the ‘effective lives’ of these structures it is necessary to maintain a secondary defence, in the form of a shingle beach, seaward of these defences.

Through targeted shingle replenishment we have successfully countered natural losses. This has resulted in beaches of ‘greater stability’ and of ‘sufficient volume’ to protect the hard engineered defences. This has meant that, since completion of the first phase, we

have had no inundation flooding events, or loss of land as a result of coastal erosion, within the geographical scope of the project. Prior to our 'Beach Management' activities, the failure of the timber breastworks in Bracklesham was common. This would sometimes occur multiple times in a given 12 month period (such as 2013/14), with subsequent landward erosion requiring costly intervention and remediation.

The sea wall would be at risk of undermining without a shingle beach in place. Should this happen catastrophic failure of the sea wall would eventually occur. The shingle beach protects the sea wall by absorbing much of the destructive wave energy that would otherwise act directly upon the wall. This form of protection has been proven to be effective; a shingle beach has been maintained on this eroding frontage for the past 10 years through the implementation of a beach management programme. This on-going beach management programme has consisted of targeted shingle replenishment and the enhancement of the numerous groyne structures (which help retain beach material in the desired areas by disrupting, and therefore slowing, sediment drift).

If there was a failure to maintain appropriate beach levels we would expect the hard-engineered sea defences around Selsey, Bracklesham & East Wittering to fail within the next five years. Such a failure would lead to the tidal inundation of land on the east side of Selsey; flooding up to 400 homes as well as the destruction of essential infrastructure and amenity assets. On the west side of Selsey and at East Wittering the loss of the sea wall would result in rapid 'catch-up' erosion, leading to the loss of at least 78 houses over the subsequent 20-year period. Figures 3 & 4 (on the following page) show the latest erosion maps for the frontage.

Photo 1 (on the right) was taken soon after a breach of the sea wall, caused by a 1 in 1 year storm event (100% AEP), back in 2007. This image illustrates the importance of maintaining a beach seaward of the sea wall, as it clearly shows the significant erosion that can occur almost immediately following a localised failure. Beach management over the past ten years has prevented further failures of this nature.



Photo 1: Sea wall failure at Selsey West Beach

Photo 2 below was taken at East Wittering following a winter storm in 2014, and shows the result of persistently low beach levels and ageing defences. Failures like this were commonplace before the introduction of beach management and often required costly emergency repairs to prevent the loss of properties through erosion.



Photo 2: Low beach levels at East Wittering causing undermining of timber breastworks (Jan 2014).

1.2 The implications of “Do Nothing”

Maintaining a beach is the primary method we employ to achieve our desired coast protection outcomes. However, it is important to recognise that there is more to maintaining a beach than just periodic shingle replenishment. The groyne structures perpendicular to the shoreline are designed to hold deposited (and natural) beach material in the desired areas for longer (through the control of ‘longshore beach sediment transport’ which is driven by currents and tidal forces). The beach absorbs incidental wave energy and protects the underlying clay substrate from erosion. The implication of ‘doing nothing’ is that the shingle on the beach will continue to erode, at an increasing rate, which will result in a narrowing and steepening of the beach over time. Eventually there would be little, or no beach left to offer protection to the sea wall and groyne structures. This would leave them subject to both undermining and wave loadings of significantly increased magnitude. Such exposure over any prolonged period will considerably reduce their residual life and ultimately lead to their failure. It is also worth noting that the consequence of just ‘allowing beach levels to become lower than is desirable’ will result in excessive wave reflection off the seawall and groynes, which in turn would lead to a further acceleration in the lowering of beach levels.

Due to the current estimated residual life of the defences under the ‘do nothing’ approach, defence failures/collapses would be expected within 5 years. Failure of the defences will lead to the inundation of low-lying land and properties. Additionally, the rapid ‘catch-up’ erosion of higher land would also be expected. Photo 1 (found on page 8) illustrates a failure of the sea wall on this frontage that occurred before on-going active beach

management was initiated. In that instance, 15 metres of erosion occurred during a single '1 in 1 year' (100% AEP) storm event. There was no sign that the rate of erosion was slowing until emergency stabilisation and repair works were initiated.

The annotated maps below (figures 5 and 6) detail the baseline flood risk with flood extents and depths shown.

