Project name – Chesil Cove Sea Wall Improvements
Project stage / gateway- Outline Business Case


Chesil Cove Seawall (Jacobs)

Project type: simple change

Assurance route: NPAB

Project stage: OBC

Date: 12 Oct 2026

Version: 11

Check your project type is simple change

You should use this template where your project has followed the simple change appraisal type from the appraisal guidance.

A simple change type appraisal is for standalone projects where an FCERM strategy is not required.

Sections 4 and 7 of the FCERM Appraisal Guidance provide more detail on selecting and carrying out an appropriate appraisal type.

You should delete this page before submitting your business case for assurance.

Financial Scheme of Delegation (FSoD) approvals

You must complete section 1 of this sheet.

If your project is Environment Agency-led, you must complete section 2. If your project is led by another Risk Management Authority, you must complete section 3.

☐ Note, this is a check box. Click on it to mark it 'checked' ☒.

Section 1: all projects should complete this section

1.1

Project name (Enter project name exactly as it appears on AIMS PD PoL)	Chesil Cove Sea Wall Improvements
SOP Project Code	WXC501E/000A/098A
Start date (dd/mm/yyyy)	21/04/2023
End date (dd/mm/yyyy)	
For FSoD team use only	
FSoD reference	
FSoD date (dd/mm/yyyy)	

1.2

Items approved under Section A	**Items approved under Section C6/C7/C11**	**FSoD Ref**	**Date** (dd/mm/yyyy)	**Amount Requested** (£k)	**Approval amount** (£k)	**Current Total Approval** (£k) (for FSoD team use)
OBC				480	480	
	BCUR 1					
Add rows as required						
Total project cost (£k) (Estimated at SOC & OBC, actual at FBC) (£k)					10,960	
Whole Life Cash Cost (£k)					13,957	

* SOC / OBC / FBC / single stage business case

1.3

Lead assurer	**Post title**	**Assurance confirmation**			**Date** (dd/mm/yyyy)
		RED ☐	AMBER ☐	GREEN ☐	

1.4

Information to be highlighted to the Approving Officer

1.5

If the business case contains sensitive or commercial information or data that should be restricted (see Government Security Classifications) please tick the box.	☐

1.6

FSoD approver name(s)	**Post title**	**Attach emailed approval** (not email address)	**Date** (dd/mm/yyyy)

1.7

FSoD schedule	**Description**	**Check relevant box**
A1	Projects (including FCRM or Navigation revenue)	☐
A2	FCRM or Navigation capital projects	☐
Name and FSoD ref of approved strategy (A2) if applicable		
A4	FCERM capital projects led by LA, IDB and other RMAs	☒
T2	Corporate Property Projects / acquisitions	☐

1.8

For FSoD team use only:

Section 2: only Environment Agency-led projects should complete this section

2.1

SOP Project Code	
Programme	
National team name	
Area name	
Function	

2.2

Role	Name	Post Title	% time on project
Project Sponsor			
Project Executive			
Project Manager			

2.3

Required level of Environmental Impact Assessment (EIA) from programme	N/A	Low	Medium	High
	☐	☐	☐	☐

Section 3: only other RMA-led projects should complete this section

3.1

RMA reference number	

3.2

Assurance and endorsement from Risk Management Authority	
I confirm that this business case meets our guidelines, quality assurance requirements, environmental obligations and Defra investment appraisal conditions. All internal approvals, including member approval, have been completed. I apply to the Environment Agency for capital grant and local levy in the sum of £_____ (Grant Claim Value).	
Name of RMA Project Executive	
Date of endorsement (dd/mm/yyyy)	
Attach emailed endorsement (not email address)	
Version approved	

1. Introduction and project summary (executive summary)

1.1. Introduction

The seawall at Chesil Cove is located at the toe of a large landslide system at the West Weares. The seawall was constructed in 1965 to prevent coastal erosion at the base of this system, and unloading and destabilisation of the cliffs situated immediately behind.

Since construction of the seawall in 1965, ongoing coastal erosion has stripped the beach and rock fronting the southern end of the structure exposing it to erosion and undermining. This loss of support has resulted in rotation of the structure and the development of cracks in the southern parapet wall. Augmentation works in 2011 and the further addition of rock armour in 2022 have provided temporary protection but have not fully addressed these issues.

The ongoing impact of climate change on sea level rise and storm power and frequency mean that the structure is experiencing increasingly larger wave impacts and beach draw-down forces. Beach and foreshore profile analysis indicates a general trend of erosion in front of the seawall.

With no further investment in the seawall, the condition will continue to deteriorate. Left unchecked the southern end of the seawall will quickly fail – it is estimated that this could happen during the next significant storm, which will lead to damage to the rest of the structure and, ultimately, allow coastal erosion and shoreline retreat to resume.

The resumption of marine erosion could trigger a rapid destabilisation of the coastal cliffs and slope behind, likely resulting in a reactivation of the whole of the existing landslide system in a relatively short time scale.

Under a Do Nothing scenario it is estimated that 51 residential and 1 commercial property, as well as 37 beach huts and a basketball court, would be lost. The latter comprise the 39 non-residential assets referred to elsewhere in this report. In addition, reactivation of the landslide could result in significant damage to a critical section of the A354 which would prevent access to the Isle of Portland peninsula. The A354 is the main access route onto Portland and if damaged would isolate the communities, businesses and HMP Portland prison south of the road. The Public Right of Way (PROW) which runs along the rear of the seawall would be disrupted and lost under this Do Nothing option. Note that roads and footpaths are treated as a separate category to non-residential assets in the economics assessment.

The most cost-effective option (Option 5A) to refurbish the existing seawall will include the installation of a new steel sheet pile wall with a capping beam along an 80m length of the wall. For the remainder of the wall, the capping beam will be repaired and joint repairs will be completed at the southern seawall and wing

wall. A rock revetment will be constructed on the beach fronting the seawall to dissipate wave energy and protect the sea wall from erosion and undermining.

Over time it is likely that beach levels fronting the northern end of the structure will also lower. An allowance has been included to extend the rock revetment further north so that the entire seawall is protected within the next 20 years.

The selected option will reinforce the existing sea wall providing resilience and continued stabilisation of West Weares. Failure of the sea wall could trigger a rapid destabilisation of coastal slope and cliffs behind, resulting in a reactivation of the whole of the existing landslide system. Continued toe erosion in the long term would ultimately lead the system to expand to the east and north beyond its 1858 footprint.

The seawall and surrounding area forms part of the Dorset & East Devon World Heritage Site (also known as the 'Jurassic Coast'), the Isle of Portland to Studland Cliffs Special Area of Conservation (SAC) and the Chesil and the Fleet SAC. The fronting intertidal area is also designated as part of the Chesil Beach and Stennis Ledges Marine Conservation Zone (MCZ) and as part of the Chesil and the Fleet SAC. The rock revetment would extend approximately 26m from the base of the seawall into these designations.

Natural England have been consulted and they have no objection in principle to the scheme. The correspondence is saved in Appendix Q.

This Outline Business Case (OBC) is being led by Dorset Council as the designated coast protection authority responsible for coastal erosion under the Coast Protection Act, 1949.

1.2. Recommendation

This document presents an Outline Business Case (OBC) to secure business case approval to improve the seawall at Chesil Cove, Portland, Dorset.

This business case seeks FSoD approval for £10,960 k including £3,524k of Local Authority funding, £100k of Local Levy and £7,336k of FCERM GiA funding to progress to design and construction.

This project is forecast to deliver 25 OM3s and £42,894k in benefits (OM1A) for a total project expenditure of £10,960k.

2. Strategic case

2.1. Introduction

This document presents an Outline Business Case (OBC) for improving the sea wall at Chesil Cove, Dorset. The seawall at Chesil Cove, Portland, Dorset is located on the Chesil Cove frontage at the intersection of the north-western flank of the Isle of Portland and the most southeasterly part of Chesil Beach in Dorset. The extent of the seawall is shown in Figure 1.

