

NOTICE OF MEETING

Meeting: CABINET

Date and Time: WEDNESDAY, 4 SEPTEMBER 2024, AT 10.00 AM

Place: COUNCIL CHAMBER - APPLETREE COURT, BEAULIEU ROAD, LYNDHURST, SO43 7PA

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PUBLIC INFORMATION:

This agenda can be viewed online (<https://democracy.newforest.gov.uk>). It can also be made available on audio tape, in Braille and large print.

Members of the public are welcome to attend this meeting. The seating capacity of our Council Chamber public gallery is limited under fire regulations to 22.

Members of the public can watch this meeting live, or the subsequent recording, on the [Council's website](#). Live-streaming and recording of meetings is not a statutory requirement and whilst every endeavour will be made to broadcast our meetings, this cannot be guaranteed. Recordings remain available to view for a minimum of 12 months.

PUBLIC PARTICIPATION:

Members of the public may speak in accordance with the Council's [public participation scheme](#):

- (a) on items within the Cabinet's terms of reference which are not on the public agenda; and/or
- (b) on individual items on the public agenda, when the Chairman calls that item. Speeches may not exceed three minutes.

Anyone wishing to attend the meeting, or speak in accordance with the Council's public participation scheme, should contact the name and number shown above no later than 12.00 noon on Friday, 30 August 2024.

Kate Ryan
Chief Executive

Appletree Court, Lyndhurst, Hampshire. SO43 7PA
www.newforest.gov.uk

AGENDA

Apologies

1. MINUTES

To confirm the minutes of the meeting held on 7 August 2024 as a correct record.

2. DECLARATIONS OF INTEREST

To note any declarations of interest made by members in connection with an agenda item. The nature of the interest must also be specified.

Members are asked to discuss any possible interests with Democratic Services prior to the meeting.

3. PUBLIC PARTICIPATION

To receive any public participation in accordance with the Council's public participation scheme.

4. FINANCIAL MONITORING REPORT (BASED ON PERFORMANCE APRIL - JUNE 2024 INCLUSIVE) (Pages 3 - 16)

5. CUSTOMER STRATEGY REPORT (Pages 17 - 42)

6. CHRISTCHURCH BAY & HARBOUR FLOOD & COASTAL EROSION RISK MANAGEMENT (FCERM) STRATEGY (Pages 43 - 210)

7. STRATEGIC RISK REGISTER (Pages 211 - 230)

8. MEETING DATES

To agree the following dates of meetings for 2025/2026 (Wednesdays at 10:00am)

2025

7 May (already agreed)
4 June
2 July
6 August
3 September
1 October
5 November
3 December

2026

4 February
18 February
4 March
1 April
6 May

To:

Councillors

Jill Cleary (Chairman)
Steve Davies (Vice-Chairman)
Geoffrey Blunden

Councillors

Jeremy Heron
Dan Poole
Derek Tipp

Cabinet – 4 September 2024

Financial Monitoring Report (based on Performance April to June 2024 inclusive)

Purpose	For Decision
Classification	Public
Executive Summary	<p>This report provides the latest budget forecasts for the General Fund, Housing Revenue Account (HRA) and capital programme for the 2024/25 financial year, based on quarter one performance from April 2024 to June 2024 inclusive.</p> <p>It confirms a balanced budget is forecast in the General Fund. A forecast deficit in HRA currently of £122k to be managed and mitigated throughout the remainder of the financial year and an increase in the capital programme for 2024/25 of £3.454m predominately due to the rephasing of 2023/24 activity into 2024/25.</p>
Recommendation(s)	<p>It is recommended that Cabinet:</p> <ol style="list-style-type: none"> 1) note the latest budget forecasts of the General Fund, HRA, and Capital. 2) approve supplementary budgets of £50,000 in the General Fund and £90,000 in the Housing Revenue Account for additional trees maintenance costs. 3) approve supplementary budget provision of £125,000 for additional operating costs of the Green Waste service, funded from additional income from the Green Waste service.
Reasons for recommendation(s)	<p>To comply with accounting codes of practice and best practice which requires councils to regularly monitor the annual budget position and take any action to support the sustainability of the council's financial position ensuring we are being financially responsible.</p>

	To comply with the council's financial regulations regarding budget virements and supplementary budget requests.
Ward(s)	All
Portfolio Holder(s)	Councillor Jeremy Heron - Finance and Corporate
Strategic Director(s)	Alan Bethune - Strategic Director Corporate Resources and Transformation (Section 151 Officer)
Officer Contact	Paul Whittles Assistant Director - Finance 02380 285766 paul.whittles@nfdc.gov.uk

Introduction and background

1. Following the approval of the Original Budget for 2024/25 in February 2024, this report provides an update on the General Fund, Housing Revenue Account and Capital budgets, adjusting for any budget changes now required and recommended.
2. Financial Monitoring is an important feature in the management of the council's finances as it gives an opportunity to reflect on variations as against the latest set budget and reflect on the impact that these variations may have over the period covered by the council's Medium Term Financial Plan (MTFP).