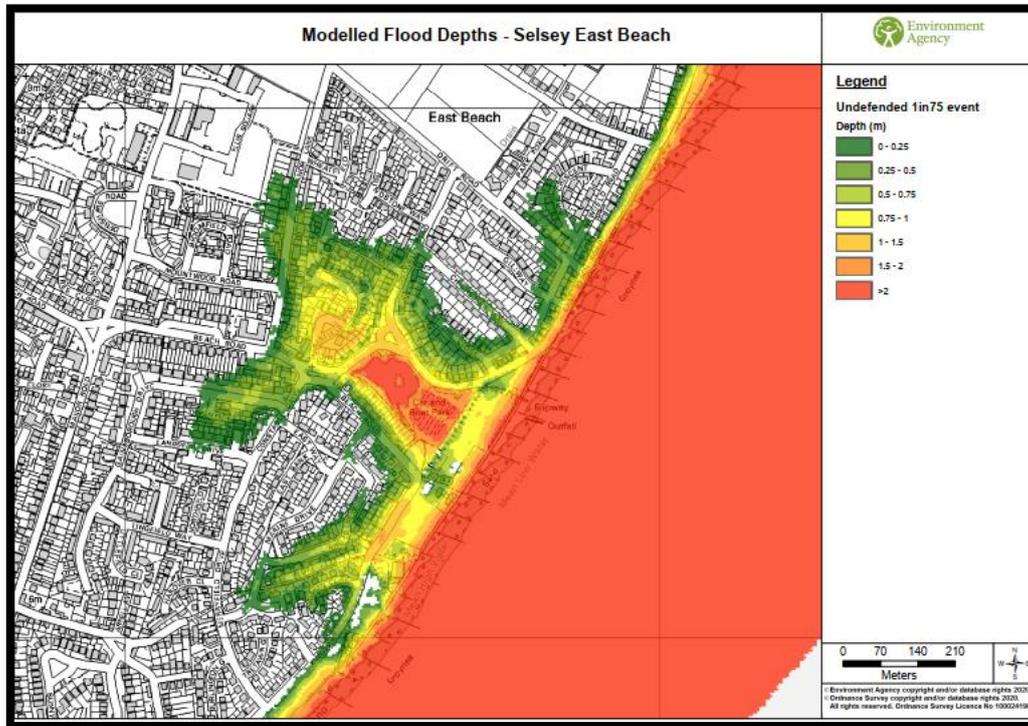


Figure 5: Flood depth and extent Selsey East Beach 1 in 75 year (1.33% AEP) event.