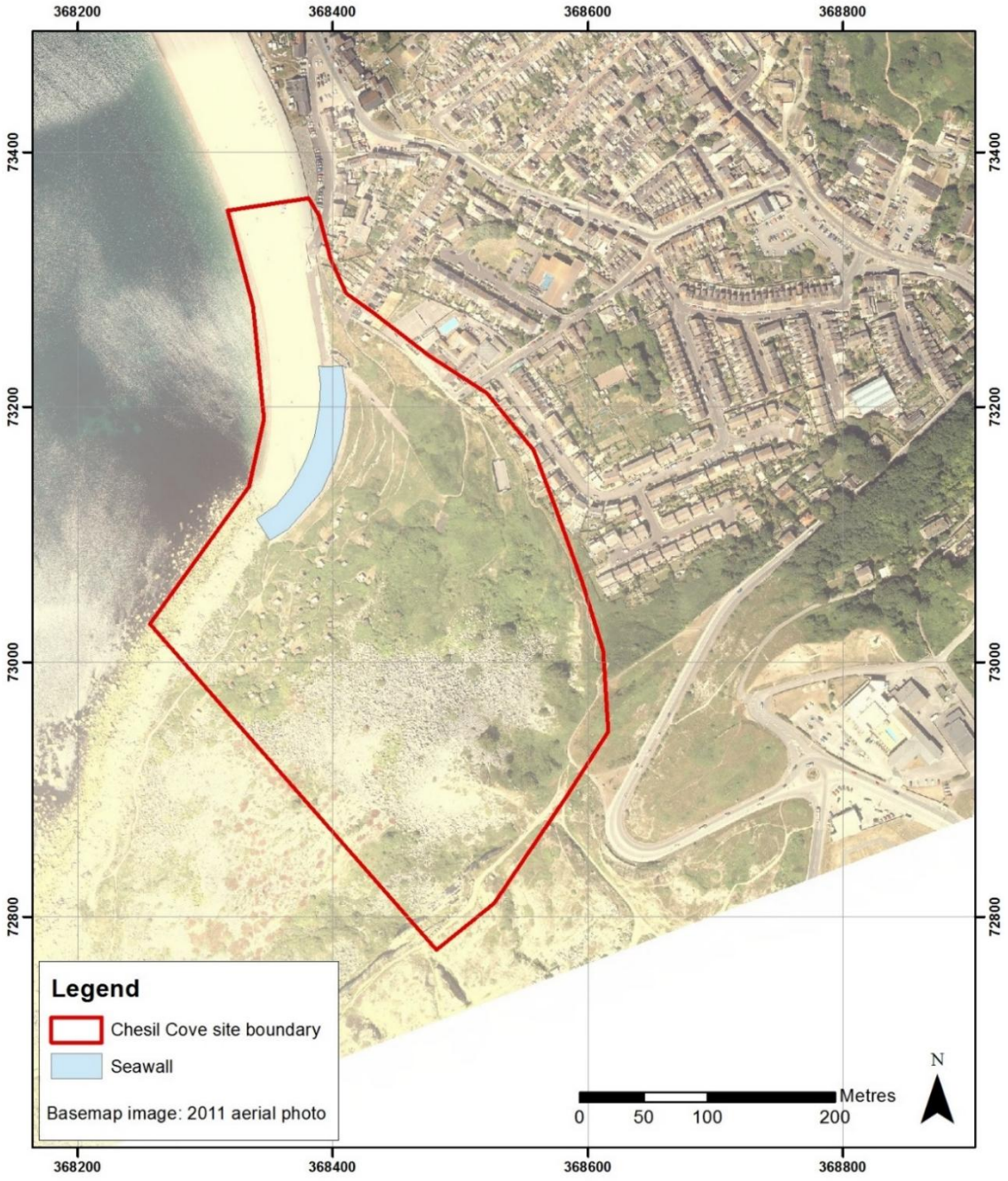


Figure 1. Location of Chesil Cove sea wall

The seawall at Chesil Cove fronts a large landslide system at the West Weares. The seawall was constructed in 1965 to prevent coastal erosion at the base of this system and unloading and destabilisation of the cliffs situated immediately behind. Due to the damage sustained to the structure in recent decades, and because climate change and sea level rise are resulting in an increase in coastal erosion and slope instability, there is a need to repair and strengthen the seawall to mitigate the increasing risk. Without improvement works the sea wall is expected to fail during the next significant storm.

Improvement works to the seawall will include the installation of a new steel sheet pile wall with a capping beam along an 80m length of the wall. For the remainder of the wall, the capping beam will be repaired and joint repairs will also be completed at the southern seawall and wing wall. A rock revetment will be constructed on the foreshore and beach fronting the seawall to dissipate wave energy and protect the sea wall from erosion and undermining.

The selected option will reinforce the existing sea wall providing resilience and continued stabilisation of the West Weares. Failure of the sea wall could trigger a rapid destabilisation of coastal slope and cliffs behind, resulting in reactivation of the whole of the existing landslide system. Continued toe erosion in the long term would ultimately lead the system to expand to the east and north beyond its 1858 footprint. Reactivation of the landslide would result in significant disruption to the A354 and loss of 51 residential properties and 39 non-residential assets within the landslide footprint.

The seawall is located in the ward of Chiswell which is in the 0-20% most deprived areas in the UK.

2.2. Strategic context

The study area falls within the Portland Bill to Eype (Thorncombe Beacon) policy unit of the 2010 Durlston Head to Rame Head Shoreline Management Plan 2.

The preferred policy option for Unit 6a02 – Chiswell to Chesil Beach, within which the seawall is located, is Hold the Line. The preferred policy options for neighbouring Unit 6a01 – Portland Bill to West Weare is No Active Intervention. There are no formal flood or erosion protection structures within this section.

A 100-year Flood and Coastal Risk Management Strategy of the Portland Underhill to Wyke Regis area, which includes the West Weares, is currently being prepared by Dorset Council in collaboration with the Environment Agency.

The intention of any scheme developed for Chesil Cove from this OBC would be to align with the SMP and Portland Underhill to Wyke Regis Strategy by preventing loss of coastal defence assets, coastal erosion and slope instability to preserve access to Portland and protect property and other assets.

West Dorset and Weymouth & Portland Local Plan - 2015

West Dorset and Weymouth & Portland prepared a joint local plan that forms the main basis for making decisions on planning applications and development in the area until 2031. It was adopted by Weymouth & Portland Borough Council on 15 October 2015 and by West Dorset District Council on 22 October 2015.

The key strategic objectives from the local plan of relevance to this scheme include:

“Protect and enhance the outstanding natural and built environment, including its landscape, biodiversity and geodiversity, and the local distinctiveness of places within the area – this will be the over-riding objective in those areas of the plan which are particularly sensitive to change.

Reduce vulnerability to the impacts of climate change, both by minimising the potential impacts and by adapting to those that are inevitable– this will be the over-riding objective in those areas of the plan which are at highest risk.”

Following the formation of Dorset Council in 2019, a new local plan for the wider Dorset area is currently in development. The council are working towards an adoption date of 2027 for the new local plan. This will supersede the former local planning authority local plans.

2.3. Current arrangements

The Chesil Cove seawall protects the base of the West Weares landslide system from coastal erosion. The seawall is located at the rear of the beach which consists of coarse shingle material overlying clay. The existing seawall is 150m in length and made up of a mass concrete recurve wall founded on reinforced concrete beams and steel sheet piles.

In recent decades the impact of climate change on sea level rise and storm power and frequency mean that the structure is experiencing increasingly larger wave impacts and beach draw-down forces. Three of the storms in early 2014, for example, exceeded the 1 in 50 year return period intensity and since 2007, 12 individual storms have exceeded the 1 in 50 year Return Period. Waves during these storms exceeded 7 m (Hs) in height (Jacobs, 2021).

Beach profile analysis also indicates that in general beach levels are reducing in front of the seawall. This is corroborated by bathymetric surveys which show the clays foreshore and nearshore are also lowering. This will result in increased exposure of the sheet pile toe of the wall leading to undermining, and wall rotation.

Emergency repair works were implemented by Dorset Council in 2011 following undercutting and the failure of the southern end of the seawall. The 2011

augmentation works included reconstruction of the wing wall and lower stair landing, as a ground bearing structure. Continued foreshore lowering and undermining means that these repairs have now lost support, and this has exposed the seawall's toe piling. Rock protection provided at the foot of the coastline abuts the south side of the seawall. In 2022, Dorset Council installed additional rock around the south-west extent of the seawall.

To inform this OBC, Jacobs undertook a visual inspection of the seawall in May 2023. The Chesil Cove seawall desk study and visual inspection was undertaken to assess the condition of the existing seawall and promenade, and to determine the potential impact of observed structural defects on seawall replacement and refurbishment options. The survey concluded that:

- Observations of the seawall suggest that there is ongoing gradual movement of the structure due to settlement or rotation.
- A large crack and joints are present in the parapet at the southern end of the seawall which monitoring shows are gradually widening. The crack formed shortly after construction of the seawall in 1965 but has worsened in recent decades. The 2011 augmentation works were designed to provide protection to the southern end of the seawall. However, because the piled foundation was not provided with this improvement and beach erosion has occurred, the works are now unsupported and hanging off the seaward face of the seawall and exerting a force which could exacerbate the observed settlement/rotation of the main structure.

It is estimated that the southern end of the seawall could fail in the next significant storm so that this part of the structure has no residual life.

Failure of the seawall would allow coastal erosion shoreline retreat to resume, which could trigger a rapid destabilisation of the cliffs and slope behind, resulting in a reactivation of the whole of the existing landslide system in a relatively short time scale.

If the seawall were to fail and a landslide to occur, significant damage would be incurred to houses, utilities, local roads, coastal footpaths, and the main access road to Portland (A354) which flank the landslide on its north and east sides.

The full Chesil Cove Seawall Inspection Report is provided in Appendix B.

2.4. Case for change

The Chesil Cove sea wall protects the base of the West Weares landslide system from coastal erosion. The seawall was constructed in 1965 to prevent coastal erosion at the base of this system and unloading and destabilisation of the cliffs situated immediately behind. By preventing coastal erosion at the toe of the landslide system, the seawall protects 51 residential properties, 1 business, 37

beach huts, a basketball court, coastal footpaths and roads (including the A354). The A354 is the main access route to and from Portland and if damaged would isolate the communities, businesses and prison south of the potential breach point.

Landsliding

About one quarter of the area of Portland and nearly all of its coastal fringe is affected by landslides of different types which are periodically active and pose potential significant hazards to engineering structures, infrastructure and property. The seawall fronts a large landslide system at the West Weares.

The geomorphological form of the Chesil Cove site is largely the result of a major landslide which occurred suddenly on Boxing Day 1858. The landslide caused a substantial toe heave of the beach and foreshore and left a series of terraced, back-tilted blocks and debris running parallel to the escarpment crest. Remnants of this and/or other similar large-scale landslide events remain visible today in the nearshore bathymetry data at Chesil Cove. An annotated image of the West Weares landslide is shown in the figure below.