Pay award implications

3. The 2024/25 pay award for Chief Officers (Strategic Directors) has been agreed at 2.5% but other agreements have still not been reached. Currently, a ballot on potential industrial action is being carried out by one of the three unions represented at the council, indicating a ballot result in October and therefore agreement is likely to still be several months away.

General Fund revised projection

4. A General Fund budget of £24.513 million for 2024/25 was agreed by council in February 2024 (£24.898 million at Portfolio analysis level, with other budget elements reducing this to this lower General Fund budget figure).

5. The latest budget variations reported include net unfavourable expenditure variations of £371,000, net income increases of £375,000 and additional grant income of £36,000. Furthermore, expenditure projects totalling £805,000 have been rephased from 2023/24 and £228,000 additional income received in 2023/24 rephased to be spent in future years. Major variations are detailed below (ordered in accordance with Appendix 1), with full variations listed in Appendix 2.
6. Rephasing budgets between years are summarised below:

	£'000
Community, Safety and Wellbeing	
Grants	25
CCTV - Expansion	85
Environment and Sustainability	
Cemeteries - Maintenance	29
Waste – Posts from Corporate Plan Priorities	153
Finance and Corporate	
Salisbury Road, Totton	140
Leader	
UKSPF Schemes	112
Planning and Economy	
Policy - Digital Planning Grant	100
Economic Development – Initiatives budget	34
Portfolio adjustments – Non-Direct	
AMR Scheme - North Wing Appletree Court	34
AMR Scheme - East Wing Appletree Court	93
TOTAL FROM 2023/24	805
Housing and Homelessness	
Homes for Ukraine Grant (para 15)	-228
TOTAL INTO FUTURE YEARS	-228
NET REPHASINGS INTO 2024/25	577

Community, Safety and Wellbeing (Housing and Communities)

7. **Health and Leisure Centres (-£127,000)** – Funding of £127,000 originally allocated to maintenance projects at the health and leisure centres has been vired to supplement the budget for the Appletree Court East Wing Roof scheme. Sufficient funds remain in the enhanced Health and Leisure Centre budgets to meet expected maintenance needs. (See Finance and Corporate Portfolio and Housing Revenue Account).

Environment and Sustainability (Place, Operations and Sustainability)

8. **Open Spaces – Trees (£50,000)** – NFDC’s contract for arboricultural services was subject to a retendering exercise that completed in Q4 of 2023/24. The rates now in place with the successful providers (x2) are higher than those originally budgeted for 2024/25. Tree works are carried out following inspection by one of the council’s Corporate Tree Officers, and expenditure levels are generally difficult to predict and can also be affected by storm events. A £50,000 budget pressure has been estimated based on the increase in rates and an expected level of required works based on previous years. This represents an increase on the original budget of 42%.
9. **Recycling – Glass Income (-£150,000)** – glass collected from residents and businesses is passed to our recycling contractor Veolia, who pass income from the sale of glass back to Hampshire’s Waste Collection Authorities. The price secured for the period up to February 2025 is higher than forecast, leading to £200,000 higher than expected income. £50,000 of this income has been used to provide additional temporary administration support to teams involved in rolling out the new Bartec ICT system designed to improve back-office and customer facing ICT relating to waste, street scene and grounds maintenance services.
10. **Recycling – Garden Waste (-£50,000)** – the new garden waste service now has over 23,000 customers, which is an increase on customer numbers using the previous sack-based service. The service growth in July alone was an additional 400 customers. This is estimated to deliver additional income of around £175,000 but does also require further investment of £125,000 in collection resources, including staff and vehicle hire costs. Operational teams are devising a longer-term proposal for the resource required for these increasing customer numbers.

11. **Sustainability - (£150,000)** - Funding of £250,000 was originally allocated within the capital programme for Sustainability projects. Some spend will be classified as revenue, and consequently an adjustment between the Capital Programme and Revenue account is required. This has no impact on the overall council financial resources.

Finance and Corporate (Corporate Resources and Transformation)

12. There are no variations that impact directly on the reported Finance and Corporate Portfolio summary but other variations under the control of the Portfolio holder which impact all Portfolios or other General Fund budgets are:
13. **Grants (-£36,000)** – The council has received higher than anticipated Guarantee Grant of £33,000 and Services Grant of £3,000.
14. **Appletree Court East Wing Roof Repairs (£95,000)** – Additional expenditure requirements of £127,000 on the roof repairs are to be funded by the virement of budget from the Health and Leisure Centres Asset Maintenance Programme. See Community, Safety and Wellbeing Portfolio. £95,000 of this expenditure will impact the General Fund and £32,000 the Housing Revenue Account.