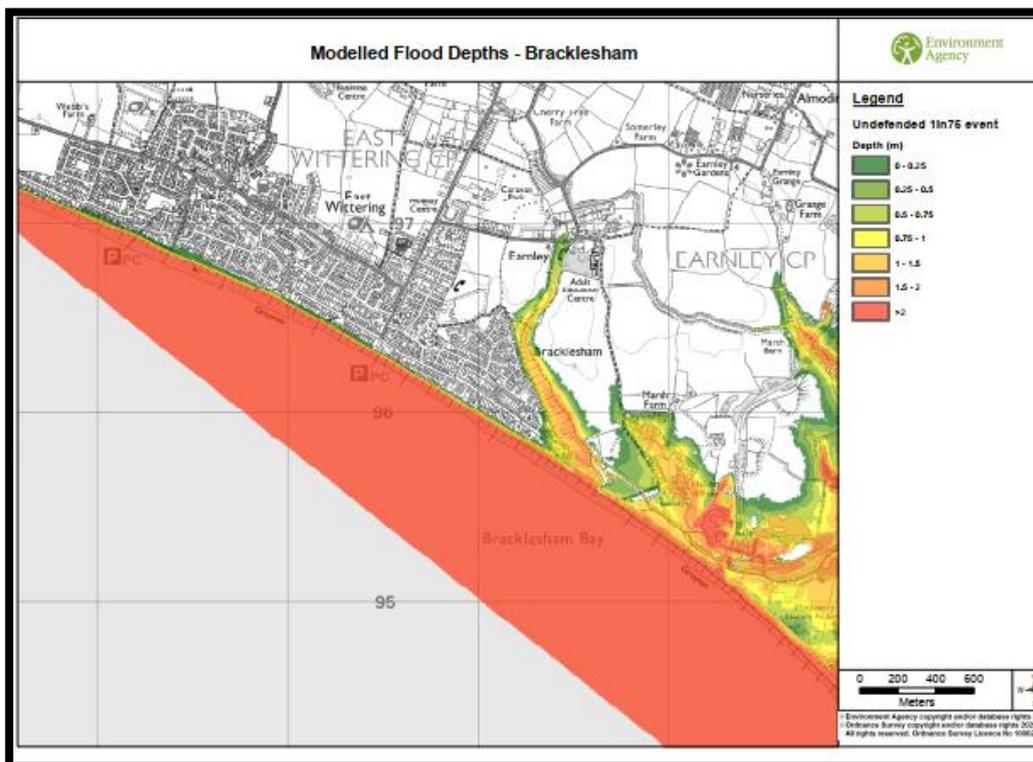


Figure 6: Flood depth and extent Bracklesham/East Wittering 1 in 75 year (1.33% AEP) event.

The approach taken for the estimation of erosion rates is consistent with the previous two approved phases of beach management. Whereby, without intervention, we would expect a breach to occur within 0 to 5 years. Then, following a breach, the initial rate of erosion would be 'rapid' as the coastline quickly re-adjusts to its 'natural' alignment. This estimation is supported by the observations made of previous failures. It is likely that by 'year 5' the coastline would have, on average, retreated by approximately 85 metres. (This estimation of 'catch-up erosion' is based upon a rate of 1.45 metres per annum, multiplied by a period of 60 years). Then, over the subsequent period of 15 years, we estimate the coastline would have, on average retreated by a further 20 metres. (This estimate is based upon a rate of 1.45 metres per annum, over that 15 year period).

Time Period	Erosion Rate	Erosion Distance	Cumulative Total
Years 0 to 5	1.45 metres per year x 60 years (Catch-up)	85m	85m
Years 5 to 20	1.45metres per year	20m	105m

The project's benefits have been derived from the approved 'Pagham to East Head Coastal Defence Strategy' (78 properties) which, based on observed rapid initial erosion, offers a conservative estimation of property losses.

Table 2 (below) outlines the current defences within the BMP frontage and their residual life; with and without the secondary defence of a beach.

Frontage Location	Defence Type	Residual Life (with loss of beach)	Residual Life (with beach retained through BMP)
Bracklesham	Consistent Reinforced Concrete (RC) Wall	10-20 years (no evidence of current failure)	20 years +
	Timber Groynes	0-2 years (many have already reached the end of their serviceable life)	2 years +
East Wittering	Timber Breastwork	0-2 years. (multiple failures have occurred every time exposed)	10 years +
	Timber Groynes	5-10 years	10-20 years
Selsey West Beach	Variable RC Wall	0-5 years	5 years +
	Timber Groynes	0-5 years	0-5 years
Selsey East Beach	Consistent RC Wall	0-5 years	5 years +
	Timber Groynes	0-5 years	5-10 years

Alongside the capital investment in beach management, the Council are committed to maintaining the existing defences (wherever this is an economically viable option) to extend their residual life.

1.3 Shoreline Management Plan / Coastal Defence Strategy

The 'Selsey Bill' and 'East Beach' coastal frontages are covered by the 'Beachy Head to Selsey Bill Shoreline Management Plan 2007'. The 'Selsey West Beach', 'Bracklesham' and 'East Wittering' frontages are covered by the 'North Solent Shoreline Management Plan (Hurst Spit to Selsey Bill) 2011'. Within these two Shoreline Management Plans all of these frontages have an adopted policy of 'Hold the Line'.

The Pagham to East Head Coastal Defence Strategy (PEHCDS) was approved in 2009, with an adopted policy option of 'Hold the Line – sustain', over the next 100 years, for both Selsey and Bracklesham & East Wittering. Works proposed by the strategy include:

- **Selsey:** Raising the height of the existing seawall and groynes, and **ongoing beach recycling/recharge**.
- **Bracklesham and East Wittering:** Adaptation of the existing defence structures; rebuilding of some structural elements; general **beach management** including re-distribution of material.

The proposed project is therefore fully in accordance with the relevant SMPs and the recommendations of the approved strategy for the frontage.

Undertaking beach recycling and recharge activities will extend the life of the fixed coastal defence assets and delay the need for their major reconstruction. However, a project for major capital coast defence interventions in Selsey is on the EA Medium Term Plan (MTP) and is expected to progress after this latest phase of beach management is completed (2026).