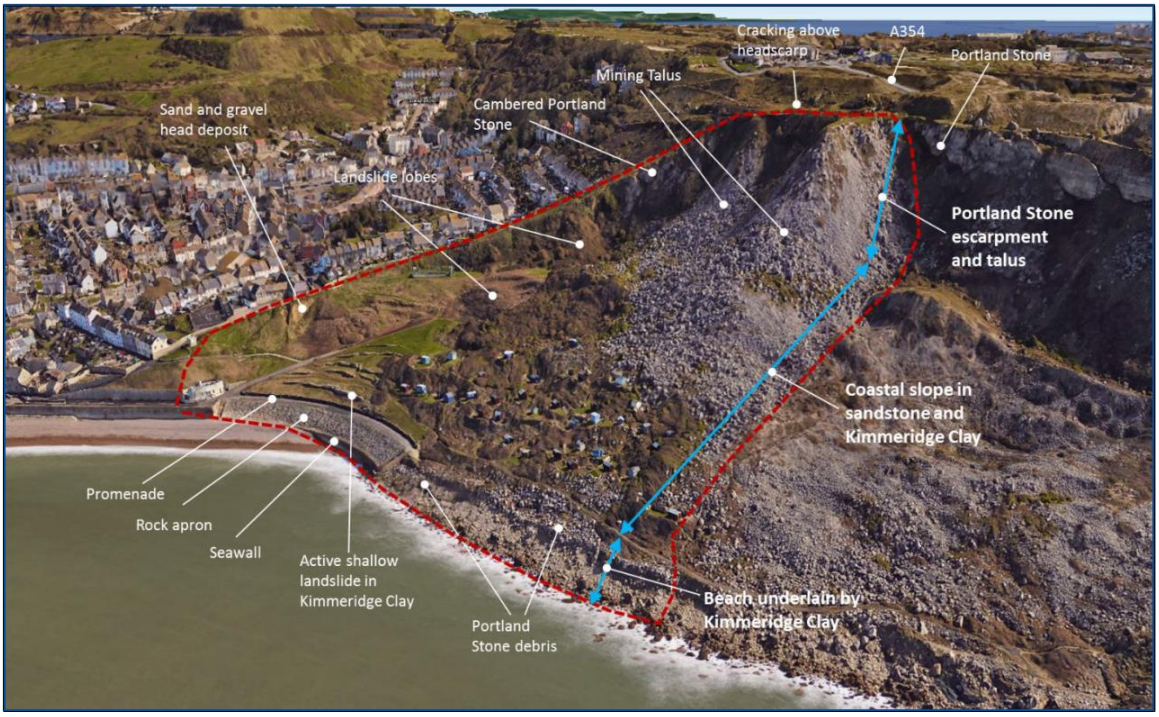


Figure 2. Chesil Cove site 3D image (Reference: CH2M, 2016 (Image Source: Stuart Morris).

Following the 1858 event, a mound of landslide debris thrust into the sea would have provided temporary protection of the slope landward from waves, erosion and undermining. However, the landslide debris was rapidly eroded away by the sea which allowed coastal erosion at the toe the landslide system to resume. This had the effect of reducing the stability of the slope resulting in ongoing landslide ground movement.

Concern about the stability, landslide movement and loss of hinterland prompted the construction of the current coastal defences in 1965. The seawall is 150m in length and is made up of a mass concrete recurve wall founded on reinforced concrete beams and steel sheet piles.

A walkover survey was undertaken in 2016 (recorded in 'Chesil Cove Desk Study and Preliminary Geomorphological Assessment Report' (CH2M, 2017)). The principal purpose of this study was to assess the influence of landsliding on the wall as a coast protection asset. Lowering of the fronting beach was noted which resulted in exposure of the sheet pile toe. However, no conclusive evidence was recorded that substantial landslide movements were taking place. Relatively shallow landsliding had occurred fairly recently (at the time of writing) behind the retaining wall at the rear of the walkway behind the seawall.

A geotechnical investigation was undertaken at the site in 2021 with the main aim to develop the conceptual ground model established in the desk study and to obtain information on ground conditions and controls on landsliding. The ground investigation findings indicated widespread ground disturbance and two distinct shear zones at depth which extend across the site (the shallower shear surface is active whilst the deeper shear surface appears to be relict). The shallower and potentially active shear surface is most likely linked to the most recent large-scale failure in 1858 when sea level was much the same as today. It was concluded that both shear surfaces are too deep to engineer economically.

The findings of the investigations also noted pressure ridges relating to shallow mudslides that apply earth pressure to the rear retaining wall of the seawall which has caused damage to the structure.

As well as the impacts of marine erosion, slope stability is influenced by groundwater and surface water springs within the cliff line at the junction of permeable Portland Sandstone and impermeable Kimmeridge Clay. Notably the seawall piles do not actively stabilise the pre-existing deep-seated landslide as the shear surface is below the base of the piles which means groundwater can influence the global stability of the coastal slope.

However, it was concluded that the sea wall does provide a vital service in preventing toe erosion, unloading and undermining of the slope above.

If the seawall were to fail, rapid toe erosion would ultimately lead the system to expand to the east and north beyond its 1858 footprint. There are already signs of instability above the headscarp to the east where cracking crosses the coastal path and disturbance of the A354 was reported prior to the works in the 1960s. Lateral extension to the north could reactivate pre-existing landslide systems known to exist beneath Fortuneswell.

A detailed account of landsliding and coastal erosion at the site is provided in Appendix I.

<u>Coastal Erosion</u>

Since construction in 1965, the seawall has been fully exposed to powerful long period swell waves approaching from the south and mid-Atlantic. The seawall experiences the full force of these waves due to its location and orientation and because the foreshore shelves away steeply so that very little wave energy is attenuated before reaching the structure. The impact of climate change on sea level rise and storm power and frequency mean that the structure is increasingly exposed to larger wave impacts and beach draw-down forces.

Chesil Beach has retreated north eastwards due to ongoing natural coastal processes for a long time (i.e. the Holocene or last 11,700 years). Increased storminess and sea level rise have exacerbated the rate of change and exposure. Sediment supply to the beach is now limited by coastal defences to the west and beach material can be lost offshore. These combined effects have progressively exposed more of the coast to wave attack and have left the most vulnerable southern half of the seawall protruding beyond the natural beach alignment and prone to further undermining and loss of support.

Left unchecked, this end of the seawall could fail and lead to damage to the rest of the structure and, ultimately, active coastal erosion, a loss of toe support and landsliding to resume at Chesil Cove.

It is feasible that the southern end of the seawall could fail in the next significant storm so that this part of the structure has no residual life.

The Geotechnical Desk Study (Appendix D) and slope stability assessment (see Annex A of Appendix D) show that the under present conditions the seawall is only marginally stable. Furthermore, although the stability of the slope isn’t reliant on the seawall and its foundations, this will become the case if foreshore scour and downwearing due to coastal erosion continues. The slope stability assessment also demonstrates that placement of the rock revetment in front of the seawall will both prevent foreshore erosion and provide support which will improve seawall stability.

A detailed account of coastal erosion and landsliding at the site are provided in Appendix C Coastal Processes Report and the Hazard model section of Appendix I Economic Report.

2.4.1. Table 1: number of properties at risk

Risk source & level	Residential properties	Non-residential properties
Coastal erosion		
Medium-term (until 2055)	25*	38
Long-term (until 2105)	51	38
*note these properties are predicted to be lost before the end of the epoch within the 20-year benefit period		

2.5. Impacts of climate change

The ongoing impact of climate change on sea level rise and storm power and frequency mean that the structure is experiencing increasingly larger wave impacts and beach draw-down forces. Beach and foreshore profile analysis indicates a general trend of erosion in front of the seawall.

In recent decades the impact of climate change on sea level rise and storm power and frequency mean that the structure is experiencing increasingly larger wave impacts and beach draw-down forces. Three of the storms in early 2014, for example, exceeded the 1 in 50 year return period intensity and since 2007, 12 individual storms have exceeded the 1 in 50 year Return Period. Waves during these storms exceeded 7 m in height (Jacobs, 2021).

Beach profile analysis indicates that in general beach levels are reducing in front of the seawall. This is corroborated by bathymetric surveys which show the clays foreshore and nearshore are also lowering. This will result in increased exposure of the sheet pile toe of the wall leading to undermining, and wall rotation.

The ongoing impact of climate change on sea level rise and storm power and frequency mean that the structure will increasingly be exposed to larger wave impacts and beach draw-down forces. The proposed scheme will reduce sea wall vulnerability to the impacts of climate change, and ensure a system that is adapted to future potential impacts.

2.6. Environmental and other considerations

An overview of the environmental designations is provided in Figure 4-1 of Appendix G and the Indicative Landscape Plan in Annex F of Appendix G.

An Environmental Statement will be required for the Scheme to present the results of a statutory EIA, which will accompany a full planning application and marine licence to Dorset Council Planning Authority and the Marine Management Organisation (MMO) respectively.

The seawall and surrounding area forms part of the Dorset & East Devon World Heritage Site (WHS), the Isle of Portland to Studland Cliffs SAC and the Chesil and the Fleet SAC. The fronting intertidal area is also designated as part of the Chesil Beach and Stennis Ledges MCZ and as part of the Chesil and the Fleet SAC.

A HRA Screening Report has been prepared which identifies likely significant impacts of the scheme on European sites, see Annex B of Appendix G and an Appropriate Assessment is required following further ecological survey work.

As the Scheme is located within the WHS, the impact of the proposed works on the WHS, including its setting will be assessed as part of the statutory EIA, in line with FCRM impact assessment guidance currently being developed by South West Flood & Coastal, utilising existing guidance and advice from UNESCO..

As part of the Scheme will be constructed within the MCZ, a MCZ risk assessment for the Chesil Beach and Stennis Ledges MCZ will be carried out to support the marine licence application that assesses the potential of the Scheme to affect qualifying intertidal and subtidal features, pink sea fan and native oyster, and any ecological or geomorphological processes on which these species are dependent on.

The development of this OBC has identified a number of relevant environmental issues, regulatory requirements, legal and other obligations, which need further consideration as the scheme progresses. Key areas for consideration are reported below:

- Designated geological and nature conservation sites;
- Water Framework Directive (WFD) requirements;
- Local community/tourism assets and access including Public Rights of Way;
- Ecological, e.g. protected species;
- Cultural/heritage;
- Landscape;
- Construction noise and traffic;
- Carbon.

To progress the above issues, the following documents were produced to support the Preliminary Environmental Information Report in Appendix G:

- Environmental Impact Assessment (EIA) Screening and Scoping Opinion (Annex A)
- Options Assessment Summary (Annex B);
- Habitat Regulations Assessment (HRA) Screening Report including Preliminary Ecological Appraisal (Annex C)
- Heritage Appraisal (Annex D);

- Water Framework Directive Assessment (Annex E);
- Indicative Landscape Plan (Annex F)

2.7. Risks, assumptions, constraints, dependencies and opportunities

2.7.1. Main risks

A risk register has been developed to identify and manage risks. The key risks with high priority associated with the delivery of the scheme are:

1. Early defence failure leads to works being more significant than planned
2. Unacceptable quality rock
3. Rock revetment settlement greater than expected
4. Increase in volume of beach material to be moved for construction of rock revetment
5. Underestimating volume of rock
6. Planning and licencing delays
7. Funding availability – Failure to secure agreed funding

The risk register has been used to inform the risk contingency for the scheme. The project risk register and Adjusted Optimism Bias register are in Appendices K and L.