Housing and Homelessness (Housing and Communities)

15. **Homeless Assistance (-£228,000)** – The council has received additional revenue funding grant of £228,000 to assist Ukrainian Families. It is currently anticipated that the existing expenditure budget this year of £314,000, including staffing costs, will be sufficient in meeting all our requirements in providing this support, and therefore the additional funding received will initially be carried forward to be utilised next financial year. The position will continue to be monitored throughout the year.
16. The overall impact of all variations results is an updated General Fund Budget of £24.509 million; a reduction of £4,000 from the original estimate. In addition, there is additional Government Grant of £36,000.
17. The revised General Fund Budget for 2024/25 can be seen at Appendix 1, with further details on the variations being reported included within Appendix 2.

Other Financial Issues

18. **Car Parking** – Based on income received to date the annual car parking income is forecast to be £4.8m compared to a budgeted expectation of £5m. This budget will be closely monitored throughout the year and reviewed again once pricing decisions, effective from January 2025, are made.
19. **Development Management** – Income is currently £118,000 below profiled budget but this is partially offset by £60,000 staffing vacancy savings. No adjustment to the budget is being proposed at this time, but the budgets will be closely monitored and reviewed later through the year.

Housing Revenue Account Revised Projection

20. A break-even HRA budget for 2024/25 was agreed in February 2024, with a Revenue Account contribution of £9.700 million supporting the financing of the £32.380 million HRA Capital Programme.
21. This report identifies net budget increases of £183,000 with £61,000 being funded from reserves from schemes rephased from 2023/24. Work will continue over the remainder of the year to mitigate the net overspend. New variations are detailed in the following paragraphs and summarised in Appendix 3.
22. **General Management - (£93,000)** – The Housing Revenue Account contribution towards the additional Appletree Court North and East Wing Roof works is £74,000 but £42,000 of this is funded from reserves for items rephased from 2023/24. In addition, £19,000 has been rephased from 2023/24 relating to Tenants Charter costs.
23. **Grounds Maintenance and Trees - (£90,000)** – Following a retender of the Grounds Maintenance contract costs are anticipated to increase by £90,000 (see para 8).
24. The updated HRA budget can be seen at Appendix 3.

Capital Expenditure (General Fund and Housing Revenue Account)

25. A Capital Programme budget of £48.959 million for 2024/25 was agreed by council in February 2024.
26. The latest forecast confirms gross programme changes totalling £225,000 and net rephasing into 2024/25 of £3.229 million which

results in an updated 2024/25 Capital Programme Budget of £52.413 million (Appendix 4).

27. Details of the changes and rephasing are provided below:
28. **Environment and Sustainability** – St Georges Hall Calshot – New expenditure of £375,000 has been allocated to refurbish St Georges Hall. This is to be funded by £214,000 from the Contain Outbreak Management Reserve and £161,000 from the Rural England Prosperity Fund.
29. **Environment and Sustainability** – As detailed in paragraph 11, £150,000 of resources for Sustainability projects has been transferred to the revenue budget.
30. Rephasing £3.229 million from 2023/24 added to 2024/25:

	£'000
Leader	
UK Shared Prosperity Fund	22
Rural England Prosperity Fund	231
Environment and Sustainability	
Strategic Regional Coastal Monitoring	258
Barton Drilling Trials	53
Waste Strategy Containers	63
Finance and Corporate	
New Depot Site: Hardley	1,602
Vehicles and Plant; Replacement Programme	1,000
REPHASINGS FROM 2023/24	3,229

Corporate plan priorities

31. Regular monitoring and reporting of our financial activity including adjusting budgets whilst maintaining a balanced medium term financial plan (MTFP), ensures we are being financially responsible and supports our Future New Forest transformation programme which underpins the delivery of all our priorities.

Options appraisal

32. No realistic alternative options are available, not approving the supplementary budget regarding tree works would mean the

services have an inability to maintain service levels under the new higher priced contract. Similarly, not investing in the waste service will negatively impact delivering the service with its increased demand. Thereby not meeting the expectations of customers which in turn would put at risk ongoing future revenue streams.

Consultation undertaken

33. Internal consultation between finance officers, service managers and budget holders has determined the forecast data presented in the report.

Financial and resource implications

34. This is a financial report with budget implications already detailed and considered in the main body of the report.

Legal implications

35. There are no legal implications arising directly from this report.

Risk assessment

36. The projected forecast is prepared based on estimates and assumptions in consultation with services. There are key risks in the projections across all service areas and both revenue and capital activity.