1.4 Objectives / Constraints

Project objectives:

- The replenishment of shingle on the Selsey frontage to commence in January 2022 to maintain or enhance current beach volumes. (Subsequent deliveries will then be made each year, for five years).
- Groyne enhancements to be undertaken annually, to promote the retention of beach material.
- The retention of an 'accessible' beach environment of leisure and amenity value, for the full duration of the 5 year project. A desirable indirect consequence of the project will be the retention of coastal access (as the project will protect the coastal path).
- No loss of property to erosion in the period 2026 to 2031 (the 5 years following the completion of the project).
- No 'inundation flooding' of property from events not exceeding a 0.5% AEP in the period 2026 to 2031 (the 5 years following the completion of the project).
- The promotion of environmental benefits and project efficiencies throughout the project.
- The completion of the project by March 2026.

Project Constraints:

- The works intercept, or are in close proximity to, the Bracklesham SSSI, Solent and Dorset Coast pSPA, Selsey Bill and the Hounds MCZ. Natural England (NE) was consulted (as was the case with all previous phases) and has confirmed that they are satisfied with our assessment of the impact (not significant) and therefore have no objection to these proposals.

The following potential constraints have either been discounted or resolved during the past ten years:

- There are no known archaeological features of international, national or local importance that could be disturbed by the proposed beach management operations.
- The Council own, or have control / consent to work over, all the land on which the works will be undertaken.
- Planning permission is not required for the proposed works (this was confirmed during the initial phases of this project).
- A 10 year Marine Management Organisation (MMO) license (L/2018/00483/1) is in place, which covers the scope, duration and location of the proposed beach replenishment in Selsey; with environmental constraints and Water Framework Directive addressed as part of the application.

The BMP is a 5-year plan which allows for a flexible approach to the work to be undertaken. It enables packages of work and/or items to be grouped together and delivery timings to be adjusted, all of which also lead to significant efficiency savings.

1.5 Assumptions

The assumption that 'Beach Management' remains the preferred approach for this section of coastline is heavily influenced by the successful delivery of previous projects. This success provides a high level of confidence in future successful delivery.

The residual life of the existing hard-engineered defences are founded upon our experience of previous failures as well as internal quarterly asset inspections and annual asset surveys, the latter completed by an external consultant (RHDHV), which provide us with a clear understanding of asset condition.

Beach management has been sufficient to successfully protect this frontage for the past ten years. During this time, we have evolved our approach to overcome the challenges we have faced, and we have also improved our approach to ensure efficiency savings are realised and reported. The changes implemented are now 'business as usual' for this project.

There has not been an upward trend in the unit cost of shingle delivery and placement; this is a result of lessons learnt from previous projects. By understanding the needs of contractors, we have been able to reduce the risk they are exposed to. In turn, this has led to efficiency savings through 'more competitive' tenders. The project assumes no significant increase in cost of 'material delivery and placement' during the project life, but there is sufficient risk contingency included to account for this assumption. The rates for timber works are fixed as part of a long-term maintenance contract which covers the majority of the project period, which itself was an efficiency saving achieved over the previous 'annual procurement' arrangements.

There is also a general assumption that there will be no significant changes to availability of material or environmental designations. To manage the risk a MMO license to re-charge the beach (L/2018/00483/1) which covers the entire period of this proposed project (2021 to 2026) was sought and subsequently granted.

2. Economic case

The economic case for the intervention is based on the approved 'Pagham to East Head Coastal Defence Strategy' (PEHCDS). It is considered a proportionate approach for this project to use these findings to demonstrate the economic case for this project (this has been accepted for the previous two phases of beach management).

The Environment Agency's 2D hydraulic inundation modelling, undertaken by JBA in 2016, and the SMP / observed erosion rates have been used to validate the at risk property number from the strategy. These figures were found to be conservative and there were a small number of additional properties protected. As part of the recently updated models a 'threshold measurement' was also added to the topographical level of the properties, further verifying the conservative nature of the strategy numbers.

The results of the comparison of properties at risk of flooding can be found in Appendix B.

The economic justification is based on the minimum to "hold the line – sustain" to avoid the "do nothing" impact of inundation (based upon the undefended model) which would result from a failure of the sea wall should beach levels lower and the wall become undermined.