As the project progresses the risk register will be developed to assign risks to the party best placed to manage it, and risks will be monitored and updated with regular risk workshops.

2.7.2. Constraints

A number of constraints need to be considered further during development of the scheme:

- Availability of and restrictions associated with partnership funding (FCRM GiA, Dorset Council)
- Working time restrictions in relation to local residents and businesses
- Tidal and sea state working restrictions
- International, national and local designated conservation sites that must be maintained and where possible, enhanced.
- Lyme Bay East coastal water body and associated Protected Areas, which are sensitive to change.
- Protected and notable habitats and species including invasive species, intertidal/subtidal habitats, fish, reptiles, invertebrates and botanical species.

- Setting of historic building assets.
- Tourism restrictions, e.g., limiting work to outside holiday period
- Road/footpath closures

2.7.3. Dependencies

To deliver the project investment objectives, the following internal and external dependencies have been considered and are being actively managed by the client team:

- Project approval/assurance
- Funding
- Legal agreements
- Licences, consents and orders

2.7.4. Opportunities

At detailed design stage opportunities for improved sustainability will be sought. A review of rock armour design including sources, size delivery methods and revetment dimensions will be examined. Once a contractor is appointed discussions regarding sustainable sourcing of materials, including steel sheet piles will be undertaken.

2.8. Objectives

This OBC has been produced to develop a scheme to improve the seawall at Chesil Cove to reduce the risk of coastal erosion and landslides to residential and commercial properties and other infrastructure within the impacted area. The investment objectives of the project are as follows:

- To maintain the seawall at the base of West Weares landslide system.
- Determine the most cost-effective level of protection for the next 100 years.
- Maintain the current defence line over the next 100 years.
- Assess the residual risks and identify options for management of these risks.

Minimise the scheme's environmental impact and determine opportunities to optimise the benefits to the local environment for people as well as for biodiversity.

3. Economic case

3.1. Introduction

The economic case seeks to summarise the methodology that has been used in carrying out the options appraisal. Critical success factors outline the requirements of the solutions considered and provide a set of criteria for the options to be measured against. The shortlisting process carefully considered the technical and environmental implications of each option.

The economic appraisal was undertaken in line with the Environment Agency's FCERM-AG, with damage calculations undertaken based on guidance in the Multi Coloured Manual 2017 (MCM) and supporting Multi-Coloured Handbook (2026).

3.2. Critical success factors

The primary objective of the scheme is to reduce the risk of coastal erosion undermining the sea wall at the base of the landslide system.

The critical success factors of the business case are set out below. The critical success factors are ranked by importance from 1 to 4 with 1 being the highest.

<u>Reduce risk of coastal erosion</u>

Measurement Criteria - Reduced risk of failure of seawall leading to coastal erosion will be managed by improving the condition of the asset and installing a rock revetment to dissipate wave energy.

Importance ranking = 1.

<u>Provide a sustainable coastal defence system that is affordable</u>

Measurement Criteria - Option cost including whole life cost and maintenance requirements which delivers the required level of protection. Record carbon reduction opportunities through the Carbon Calculator.

Importance ranking = 1.

<u>Community and key stakeholder engagement and involvement</u>

Measurement Criteria - To be measured by support and feedback provided by key local stakeholders. Community is to be aware of project programme and understand timescales.

Importance ranking = 2.

<u>Low level maintenance preferable</u>

Measurement Criteria – Technical assessment to detail which options have high or low maintenance.

Importance ranking = 4.

Ensure sustainable and environmentally neutral scheme

Measurement Criteria – Record carbon reduction opportunities through carbon calculator. Ensure no damage to adjacent designated sites.

Importance ranking = 3.

3.3. Long list options

This OBC builds on previous work including condition assessments and ground investigations, as well as the 2021 'Chesil Cove Coastal Defence Strategic Options Assessment' (Jacobs, 2021). This report assessed a long list of coastal defence options at Chesil Cove to manage long term (+50 years) coastal erosion which may result in potential failure of the seawall and consequences for landsliding.

The Long List options included –

- Option 1 – Full replacement of the seawall and rock revetment,
- Option 2 – Partial replacement of the seawall and rock revetment,
- Option 3 – Repair and strengthen (remediate) the current seawall and protect with a foreshore rock apron,
- Option 4 – Repair and strengthen (remediate) the current seawall and protect with a foreshore rock reef/terminal groyne,
- Option 5 – Repair, strengthen and improve the current seawall and protect with a rock revetment,
- Option 6 – Repair, strengthen and improve the current seawall (major refurbishment) and protect with an offshore breakwater.
- Option 7 – Sheet piled wall

The Jacobs 2021 report included an appraisal of options against key assessment criteria which allowed the options to be rated. Key criteria included high level costs, buildability, environmental and heritage impacts and carbon among others.

Based on the key criteria and information available at the time, the long list options assessment determined that Option 3, to repair and strengthen the current seawall and protect with a foreshore rock apron, was the most favourable option. Option 5, to repair and strengthen the current seawall and protect with a rock revetment, provides a good alternative along a similar approach to Option 3 and provided the next most favourable option.

Option 4 also offers a good alternative to Option 3 but scored lower due to known environmental constraints on offshore structures, high costs and the potential that the rock required on the seaward side of the reef will be larger than that available. If this is the case, more expensive and less favourable concrete armour units will have to be deployed.

The replacement seawall options (Options 1 and 2) scored least well. Option 6 also performed poorly due to very high costs and potential environmental showstopper triggered by a rock structure that is entirely offshore.

An additional Option 7 which includes the installation of a new sheet pile wall was also considered in the long list of options but this was dropped due to the likely increased beach scour over other options due to the reflective nature of a sheet pile wall, and the potential to cause geotechnical instabilities due to the required pile lengths which would interact with recorded deep seated shear surfaces within the landslide (see Appendix F, Annex A).

The full assessment of long list options is provided in the 2021 report included in Appendix A.

Additional information regarding the options, benefits and reasons for shortlisting and rejection is included within Appendix F – Options Report.

3.4. Short list options and technical assessment / appraisal

The Short listed options are as follows:

- Do Nothing
- Do Minimum
- Option 3A: Repair and Strengthen the Current Seawall and Protect with a Foreshore Rock Apron (40m extent, 2 layer 10-15 tonne rock).
- Option 3B: Repair and Strengthen the Current Seawall and Protect with a Foreshore Rock Apron (40m extent, 3 layer 10-15 tonne rock).
- Option 5A: Repair and Strengthen the Current Seawall and Protect with a Rock Revetment (1 in 3 slope with 10-15 tonne rock).
- Option 5B: Repair and Strengthen the Current Seawall and Protect with a Rock Revetment (1 in 6 slope with 3-6 tonne rock).

Options 3A, 3B, 5A and 5B are very similar, however the difference in slopes and use of geotextiles versus filter layer has an impact on the rock sizes and extent of the structures. This is discussed further in the technical appraisal in Section 3.3.

Technical Appraisal

This section contains a summary of the technical assessment options. The full assessment is available to read in Appendix F - Options Report and Appendix H – Details of Proposed Works.

Do Nothing

The ‘Do Nothing’ option assumes that there will be no further maintenance or repair to the seawall. Under the ‘Do Nothing’ scenario, failure of the seawall is likely to occur within a year.

With no further investment in the seawall, the condition will continue to deteriorate. Left unchecked the southern end of the seawall will quickly fail – it is feasible this could happen during the next significant storm so that this part of the structure has no residual life - and lead to damage to the rest of the structure and, ultimately, allow coastal erosion and shoreline retreat to resume.

The resumption of marine erosion would trigger a rapid destabilisation of slope behind, likely resulting in a reactivation of the whole of the existing landslide system in a relatively short time scale.

Under a Do Nothing scenario it is estimated 51 residential and 1 commercial property, as well as 37 beach huts and a basketball court would be lost. In addition, recommencement of the landslip will result in significant damage to a section of the A354 which would prevent access to the Portland peninsula. The Public Right of Way (PROW) which runs along the rear of the seawall would be disrupted and lost under this Do Nothing option.

The 'Do Nothing' option does not meet the objectives of the project and is included as a baseline option for appraisal only.

Do Minimum

The 'Do Minimum' option is a low-cost maintenance option providing limited risk reduction and benefits. It would consist of:

- An increase of rock at the toe of the structure,
- Patch and repair works to the sea wall; repairs to areas of concrete spalling or cracking.

The 'Do Minimum' option does not meet the objectives of the project and is included as a baseline option for appraisal only.

Option 3A - New sheet pile wall and repair with construction of large rock apron (2 layers)

Under the Do Something options (Options 3A, 3B, 5A and 5B), the seawall will be improved with the installation of a new steel sheet pile wall with capping beam along an 80m length of the seawall starting from the southern corner with a 15m section tying into high ground at the southern end and a length of 65m running along the front edge. The new sheet pile wall will be installed in front of the existing.

The capping beam along the remaining 65m length of seawall will be repaired and joint repairs will also be completed at the southern seawall and wing wall. The parapet and stairs constructed as part of the 2011 augmentation works would be removed as part of the scheme and the concrete parapet wall reconstructed.

Ongoing maintenance is included at ten yearly intervals for the 100 year appraisal period.

For option 3A, it is proposed that a rock apron formed of two layers of rock armour is constructed on the foreshore and beach fronting the seawall. The apron will provide wave attenuation and erosion protection to the existing seawall to prevent undermining.

The rock armour will be 10-15 tonne imported rock armour, overlying a filter layer and geotextile membrane. The rock armour would be installed along the existing foreshore and beach at a slope varying between 1 in 8 to 1 in 20 and will extend approximately 40m offshore.