2.1 Climate Change

The nature of the project means that by design it is adaptable to climate change, whereby, subject to sufficient material, a beach will naturally be reworked by the sea in response to storm activity and changing sea levels.

The impact on properties due to climate change is now captured on the partnership calculator, but because the project benefit period is five years, climate change does not have a significant impact on the costs or benefits over the benefit period.

Much greater scrutiny of climate change impacts will be required when appraising the future replacement of the groyne field and alterations to the sea wall (c.2026).

2.2 Cost Estimation

Potential FCERM measures were identified within the PEHCDS. These strategic options are summarised in Table 3 below:

Strategic Option	Description
No Active Intervention	No maintenance or improvements undertaken allowing the existing defences to deteriorate under the impact of natural coastal processes.
Do Minimum	This option will provide a patch and repair approach on existing assets. This approach will revert to No Active Intervention once the residual life of existing defences is reached and cannot be extended any further.
Hold The Existing Defence Line	Maintaining or changing the standard of protection on the existing defence line. The implementation of this policy can be undertaken using the following approaches: <ul style="list-style-type: none">○ Maintain – Defences are maintained at their current level to minimise the damage from failure. Because of the effects of climate change there will be a reduction in the standard of protection over time.○ Sustain – The defence levels are improved over time to preserve the

	<p>standard of protection taking into account climate change.</p> <ul style="list-style-type: none"> o Improve – Raise the standard of protection above that already existing.
Managed Realignment	Policies aimed at allowing a landward movement of the shoreline position with some form of management intervention, on both flood and erosion prone frontages.
Adaptive Management	Adaptive Management is an approach, which promotes flexible decision making with an emphasis on sequential decisions and actions in the face of uncertainty. It provides the opportunity for improved management as more understanding of the system is gained over time. A Management Plan is established which sets out its objectives, possible measures to achieve these objectives and a series of trigger points for where intervention may be required. Monitoring forms a key element of the process.

The shortlist of options extracted from the PEHCDS for the Selsey and Bracklesham & East Wittering frontages, over the next 100 years, were compared. Hold the line – Sustain: Beach Management Plan (with major capital works every 25 years) gave the greatest Benefit to Cost Ratio, and therefore this approach has been pursued to date. The benefit cost ratio from the partnership calculator for this approach/phase is 20.9.

Table 4 (below) details the annual construction costs for this phase with estimates based upon the last ten years of beach management on this frontage. During this period contracts were awarded following a competitive tendering process using a framework.

Table 4: Estimated Annual construction costs			
Item	Quantity per year	Rate	Cost
Delivery & Placement of Coarse Shingle	7,000 tonnes	£25 per tonne	£175k
Timber Groyne Enhancements	Variable	Fixed under contract	£50k
Total			£225k

An allowance for risk, and staff time (0.2 FTE) has also been included in the financial summary with a total project cost over the five years of £1.25m.

A detailed appraisal of option costs/benefits over 100 years was undertaken for the approved Pagham to East Head Coastal Defence Strategy. The results of which were that the preferred approach (the option which offered the best benefit cost ratio) for the Selsey/East Wittering frontage was ‘Hold the Line – Sustain’.

The options were appraised in detail, as part of the approved strategy, so following consultation with the Environment Agency it was agreed that there was little benefit in repeating this exercise at this stage, when the case was so strong for intervention.

A new financial appraisal will be undertaken to support the submission of the business case for the first substantial groyne replacement/sea wall works expected to take place around 2030, to capture any significant positive change in benefits or costs.

2.3 Preferred Way Forward

The preferred way forward is to continue with a combined BMP for Selsey and Bracklesham & East Wittering, to achieve the adopted PEHCDS recommended management option of 'Hold the Line – Sustain' along these frontages. This approach achieves a positive 'Outcome Measure Score' and allows time for collection of contributions towards the larger capital schemes.

This 'Short Form Business Case' seeks funding for the third 5 year tranche of the BMP. If approved, the BMP report will be reviewed / updated by us here at Chichester District Council, with construction works including defence upgrading, beach recharging and beach recycling to be completed, as advised by the BMP.

Appraisal work has commenced, and will continue simultaneously for the "significant" capital works which will commence in 5 to 10 years' time.

3. Commercial case

A key Council priority is to manage our finances prudently and effectively. This includes ensuring 'best value' is achieved through procurement of professional services for, and the construction of, FCERM projects.