A review of historical beach profiles indicates that wall protection is required in the short term along an 80m length of the southern seawall. It is proposed that the rock armour apron is extended north by 50m so that the entire seawall is protected within the next 20 years.

The large rock apron will dissipate wave energy and add weight to the toe of the landslide system to counter-balance the load/forces promoting landslide movement.

It is considered that this volume of rock could be delivered by road or marine. The steepness of the foreshore, and adverse sea state may make unloading from marine delivery difficult. Alternatively, if delivered by road, the large amount of rock would result in significant lorry movements through Chiswell resulting in temporary disturbance to local traffic routes and residents. Placement of the rock would need to be undertaken during low tides.

Option 3B - New sheet pile wall and repair with construction of large rock apron (3 layer toe)

Option 3B is the same as option 3A, except that three layers of rock will be placed from the toe of the apron to partway up the slope, where it ties in at a similar level to the two layers of rock. This option is considered to offer additional benefits by further increasing the weight to the toe of the landslide system to counter-balance the load/forces promoting landslide movement.

Option 5A - New sheet pile wall and repair with construction of rock revetment with filter layer (1 in 3 slope)

In option 5A, the proposed works to the seawall are as presented for Option 3A.

For this option, it is proposed that a rock revetment formed of two layers of rock armour overlaying a filter layer and geotextile is constructed on the foreshore and beach fronting the seawall. The rock revetment will provide erosion protection to the existing seawall to prevent undermining and dissipate wave energy. To provide protection to the steel sheet pile wall a core filter layer will be placed

against the sheet pile wall before the rock armour is laid. This will reduce wave action and abrasion to the sheet pile wall.

The rock revetment will comprise of 10-15 tonne imported rock armour, overlying a core armour of 0.3-1 tonne overlaying a geotextile. The shingle beach will be drawn back to expose the clay layer of the beach on which the rock revetment will be constructed. The rock armour revetment will be formed of a crest, 1 in 3 slope and toe. The rock armour revetment will be installed along an 80m length of the southern seawall. This will be extended within the next 20 years to complete the full length of the seawall.

The delivery of rock may be by road or marine.

Option 5B - New sheet pile wall and repair with construction of rock revetment with geotextile (1 in 6 slope)

This option is as 5A except that the rock revetment is constructed to a 1 in 6 slope. This reduces the size of rock required from 10-15 tonnes to 3-6 tonnes. This option extends approximately 40m from the seawall.

Choice of Materials

In the development of the short-listed options the size of the required rock armour was determined based on the use of imported rock armour. Imported rock armour (granite or limestone commercially available from France or Norway) has proven qualities for use in dynamic environments to provide a stable material for revetment construction. Due to the significant wave energy on this frontage, large rock armour of 10-15 tonnes is recommended using imported rock, except in Option 5B where the slope is shallower and 3-6 tonne rock is acceptable. The design condition adopted for the rock stability calculations was 0.5% Annual Exceedance probability with a 100 year design life.

The use of locally available Portland stone as rock armour was examined as part of option development. Portland stone is a less dense material than imported rock and therefore larger rock sizes would be required to meet an equivalent design criteria (See Appendix F Options Report for further detail). It was also noted that the compressive strength of Portland Stone is lower and water absorption higher than the imported rock materials which compromises the strength and durability of this material.

Despite these issues, it is acknowledged that the use of locally sourced Portland stone presents a more economic, sustainable and carbon efficient option. The use of this material will be further explored by Dorset Council during detailed design. Compromises on design criteria, and maintenance obligations may make the use of this material more viable.

3.5. Environmental assessment / appraisal

The OBC Preliminary Environmental Information Report (PEIR) assesses the environmental implications of the short-listed options outlined above in Annex B of Appendix G.

The PEIR and supporting annexes are included in Appendix G. The report describes the environmental issues, constraints and opportunities relating to the proposed scheme and identifies the scope of the statutory EIA required during detailed design.

An HRA Screening Assessment (assessment of likely significant effects) has been undertaken (see Annex C of Appendix G), which identifies likely significant effects on two European sites and that will require an Appropriate Assessment. Natural England has been consulted on the HRA Screening and agree the conclusions.

3.6. Costs

A full cost breakdown of constructing each of the short-listed options, has been appraised. In accordance with the FCERM-AG, costs are estimated over the 100 year appraisal period to derive a Present Value (PV) cost for each option.

The full cost breakdown for each option is provided in the Appendix I – Economic Assessment.

Mackley's have assisted in the production of the OBC by providing cost data for the sheet piling and specialised rock works, based upon their marine expertise. Additional costs have been produced through a detailed assessment of unit cost data from recent projects and consultant scheme experience. An allowance for consents and licences and detailed design costs are also included.

The costs for all works included in the economic appraisal of the options have a price base of 2026/27.

Risk has been considered to progress and construct the scheme. A risk register and adjusted Optimism Bias Calculator have been developed for the preferred option. Due to the similarity in construction approach and risks, these tools have been adopted for all short-listed options. The 50%ile risk budget from the Monte Carlo risk register has been combined with the % increase in cost from the OB register to provide a cost allowance for comparison at short list stage. This equates to approximately 27% for both Capital and Operation costs and PV Other costs.

3.7. Appraisal of opportunities, sustainability and carbon

Sustainability

At detailed design stage a review of rock armour design including sources, size delivery methods and revetment dimensions will be examined. Once a contractor is appointed discussions regarding sustainable sourcing of materials, including steel sheet piles will be undertaken.

Carbon Appraisal

During option development, a review of options for improvement to the seawall at Chesil Cove were considered. The preferred option looks to reduce the volume of rock used to ensure a lower carbon option.

Two alternative options have been examined for the preferred option 5A. Option 5A-1 considers rock delivery by barge to Southampton and then transportation to site by road. Portland Harbour has been discounted as it is likely that there would be insufficient quay space for unloading. Southampton has been used in the calculations as a conservative approach. The Contractor will decide on the transport arrangement, and this may differ from contractor to contractor. Option 5A-2 considers marine delivery of rock directly to Chesil Cove beach.

The results of the Carbon Planning Tools for all shortlisted options are summarised in Table below.

Option	Title	Capital Carbon Tonnes of CO^2	Operation Carbon Tonnes of CO^2	Net Carbon (incl. sinks) Tonnes of CO^2	Rank
3A	New sheet pile wall and repair with construction of large rock apron (2 layers)	6040	3	6087	3
3B	New sheet pile wall and repair with construction of large rock apron (3 layer toe)	7463	3	7513	4
5A-1 (rock via Southampton	New sheet pile wall and repair with construction	**3763**	**2**	**3804**	**2**

Option	Title	Capital Carbon Tonnes of CO^2	Operation Carbon Tonnes of CO^2	Net Carbon (incl. sinks) Tonnes of CO^2	Rank
and road delivery)	of rock revetment with filter layer (1 in 3 slope)				
5A-2 (rock direct to Chesil)		2545	2	2589	1
5B	New sheet pile wall and repair with construction of rock revetment with geotextile (1 in 6 slope)	3754	2	3797	2

Table 2. Carbon Cost – short-listed options

The Carbon Planning Tools together with the Carbon Appendix and Carbon Impacts Tool are included in Appendix N.

Further opportunities to reduce carbon to be explored at detailed design stage include –

- Capital carbon – optimising the size of the structures to reduce materials usage, reusing any existing structures or material onsite if possible, offsite manufacturing, confirming delivery approach.

3.8. Economic appraisal

The economic assessment of the short-listed options has been undertaken in accordance with the guidance given by Defra and the Environment Agency in the Flood and Coastal Erosion Risk Management Appraisal Guidance (Environment Agency, 2010) (FCERM-AG) and the Middlesex University Multi-Coloured Manual (MCM Handbook 2026). The base date for the assessment is 2026/27. Inflation has been applied to capital and other costs in 2027/28 and 2028/29.

A hazard model, available in Appendix I – Economic Assessment, was developed for the assessment of damages. The hazard model uses the site history and ground model to identify future failure scenarios from ongoing creep to widespread deep-seated failure to understand the likelihood, extent and scale of damage that could be caused. Damages are estimated probabilistically on an annual basis.

The most significant benefit of the scheme is prevention of disruption to the A354. The Isle of Portland is physically and visually separated from Weymouth, linked by a single carriageway road on the causeway adjacent to Chesil Beach and The Fleet. Although an entity in its own right, the Isle of Portland is made up of a group of villages, each with very distinctive features. The estimated population of the Isle of Portland is 12,840. Important interests on Portland include HMP Portland.

Further information is provided in Appendix I - Economics Report.

The Economic Summary of the Options Appraisal of short-listed options for the 100 year appraisal period is presented in Section 3.12, Table 4. The preferred option is identified based on the FCERM-AG decision process rules. Do Minimum has the highest BCR but the iBCR is greater than 1 and so the preferred option is Option 5A – New sheet pile wall and repair with construction of rock revetment with filter layer (1 in 3 slope).

3.9. Recommended preferred way forward or preferred option

Option 5A - New sheet pile wall and repair with construction of rock revetment with filter layer (1 in 3 slope)

This option meets the project objectives and CSFs and is the most economically preferred option to refurbish the Chesil Cove sea wall.

Seawall maintenance works will include the installation of a new steel sheet pile wall with capping beam along an 80m length of the seawall starting at 65m from the southern corner with a 15m section tying into high ground at the southern end. The new sheet pile wall will be installed in front of the existing sheet pile removing the need to demolish the existing.

The capping beam along the remaining 65m length of seawall will be repaired and joint repairs will also be completed at the southern seawall and wing wall. The parapet and stairs constructed as part of the 2011 augmentation works will be removed as part of the scheme and the concrete parapet wall reconstructed.

It is proposed that a rock revetment formed of two layers of rock armour overlaying a filter layer is constructed on the beach fronting the seawall. The filter layer will be placed over a geotextile separating the rock from the clay layer. Any shingle overlaying the clay will need to be moved for installation and will be redistributed in front of the seawall.