To date, all works have been awarded through competitive tender, via a framework of contractors. All construction works for this new project will be awarded through competitive tender and in compliance with the Public Contract Regulations. Contracts will be awarded in accordance with the Council's constitution, financial standing orders and using the current NEC contract terms and conditions.

Efficiencies achieved during the past five years (when reporting became a requirement) include:

- A change to the shingle grading curve to utilise "rejects" which were previously excluded. This not only reduced the price per tonne, through a reduction in waste and the necessity for screening, but also provided a better (bigger) mix of stone for the purposes of coast protection.
- Increased design and supervision undertaken in house.
- Procurement of timber groyne enhancements via a fixed term contract by a specialist contractor.

These above practices are now considered 'business as usual' and the project team will continue to seek and report further efficiencies for the next phase of beach management.

4. Financial case

Financial Summary

Table 5 (below) summarises the project costs. The figures are based on our experience of delivering 'beach management' on the frontage over the previous ten years. They include efficiencies achieved which allow greater volumes of material to be delivered without an increase in cost (compared to the last five years).

Table 5: Preferred Option Financial Summary		
Item	Whole Life Cash Cost¹	Total Project Cost (approval)²
Costs up to OBC³	£12,500	Excluding previous applications
Costs after OBC		
Salary Costs	£60,000*	
Cost of Professional Advice	£12,500	
Site Investigation and Survey	£0	
Construction	£1,125,000**	
Supervision	£0 (included in salary costs)	
Environmental Mitigation⁴	£0	
Land Purchase and Compensation	£0	
Other⁵	£0	
Risk Contingency (See S.12 of the Grant Memorandum)		
Risk or Optimism Bias⁶	£40,000	
Future Cost (Construction and Maintenance)	(Cash) £0	
Optimism Bias on Future Cost	£0	N/A
Project Total Cost	£1,250,000	£1,250,000

Notes regarding Table 5 above:

- * Salary Costs include supervision and are based on 0.2 FTE (any time above this will be borne by the Council)
- ** Construction costs are derived from experience of delivery and placement of coarse shingle in the same location, and enhancement of timber groynes on the frontage.
- *** The previous phase of Beach Management at this location was delivered for £1.25m. Due to experience and the effect of identified efficiencies there is a high level of confidence that this project can, and will, be delivered for £1.21m. However, we have retained a £40k risk pot. This risk contingency figure is lower than the one used in previous phases, as in the past there were greater degrees of uncertainty. We are also aware that this figure is low (when considered as a percentage of total project cost) compared to many projects; this is due to our high level of confidence in delivery and cost, based on our prior experience of similar projects.

Funding sources

Table 6 below includes the sources of funding, which in this case is proposed to be 100% GiA. Although there are no external contributions secured for this project, the Council are instead exploring options, including putting aside funds on an annual basis (up to £50k p/a) which would be available as an external contribution towards the replacement of the groyne field and alterations to the sea wall (where contributions are likely to be required to secure a sufficient partnership funding score).

Table 6: Sources of funding and Partnership Funding Score			
Item	%	Description	Total (£k)
Raw Partnership Funding Score	186		
Funding			
Contributions (list)		N/A	0
Other (list)		N/A	0
Local Levy		N/A	0
Non GiA Contributions		N/A	0
Adjusted Partnership Funding Score	186		
Grant in Aid		Grant in Aid	1250
Project Total Cost (approval)			1250

5. Management case

5.1 Project and contract management

Design and construction will wherever possible be delivered by the Council's in house engineering team. Where specialist advice is required the council will revert to their framework consultant Royal Haskoning DHV (RHDHV).

The key project staff members are:

- Dominic Henly (Principal Engineer): Lead Officer/Project Manager, responsible for project delivery including overseeing design, supervision and signing off the work/project.
- Andrew Frost (Director): Project Sponsor with authority (subject to political resolution) to award contracts and allocate internal resource.
- Duncan Keir (Engineer): Supporting the Project Manager's design and supervision of the works.
- RHDHV: Consultant engineers under contract to provide support/engineering ad hoc advice.

5.2 Schedule

The project will run for five years, with the beach recharged in January each year. Groyne enhancements will be planned and programmed in response to changing beach levels and asset survey findings.