The rock armour will be 10-15 tonne imported rock armour, overlaying a filter layer of 0.3-1 tonne and geotextile. The rock armour would be installed at a slope of approximately 1 in 3.

The philosophy of this option is to protect the seawall with a rock revetment to dissipate wave energy and prevent erosion and undermining. This option has the

least encroachment impact onto the foreshore which minimises impacts on neighbouring frontages and environmental designations.

The rock revetment would extend approximately 26m from the base of the seawall encroaching into the Dorset & East Devon World Heritage Site, the Isle of Portland to Studland Cliffs Special Area of Conservation (SAC) and the Chesil and the Fleet SAC. The fronting intertidal area is also designated as part of the Chesil Beach and Stennis Ledges Marine Conservation Zone (MCZ) and as part of the Chesil and the Fleet SAC.

Over time it is likely that beach levels fronting the northern end of the structure will also lower. An allowance has been included to extend the rock revetment further north so that the entire seawall is protected within the next 20 years.

It is considered that this volume of rock could be delivered by road or marine. The steepness of the foreshore, and potentially choppy wave climate may make unloading from marine delivery difficult. Alternatively, if delivered by road, the large amount of rock would require delivery and storage at the Masonic carpark then transportation by tracked loader over the beach crest and along the beach to the seawall. Given the delivery vehicles will not have to pass through Chiswell it is anticipated that traffic disruption will be minimal and temporary. Placement of the rock would need to be undertaken at low tide.

The Details of the Proposed Works are included in Appendix H.

3.10. Value for money statement

This scheme is a refurbishment scheme as defined under the updated Flood and Coastal Erosion Risk Management Funding Policy March 2026. The proposed works will improve the condition of the primary flood defence asset - the Chesil Cove sea wall and extend the asset's life.

The sensitivity testing in Section 3.11 confirms the economic rigor of the economically preferred Option – 5A - New sheet pile wall and repair with construction of rock revetment with filter layer (1 in 3 slope), where Option 5A remains the preferred option in all scenarios.

To what extent does the proposal offer value for money and why has the value for money category been chosen?

The Defra Value for Money Statement states that for proposals with a positive Present Value Cost that Benefit Cost Ratio is the most appropriate Value for Money category to use for assessment.

The Benefit Cost Ratio for the 100 year appraisal period is 3.9, whilst when considered for the 20 year benefit period the Benefit Cost Ratio is 5.2. The guidance table shows that proposals with a Benefit Cost Ratio between 2.0-4.0 are considered of 'High' value and of over 4.0 of 'Very High' value.

The preferred option for Chesil Cove Sea Wall Improvements has positive Present Value Cost of £10,862k and a Benefit Cost Ratio of 3.9 for the 100 year appraisal period, and a positive Present Value Cost of £8,259k and a Benefit Cost Ratio of 5.2 for the 20 year benefit period.

The preferred option also has the highest Net Present Social Value of the options considered (£32,006k and £34,635k for the 100 year and 20 year periods respectively). However, Benefit Cost Ratio is the most appropriate decision criteria for this project according to the guidance.

What are the levels of confidence in the assessment and key impacts of the proposal?

Scheme present value costs for the 100 year appraisal period would have to rise by more than £11m in present value terms (from a current £10,861k present value) in order to reduce the Benefit Cost Ratio below 2 and drop the proposal into the next category of 'Medium' value for money. (For the 20 year benefit period, the present value costs would have to rise by more than £2.5m in present value terms from the current £8,258k) in order to reduce the Benefit Cost Ratio below 4.0 and drop the proposal into the next category of 'High' value for money.

It is highly unlikely that scheme costs would increase to this extent. The assessments of 'High' and 'Very High' values are therefore made with High Confidence using the "Very Likely" probability >85% category from the Value for Money framework due to use of priced options by potential supplier Mackleys.

The project is a significant stand-alone investment with an economic present value cost of £10,798k (100 year appraisal period cost) and a financial cash cost to the end of construction of £10,960k (including risk) (20 year benefit period cash cost).

Value for Money Summary

In addition to providing continued protection for residential and commercial property, as well as preventing reactivation on the landslide that could result in significant damage to the A354 – which would prevent access to the Isle of Portland peninsula, the scheme delivers on its investment objectives and contributes positively to the Environment Agency and Defra group Strategies. In summary, the scheme promoted in this Outline Business Case represents a 'Very High' value for money investment.

3.11. Sensitivity analysis

There are many variables used in the calculation of both costs and benefits associated with the Do Something options. A series of sensitivity tests have been undertaken to determine the relative impact that changes to the costs and damages would have on the status of the preferred option to ensure it is robust

under a variety of possible scenarios. Further details on the Sensitivity Tests are provided in Appendix I – Economics Report. The results are summarised below.

Sensitivity Test	Preferred Option	NPV (million)	BCR	iBCR
Baseline	Option 5A New Sheet Pile Wall and Repair with Construction of Rock Revetment with Filter Layer (1 in 3 slope).	32.0	3.9	3.9
Increase Capital costs by 20%	Option 5A New Sheet Pile Wall and Repair with Construction of Rock Revetment with Filter Layer (1 in 3 slope).	30.4	3.4	3.4
Delay in wall failure	Option 5A New Sheet Pile Wall and Repair with Construction of Rock Revetment with Filter Layer (1 in 3 slope).	26.6	3.1	2.8

Table 1.Summary of Economic Sensitivity Tests

3.12. Table 4: economic summary

(PV Costs include risk and optimism bias at 27%)

Option	Description	Whole Life Costs (PV £k)	Whole Life Benefits (PV £k)	Benefit Cost Ratio (BCR)	Incremental Benefit Cost Ratio (iBCR)
Option 1	Do Nothing	0	-	-	-
Option 2	Do Minimum	903	3,885	4.3	-
Option 5A	New sheet pile wall and repair with construction of rock revetment with filter layer (1 in 3 slope)	10,861	42,867	3.9	3.9
Option 5B	New sheet pile wall and repair with construction of rock revetment with geotextile (1 in 6 slope)	12,101	42,867	3.5	0.0
Option 3A	New sheet pile wall and repair with construction of large rock apron (2 layers)	17,836	42,867	2.4	0.0
Option 3B	New sheet pile wall and repair with construction of large rock apron (3 layer toe)	21,276	42,867	2.0	0.0

4. Commercial case

The commercial case details the procurement strategy for the project, together with details of risk allocation and project efficiencies. It demonstrates that the preferred option for coastal defence improvements has a viable route for procurement and that a structured plan is in place for delivery.

4.1. Procurement strategy

Dorset Council has significant recent experience with Public Contract Regulations and the Procurement Regulations; and will lead the procurement and tendering requirements. Delivering on procurement and tendering will rely on a mixture of internal and external resources. To meet operational, financial, social and administrative policies Dorset Council will achieve value for money and efficient corporate procurement of work, goods and services.

This project shares common characteristics and design similarities to several FCRM projects commissioned within the local area, both in its coastal environment and proposed defence structures. Embedding lessons learnt from these schemes will support this project in attaining the best quality and value design and construction.

Building on the project objectives, key drivers for the procurement of the scheme have been identified as follows:

- Professional and consulting service
- Early Contractor Involvement and buildability
- Construction
- Site investigations and surveys
- Public engagements and communications

Key drivers will be considered both individually and collectively to determine its optimal procurement options. Procurement options will be chosen on its efficiency to deliver on the project and its objectives. Previous experience has proved this approach to be very successful in delivering on projects.

This contracting approach involves the commission of a design supplier to undertake design independently and in advance of the commission of a construction supplier.

4.2. Procurement route and timescales

Following approval of the business case, Dorset Council will set out to procure the necessary services and construction work.

This OBC assumes a traditional route with detailed design preceding the construction delivery contract. However, this may vary depending on the scope of design work and scale of construction works. In turn, this will dictate the scope of works needed to complete the detailed design stage.

Post-OBC the project will be implemented in two sequential phases as discussed below:

- Phase I: April 2027 – December 2027
  This is the pre-construction, planning and detailed design stage and include site investigations, detailed design, ECI, statutory licensing and planning permissions.
- Phase II: December 2027 – June 2029
  This phase will include construction procurement and construction work itself.

4.2.1 Professional and Consulting Services

It is anticipated that development of the scope for future professional/consulting services will start in Dec 2026, with a view to commencing the post OBC work in Spring 2027.

Professional and consulting services will broadly include the following:

- Specialist technical, scientific and regulatory/legal advice
- Detailed design work and CRM
- Project management, construction contract development, and contract management

The necessary services will be scoped in detail before procurement and will be specific to the project and delivering on the objectives.

Professional services will be required for both of the implementation phases with specialist advice, detailed design and CRM part of the planning and detailed design phase. This phase will include Early Contractor Involvement on buildability and is anticipated to be needed by early 2027, to feed into detailed design. This phase will also include any consulting advice needed to prepare and/or submit the necessary applications for statutory and planning approvals/licenses.

Services pertaining to project management, construction contract development and contract management will be needed in the second, construction phase of the project. This phase is expected to start in Spring 2027 and construction completion reached in Summer 2029.

Dorset Council plan to retain Jacobs's services to support the delivery of this scheme post OBC. The council intends to procure Jacobs through the new Government Commercial Agency CPS2 Framework through a direct appointment. DC will procure the works via an exemption, or other suitable mechanism, as contemplated in the documentation approved for the appointment of the service provider for the OBC. If Jacobs are unavailable to support delivery as required, another suitable consultant will be appointed through a compliant route.

Direct appointment ensures that the most suitable supplier is appointed, providing (as will be set out for evaluation) a best value, high quality product. The

procurement method has been undertaken before and constitutes a compliant procurement route.

4.2.2 Early Contractor Involvement and Buildability

ECI will form part of the first phase and will bring construction expertise on board early in the design stage. Detailed construction experience will be fed into the design to inform quality, buildability, and the optimum programme of work early on.

A detail scope for ECI services will be developed and the service will be procured through existing frameworks used by the council. The choice of framework will fall to whichever is best placed to support delivery of the project objectives.

The frameworks available to this end are as follows:

- Government Commercial Agency (GCA)Highways Partnership Term Contract

4.2.3 Construction

Given the nature of the project, it is believed that the initial ECI contract should be extended to include construction phase. Significant risk avoidance can be achieved by having the ECI service provider delivering on construction as well.

The works will be delivered via NEC4 ECC which provides a legitimate delivery route and complies with public procurement regulations.

4.2.4 Site Investigations and surveys

Site investigations (SI) and surveys will form part of the first phase, and before detailed design is commenced the relevant ground investigations and surveys will be identified. They will precede or run concurrently to the detailed design process. Each will be scoped to ensure that it specifically supports delivery of the project objectives and addresses key uncertainties with the design and build.

As a key procurement driver, consisting of many individual elements, site investigations and surveys will be procured through a mix of frameworks, traditional invitation to quote processes as well as using Dorset Council in-house expertise.

4.2.5 Public Engagements and communications

Public engagements and communications will be conducted for the entire duration of the project. Dorset Coastal Forum has been providing the services on the business case and will continue to do so until completion of the project. They are a partner to Dorset Council and the council therefore has direct access to their services.

4.3. Contractual terms and risk allocation

The lead contracting and financial authority for the scheme is Dorset Council.

As a basic principle, risks will be contractually allocated to the party best placed to manage each risk. Risk allocation will be assessed at the point each contract is prepared between Dorset Council and each supplier to ensure the most appropriate allocation of risk.

Early Contractor Involvement during the initial stages of design will support a focus on risk reduction and management through the pre-construction stage to construction.

The New Engineering Contract (NEC) will be used for both consulting and contractor services. Dorset Council has replaced NEC3 with NEC4 as their preferred contract.

Professional services contract

Consulting services will be delivered through a call off contract from the Crown Commercial Framework, which uses the NEC4 Professional Services Contract.

Construction services contract

The construction services will be delivered under the terms of the NEC4 Engineering and Construction Contract. The preferred option for the construction services is to use an ECC Option C (Target contract with activity schedule).

Smaller procurements

For smaller procurement the council will make use of contracts specifically tailored to the nature of the procurement, and to the best delivery of project objectives. Dorset Council (DC) does so on a regular basis and has good understanding of the procurement and management of such contracts. These contracts are successfully delivered through the support of in-house legal capabilities. In the past those types of contracts consisted of the technical scope and specification along with special conditions pertaining the services being procured as well as general DC terms and conditions.

All risk shares will be set out in legal agreements, detailing how the Environment Agency, Dorset Council and other funding partners will share financial and other risks. The Project Board will approve contractor procurement agreements, any contract that exceeds £500,000 will also need Dorset Council cabinet approval.

The two stage approach provides high cost certainty and robust risk reduction prior to the signing of the contract. High confidence levels are provided to the suppliers through having adequate time to ensure the buildability of the final design and to undertake market testing of construction costs.

4.4. Efficiencies and commercial issues

The project will seek to generate efficiencies at each stage to ensure best value is achieved for the public purse. Projects arising from this OBC will develop a project efficiency register to record efficiency made and value added to the projects.

It is anticipated that, as the project progresses the following potential efficiencies can be made:

- Procurement of engineering services through existing commercial arrangements between engineering consultancies, suppliers and the council.
- Delivery phases including construction will retain the experience of the current consulting services on this project.
- The design of the promoted option will be reviewed as additional information becomes available so that opportunities for efficiencies can be identified and achieved through design.
- The contractor services brought in for ECI will be retained for the construction phase to ensure that a good technical understanding of the engineering solution and its challenges are retained intact.
- As part of option appraisal, an adaptive pathway was identified as a delivery mechanism on the project objectives. This will be investigated and considered during the design and planning stages.
- DCF is appointed as the stakeholder engagement manager to ensure that the project team can manage any emerging stakeholder issues as efficiently as possible.

An efficiency Combined Efficiencies Report Tool (CERT) for this OBC is included in Appendix P.

5. Financial case

5.1. Financial summary

Table 5 presents the financial summary for the preferred Option 5A - New Sheet Pile Wall and Repair with Construction of Rock Revetment with Filter Layer (1 in 3 slope). For the development of the OBC financial Case a 20 year benefit period is adopted.

Table 6 presents the project costs for approval. The Total Costs (for Approval) are £10,960k.

Mackley's have assisted in the production of the OBC by providing cost data for the sheet piling and specialised rock works, based upon their marine expertise. Additional costs have been produced through a detailed assessment of unit cost data from recent projects and consultant scheme experience. An allowance for consents and licences and detailed design costs are also included.

An additional allowance has been made to cover Environmental consents and licences and the requirements of meeting Biodiversity Net Gain obligations.

A Risk Register has been developed for the preferred option, (Appendix K). Monte Carlo risk analyses derived the 95% confidence limits included in the approval figures. An adjusted optimism bias allowance has also been applied.

A total contingency allowance made in the form of a risk allowance (95%ile) derived from the risk register which represents 27% (£1,838k) combined with an Adjusted optimism bias of 19% (£1,288k) provides a total risk allowance of £3,126k for the detailed design and construction stages (representing 43% of the approval value excluding sunk costs).

An allowance has been included to take into account inflation to costs/works carried out in financial years 2027/28, 2028/29 and 2029/30.

5.2. Funding sources

This project is seeking FCERM GiA funding to deliver the Chesil Cove Sea Wall Improvements refurbishment scheme. The works to the sea wall fulfil the definition of a refurbishment project as defined in the Capital Grant Eligible Investment Guidance (3 March 2026), where refurbishment is defined as:

"Activities mitigating for loss in asset design performance which are both:

- not manageable with asset maintenance activities
- significant and permanent if not addressed"

The benefit period has been taken as 20 years which is the period before the next investment when it is proposed that the rock revetment is extended further along the length of the seawall. This will allow the assets to be reassessed in 20 years time.

The seawall is located in the ward of Chiswell which is in the 0-20% most deprived areas in the UK.

All the funding for the scheme will be FCERM GiA. Future maintenance costs will be fully funded by Dorset Council.

5.2.1. Table 5: important financial details (20 year benefit period)

Detail	Total
Whole life cash cost (£k)	10,960
FCERM GIA (£k)	7,336
3rd party contributions:	
Dorset Council Funds (£k)	3,524
Local Levy (£k)	100

5.3. Funding prioritisation

It is understood the project prioritisation will depend on its 'return on government investment', which is calculated as the net present value of benefits (NPV B) divided by the grant in aid costs (G), as in the formula below.

Prioritisation = NPV B / G

The Net Present Value Benefits based on the 20 year benefit appraisal period is 3.3, based on a Net Present Value of Benefits of £34,635k.

5.4. Mitigating cost variation

Risks including but not limited to environmental conditions changing, changes in procurement, or needing more materials than planned have been considered. The key delivery risks of the project, with their proposed mitigation measures, are listed in project risk register in Appendix K.

5.5. Impact on resource and balance sheet (Environment Agency projects only)

Not Used

5.6. Overall affordability

Table 6 presents the combined whole life costs for the assets in the scheme assuming the 20-year benefit period. Total project cash costs of £10,960k are required to deliver such a scheme

5.7. Depreciation (Environment Agency-led projects only)

Not Used.

5.8. Table 6: financial summary (Cash Costs)

Annualised and itemised spend profile (cash, £k)	Pre-Yr 0	Yr 0 (this financial year) (2026/27)	Yr 1 (2027/28)	Yr 2 (2028/29)	Yr 3 (2029/30)	Yr 4+	Total
Costs to develop business case:							
• Internal costs	80	120					200
• External consultant fees	280						280
• Specialist fees and investigations							
Project delivery costs GW2:	360	120	0	0	0	0	480
Project approval costs:							
• Internal staff costs			108	198	36		342
• External consultant fees (inc. Cost Consultant, CDM)			682	70	43		794
• Construction Staff (ECC PM, Supervisor, Environmental Clerk of Works)				114	70		183
• Project implementation costs (construction)				3,119	1,926		5,045
• Environmental Enhancement (inc BNG)				564			564
• Environmental Mitigation				22			22
• Surveys and Investigations			107	5			112
• Consents and Licences			19				19
Risk (95th %ile + optimism bias)			375	1,806	945		3,126
Inflation (state % used in appendix)			25	147	99		271
Project delivery costs (total of above rows)	360	120	1,316	6,045	3,119	0	10,960
Future costs:							
• Maintenance						Covered by rev. cost	
• Future risk/optimism bias							
Project whole life costs (total of initial + future cost rows)	360	120	1,316	6,045	3,119	0	10,960
Funding sources:							
• Grant in Aid (capital)		0	921	4,231	2,183		7,336
• Grant in Aid (resource)							
• Council Capital Contributions	360	20	395	1,813	936		3,524
• Local Levy		100					100
Total Funding	360	120	1,316	6,045	3,119	0	10,960

6. Management case

6.1. Project management

The development of the OBC is being led by Dorset Council as the coastal erosion risk management authority responsible for coastal erosion under the Coast Protection Act 1949.

Governance and assurance arrangements are already in place for the project. Project governance consists of the Project Team, a Steering Group, Internal Special Advisors to the project as well as External Project Advisors to the project.

6.2. Project structure and governance

The Project Steering Group is chaired by Dorset Council's Service Manager FCERM.

The Senior Suppliers are Jacobs professional services consultants appointed to work alongside DC to deliver the OBC.

As the project progresses through the detailed design and construction phases it is expected that any appointed contractors for detailed design and scheme delivery will be added to the Senior Suppliers.

The Steering Group meets at regular intervals that coincide with key project milestones. The group can also call additional meetings as required.

6.2.1. Project roles and responsibilities

The governance structure is laid out below.