Table 7: Schedule of main events	
Event [Examples only included below]	Date (DD/MM/YY)
Work to be started on site (Hillfield Road)	31/01/22
Year two beach recharge (Danefield Road)	07/02/23
Year three beach recharge (East Bracklesham Drive)	04/02/24
Year four beach recharge (Hillfield Road)	03/02/25
Year five beach recharge (Danefield Road)	02/02/26
Works complete	31/03/26

5.3 Outcomes

448 properties will be better protected from flooding and at least 78 properties will be protected from loss due to erosion over the next 5 years. Outcomes will be reported to PPMT in accordance with delivery.

The replenishment of beaches in front of the properties will indirectly benefit an area of vegetated shingle with additional future supply; this area also protects an existing brackish water habitat which relies solely on the shingle beach.

There will also be additional amenity benefits through the retention of a useable beach area.

During (and following) completion of the project the council will continue to maintain the groynes and sea wall (where it is economically viable) to maximise their residual life, and will own 'the beach' while it is retained on, or within our ownership/control.

Table 8: Outcome Measures delivered by the project	
Contributions to Outcome Measures	
Outcome 1 – Ratio of whole-life benefits to costs	
Present value benefits	£26,112k
Present value costs	£1,250k
Benefit: cost ratio	20.9
Outcome 2 – Households at reduced risk [Values taken from the PF calculator]	
2a – Households moved to a lower risk category	448
2b – Households moved from very significant or significant risk to moderate or low risk	380
2c – Proportion of households in 2b that are in the 20% most deprived areas	0
Outcome 3 – Households with reduced risk of erosion [Values taken from the PF calculator]	
3a – Households with reduced risk of erosion	78
3b – Proportion of those in 3 protected from loss within 20 years	78
3c – Proportion of households in 3b that are in the 20% most deprived areas	0
Outcome 4 – Water framework directive [Values for OM4a to 4c taken from the PF calculator]	
4a – Hectares of water-dependent habitat created or improved (ha)	0
4b – Hectares of intertidal habitat created (ha)	0
4c – Kilometres of river protected (km)	0
4d – Kilometres of WFD water body enhanced through FCRM	0
4e – Kilometres of water body opened up to fish and /or eel passage through FCRM	0
4f – Kilometres of river habitat enhanced (including SSSI) through FCRM	0
4g – Hectares of habitat (including SSSI) enhanced through FCRM	0
4h – Hectares of habitat created through FCRM	0
4a – Hectares of water-dependent habitat created or improved (ha)	0

5.4 Risk, constraint and dependency management

A risk register has been developed to identify and manage risks (table 9), and the management of risk will be undertaken by the Project Team.

Table 9: Main risks from the risk register			
Risk		Risk Owner	Mitigation
1	Funding risk – OBC does not receive FDGiA funding.	Client	<ul style="list-style-type: none"> Seek alternative sources of funding, which is likely to be difficult in the short term. If risk is realised, then develop of an exit strategy to commence.
2	Further failure of sea wall / breastworks (moderate risk).	Client	<ul style="list-style-type: none"> Regular monitoring of assets and timely R&M. Regular monitoring of beach levels and targeted recharge.
3	Weather Conditions delaying construction activities (low risk).	Client / Supplier	<ul style="list-style-type: none"> Ensure contract deals with risk and includes flexible start date but fixed completion date. Tidal working designed out wherever practical.
4	Community opposition to lorry movements (low risk).	Client	<ul style="list-style-type: none"> Community engagement throughout the project. Leaflet drops before works. Controlled working hours.
5	Environmental Concerns leading to delays (low risk).	Client	<ul style="list-style-type: none"> Consult with Natural England throughout the BMP process to address any issues.

Table 10: Constraints and Dependencies		
Constraint or Dependency		Impact
1	Securing FDGiA funding.	Project may be non-deliverable.
2	Leisure use of the beach (summer).	Works can only be undertaken outside of the summer season (except emergency interventions).
3	MMO license for recharge at East Bracklesham Drive.	Failure to secure license would prevent delivery in this location, replenishment would be diverted to area where existing 10yr license is in place.

5.5 Sustainability

Sustainable coastal defence is a key driver of the project. The project aims to mimic and work with natural processes as closely as possible. The key measures which will be implemented to maximise sustainability of the project are:

- Shingle will be deposited in a single location towards the start of the sediment cell. Natural processes will be utilised to move the material through the frontage, minimising movements of plant on the beach.
- Shingle will be sourced from as close to the project location as practical, thus reducing transportation miles.
- Timber will only be sourced from a sustainable supplier (this is a contract requirement).