<u>Project Team</u>	
CRM Project Engineer:	Matthew Atyeo
Coastal Risk Manager:	Johan Venter
Consultant:	Jacobs
NEC4 PM:	TBC for Construction phase
Contractor:	TBC for Construction phase
Communication:	Dorset Coast Forum (Matthew Smith)
<u>Steering Group</u>	
Dorset Council:	Service Manager FCERM (Chair)
	Matthew Penny
	Finance – Paul Johnson
	Ecology – Nikki Taylor
	Greenspace – Russel Goff
	Highways – Ian Newport
	Technical Support – Mandy Stubbs
	World Heritage Planning – Sam Scriven

Environment Agency: Dave Picksley
Diamond McGill
Laura Lavery

Dorset Council internal special advisors

Rachel Baker: Communications Business Partner - Place
Marianne Lewis: Senior Procurement Officer- (Business Partner)Abigail Brooks: Senior Commercial Surveyor
Cass Worman: Senior Conservation Officer for Spatial Planning and Majors – Economy and Environment

Lara Altree: Senior Lawyer - Legal Services
Philip Crowther: Legal Advisor – Regulatory
Susan Hetherington: Engineer – Transport Development (Highways)
Marc Cutler: Traffic Team Leader (Highways)
Samantha Paulley: Senior Coordinator -Traffic (Highways)

6.3. Project plan

The key dates and milestones for the scheme are provided below.

6.3.1. Table 7: project stage summary

Project stage / gateway	Project stage description	Estimated Start date	Estimated End date	Responsible organisation	Budget required (£k)
Gateway 0	Strategic assessment	03/06/2023		Dorset Council	Refer to Table 6
Gateway 1	Business justification	24/04/2024		Dorset Council	
Gateway 2	Delivery strategy	Aug 2026	Dec 2026	Dorset Council	
Gateway 2	OBC Approval	Nov 2026	Dec 2026	Dorset Council	
	Detailed Design & EIA	Apr 2027	Nov 2027	Dorset Council	
	Licences & Approvals	Nov 2027	Mar 2028	Dorset Council	

	Contract Award (Notice to Proceed)	Mar 2028	Mar 2028	Dorset Council	
	Construction	Mar 2028	Jun 2029	Dorset Council	

The detailed project programme is available in Appendix M.

6.4. Engagement with stakeholders and compliance with Equality Act 2010

To ensure the smooth delivery of this project, consultation and engagement with key parties has been undertaken and will continue as the project progresses. Dorset Council have engaged with the following:

- Local community - three rounds of engagement with the local community on the problem at Chesil Cove, the potential solutions and the preferred option identified by the OBC. There was opposition amongst some users of the southern end of the seawall to options which might damage amenity by placing rock on the beach. Significant effort was put into easing these worries and to seek alternative solutions. Due to the need to armour the foreshore and beach to prevent erosion and downwearing which is undermining the seawall there are limited alternatives. However, reshaping of the rock apron and a sheet pile only options were added to the long list options appraisal. In addition, options to change the use of imported granite in the rock apron to local Portland Stone and a reshaping of the northern edge of the apron to recreate an area of sheltered sea access for swimmers will be taken forward for further consideration in detailed design. Continued engagement, with the local community will be necessary to inform residents and businesses of key activities being planned where any construction work may cause disruption to the local area.
- Natural England – through a meeting and subsequent correspondence, Natural England has confirmed that they have no objection in principle to the Scheme. A letter of support from Natural England is included in Appendix Q. Additionally, Natural England has been consulted on a Habitats Regulations Assessment (HRA) Screening Report prepared for the project (see Annex C of Appendix G) in accordance with The Conservation of Habitats and Species Regulations 2017 (as amended) and the Offshore Marine Conservation (Natural Habitats & c.) (Amendment) Regulations 2010 (the ‘Habitats Regulations’). The project

team will continue to work closely with Natural England throughout the next stage of works.

- Consenting authorities - in accordance with the Town and Country Planning (EIA) Regulations 2017 (as amended) and Marine Works (EIA) Regulations 2007, a formal EIA Screening and Scoping Opinion was requested from Dorset Council Planning Authority and the MMO. Under the Coastal Concordat, the MMO (as lead authority) coordinated an EIA Screening and Scoping Opinion (see Annex A of Appendix G). Further engagement has been undertaken with Dorset Council Planning Authority regarding the Scheme.
- Other stakeholders included:
    - Dorset Council Ecologist
    - Environment Agency
    - Jurassic Coast Trust (it should be noted that the Jurassic Coast Trust was closed in 2025 and Dorset Council has taken on responsibility to deliver the Management Plan)
    - Environment Agency
    - Portland Town Council
    - Portland Underhill to Wyke Regis Coastal Strategy Study Team
    - Crown Estates
    - Quiddles Café
    - Cove House Inn

6.5. Benefits, outcomes and change management

The proposed investments aim to extend the life of the Chesil Cove seawall to 100 years, to continue to prevent the reactivation of the West Weares landslide that would result in loss of 51 residential properties, 39 non-residential assets, and the A354.

Benefit	**Specific targets and/or scope**
Technical, Innovation, Health and Safety	
Maximise health and safety in construction and operation	• Repair existing seawall instead of replacement. • Proposed rock revetment offers sustainable, low maintenance option.
Maximise opportunities for innovation	• Solution is fully adaptable to climate change.
Sustainability	• Solution is fully adaptable to climate change.

	• Helping the community economically as continued stability of the landslide and A354 will support future development and tourism
Economic and Other Monetised Benefits	• A354 and main transport link to Portland better protected • 51 residential properties better protected • 39 non-residential assets better protected • Overall economic benefits of £39 million (OM1A)
Other (including environmental) Benefits	• Protection of coastal frontage and reduced erosion risk to people and the environment in the hinterland of the defences including properties, beach huts, local road, leisure, sea bathers, community and recreational facilities • Increased confidence in local investment for development, businesses and economic growth.

Table 8.Benefit Summary

6.5.1. Table 9: carbon benefit summary

The Carbon Calculator has been completed as part of the assessment (Appendix N). Table 9 shows the carbon assessment summary for the preferred option – Option 5A-1 that considers rock delivery by barge to Southampton and then transportation to site by road.

	Forecast (tCO_2e)	**Target [1] [2] (tCO_2e)**	**Forecast / Target (%)**	**Current Authorised Budget (tCO_2e)**	**Previous Authorised Budget (tCO_2e)**
Capital Carbon	3872	669.29		*Environment Agency-led projects only*	*Environment Agency-led projects only*
Operational Carbon	39				
Net Carbon [3]	3804				

Notes

1 Target for EA led projects is the Capital Carbon Budget from EA Carbon Assessment Tools and AIMS:PD for Operational Carbon.

2 Target for RMA projects will relate to the partners' own target measures. Where these are not available, use the indicative figures provided in AIMS:PD.

3 Net Carbon = Whole-life Carbon Value – Any Sequestration – Carbon Avoided (Carbon Impacts Tool)

6.6. Risk management

A risk register has been developed to identify and manage risks. The key risks with high priority associated with the delivery of the scheme are:

1. Early defence failure leads to works being more significant than planned
2. Unacceptable quality rock
3. Rock revetment settlement greater than expected
4. Increase in volume of beach material to be moved for construction of rock revetment
5. Underestimating volume of rock
6. Planning and licencing delays
7. Funding availability – Failure to secure agreed funding
8.

The risk register has been used to inform the risk contingency for the scheme. The project risk register and Adjusted Optimism Bias register are in Appendices K and L.

As the project progresses the risk register will be developed to assign risks to the party best placed to manage it, and risks will be monitored and updated with regular risk workshops.

Assumptions

The quantities of rock are based on an assumption in respect to the location of the clay layer on the beach. Confirmation will be sought on site in autumn 2026.

It has been assumed that no geotechnical survey will be required at detailed design stage to inform the construction of the seawall or rock revetment but it may be required to reduce design conservatism.

Issues

If failure of a defence should occur ahead of scheme implementation, any emergency works required will consider the outline design for the failure location. The works undertaken will endeavour to implement the proposed solution or utilise materials which can be reused in the final scheme, such as rock.

Dependencies

The business case for the scheme is dependent on provision of a contribution to be provided by Dorset Council. Once the contribution is approved and subject to OBC approval, funds can be drawn down to progress detailed design and construction.

6.7. Contract management

Contract Management is set out in the Commercial Case Section 4.

6.8. Assurance

This is a simple change appraisal type project, which will be assured in line with the Environment Agency's Integrated Assurance and Approval Strategy (IAAS).

Large Projects Review Group (LPRG)/National Project Assurance Service (NPAS) will review the project OBC as it completes the Outline Design Stage and ahead of detailed design and construction.

Dorset Council Cabinet Approval will also be sought.

The scheme will require planning approval and a Marine Licence. Applications will be made during the detailed design stage.

6.9. Post project evaluation

Not Used

6.10. Contingency plans

Not Used

7. List of appendices **(excluded from Cabinet Report, available upon request)**

A	Chesil Cove Coastal Defence Strategic Options Assessment 2021
B	Chesil Cove Seawall Inspection 2023
C	Coastal Processes Report
D	Geotechnical Desk Study
E	Photographs
F	Options Report
G	Preliminary Environmental Information Report
	Annex A - EIA Screening Scoping Opinion
	Annex B - Option Assessment
	Annex C - HRA Screening Report including Preliminary Ecological Appraisal
	Annex D - Heritage Appraisal
	Annex E - Water Framework Directive Assessment
	Annex F - Indicative Landscape Plan
H	Details of Proposed Works
I	Economics Report
J	Not Used
K	Project Risk Register
L	Adjusted Optimism Bias
M	Programme
N	Carbon
O	Not Used
P	Efficiency
Q	Natural England Letter

Appendix A – Confirmation and details of consultation

Names of important consultees (for example, Finance Business Partner, NEAS, NE, Commercial, Legal etc.)		
Name **and** job title	Date	Important outcomes from consultation

I confirm that the documentation is ready for submission to Assurance/Budget Holder (delete as appropriate).

I, as Project Executive, have ensured that relevant parties have been consulted in the development of this project and the production of this document in particular the Project Sponsor and Senior User.

Name	
Job Title	
Emailed approval	
Date	

Paste the full email from the Project Executive here.