The PEHCDS Strategic Environmental Assessment (SEA) was undertaken to assess the strategic options for each frontage in the context of the objectives of the Water Framework Directive. Tables 11 to 13 (below) illustrate the impact assessments undertaken by the SEA at Selsey and Bracklesham / East Wittering respectively.

Table 11: Key to Option Assessment Tables.

Key to the option assessment tables			
---	Major adverse	+++	Major positive
--	Moderate adverse	++	Moderate positive
-	Minor adverse	+	Minor positive
0	Negligible	N/A	Not applicable
S = Short Term			
M = Medium Term			
L = Long Term			

Table 12: Option Assessment Table for Selsey

Objective	No Active Intervention			Do Minimum			Hold the Line (Maintain)			Hold the Line (Sustain)		
	S	M	L	S	M	L	S	M	L	S	M	L
1 Manage flood risk to people, property and the environment	--	---	---	-	--	---	0	-	--	+	++	+++
2 Conserve and enhance biodiversity	0	-	-	0	-	-	0	-	-	0	-	--
3 Maintain and enhance opportunities for recreation and tourism	0	-	--	0	-	-	0	0	-	0	+	++
4 Protect farmland where sustainable to do so	0	-	--	0	0	-	0	0	-	0	0	0
5 Protect and enhance water resources	0	-	--	0	-	-	0	0	-	0	+	+
6 Protect features of archaeology and cultural heritage	0	-	-	0	0	-	0	0	0	0	0	0
7 Maintain and enhance landscape character and visual amenity features	-	-	--	0	-	-	0	0	-	0	-	-
8 Mitigate/minimise future impacts of climate change	---	---	---	--	---	---	-	--	---	+++	+++	+++
9 Promote the principles of sustainable development	++	++	++	+	+	+	-	-	-	-	--	---

Table 13: Option Assessment Table for East Wittering and Bracklesham

Objective	No Active Intervention			Do Minimum			Hold the Line (Sustain)		
	S	M	L	S	M	L	S	M	L
1 Manage flood risk to people, property and the environment	--	---	---	-	--	---	+	++	++
2 Conserve and enhance biodiversity	0	0	0	0	0	0	0	-	-
3 Maintain and enhance opportunities for recreation and tourism	-	-	--	0	-	--	+	+	+
4 Protect farmland where sustainable to do so	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5 Protect and enhance water resources	0	-	-	0	-	-	0	+	+
6 Protect features of archaeology and cultural heritage	0	-	--	0	-	-	0	+	+
7 Maintain and enhance landscape character and visual amenity features	0	-	-	0	-	-	0	0	0
8 Mitigate/minimise future impacts of climate change	---	---	---	--	---	---	+++	+++	+++
9 Promote the principles of sustainable development	++	++	++	0	0	0	-	--	---

5.6 Assurance

The council have worked closely with our Environment Agency colleagues when developing past BMP phases, and this has also been the case with the current project/business case.

Internal approval is in place from CDC (Director Level) to proceed with the outline business case submission. Further approval will be required from the Council's Cabinet to draw down grant payment (once the case for funding has been approved by the EA). This "Key Decision" is on the forward plan for early in 2021.

In 2018, a 10 year license from the MMO (L/2018/00483/1) was secured, which covers the Selsey shingle replenishment element of this project.

5.7 Engagement with Stakeholders and compliance with the Equality Act 2010

Beach management has been undertaken successfully for the past 10 years, during which engagement and communication with stakeholders has been undertaken. Most stakeholders now understand the work and its impact on them.

Each year residents and key stakeholders such as the Town/Parish Council will be notified of upcoming works via a door to door leaflet drop.

There have been no equality issues identified to date, and the project team do not expect of any going forward. However, this is something the Council will continue to monitor.

5.8 Evaluation / Project Success

Successful delivery of the project will be monitored through the Council's performance monitoring system. The project will be evaluated in accordance with the Councils internal project management procedures.

The project will be deemed a success if the outcome measures are achieved within the approved budget and timescales.

Appendix A: Partnership funding calculator

Appendix B: Strategy vs Current 2D modelling Properties at risk