Environmental / Climate and nature implications

37. There are no environmental implications arising directly from this report.

Equalities implications

38. There are no equality implications arising directly from this report.

Crime and disorder implications

39. There are no crime and disorder implications arising directly from this report.

Data protection / Information governance / ICT implications

40. There are no data protection, information governance or ICT implications arising directly from this report.

Appendices:

Appendix 1 – Revised General Fund Budget 2024/25

Background Papers:

Cabinet 21 February 2024 – Budget Reports 24/25

Appendix 2 – Variation Analysis
General Fund 2024/25

Appendix 3 – Revised Housing
Revenue Account Budget 2024/25

Appendix 4 – Revised Capital
Programme 2024/25

Housing Revenue Account Budget
and the Housing Public Sector
Capital Expenditure Programme
2024/25

Medium Term Financial Plan and
Annual Budget 2024/25

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FINANCIAL MONITORING 2024/25

REVISED GENERAL FUND BUDGET 2024/25

	Feb-24 2024/25 £'000's Original Budget	September-24			2024/25 £'000's Latest Budget
		2024/25 £'000's New Variations Expend.	2024/25 £'000's New Variations Income	2024/25 £'000's New Variations Rephasings	
PORTFOLIO REQUIREMENTS					
Community, Safety and Wellbeing	3,468	-127	0	110	3,451
Environment and Sustainability	8,540	375	-375	182	8,722
Finance and Corporate	4,220	0	0	140	4,360
Housing and Homelessness	3,499	0	0	-228	3,271
Leader	1,174	0	0	112	1,286
Planning and Economy	3,997	0	0	134	4,131
Multi Portfolio adjustments - To be allocated	0	95	0	127	222
	24,898	343	-375	577	25,443
Reversal of Depreciation	-2,190				-2,190
Contribution (from) / to Earmarked Revenue Reserves	-410	28	0	-577	-959
NET PORTFOLIO REQUIREMENTS	22,298	371	-375	0	22,294
Minimum Revenue Provision	2,269				2,269
Contribution to Capital Programme Financing (RCCO)	1,250				1,250
Interest Costs	150				150
Interest Earnings	-1,432				-1,432
New Homes Bonus	-22				-22
GENERAL FUND NET BUDGET REQUIREMENTS	24,513	371	-375	0	24,509
COUNCIL TAX CALCULATION					
Budget Requirement	24,513	371	-375	0	24,509
Less: Settlement Funding Assessment					
Lower Tier Service Grant	0				0
Services Grant	-25		-3		-28
Guarantee Grant (MHCLG)	-1,200		-33		-1,233
Business Rates Baseline	-4,330				-4,330
	-5,555	0	-36	0	-5,591
Locally Retained Business Rates	-4,320				-4,320
Estimated Collection Fund (Surplus)/Deficit Business Rates	1,305				1,305
Contribution from Business Rates Equalisation Reserve	-1,305				-1,305
Estimated Collection Fund (Surplus)/Deficit Council Tax	-179				-179
Contribution to/ from(-) Variation Reserves	0	-371	411	0	40
COUNCIL TAX	14,459	0	0	0	14,459
TAX BASE NUMBER OF PROPERTIES	72,371.50				72,371.50
COUNCIL TAX PER BAND D PROPERTY	199.79				199.79
GENERAL FUND BALANCE 31 MARCH	3,000				3,000

FINANCIAL MONITORING 2024/25

VARIATION ANALYSIS GENERAL FUND 2024/25

PORTFOLIO ADJUSTMENTS

Community, Safety and Wellbeing

Grants - Rephased into 24/25

CCTV - Rephased into 24/25 (Proposed spend from £284k in reserve)

Health and Leisure Centres AMR funding wired to ATC East Wing Roof

Environment and Sustainability

Cemeteries - Maintenance budget rephased into 24/25

Climate and Nature Action - spend relates to Revenue not Capital

Open Spaces - projected Trees overspend

Recycling - additional Glass sales income - partially used to fund temporary posts

Recycling - additional Garden Waste income, partially offset by new round costs

Waste Strategy - Temporary posts met from Corporate Plan Priorities

Finance and Corporate

Sustainability and Regen. Assets - Salisbury Road, Totton Scheme. Rephased into 24/25

Housing and Homelessness

Homeless Assistance - Homes for Ukraine Grant

Leader

Prosperity Funds - UKSPF Schemes - Rephased into 2024/25

Planning and Economy

Policy - Digital Planning Grant (DLUHC) - rephased into 24/25

Economic Development - Initiatives budget rephased into 24/25

Portfolio adjustments - Non Direct

AMR Scheme - North Wing Appletree Court. Rephased into 24/25

AMR Scheme - East Wing Appletree Court. Rephased into 24/25

AMR Scheme - East Wing Appletree Court, virement from Comm. Safety and Wellbeing

TOTAL PORTFOLIO ADJUSTMENTS

NON-PORTFOLIO ADJUSTMENTS

Central Government Grants

Contribution to/from(-) Earmarked Reserves

TOTAL NON-PORTFOLIO ADJUSTMENTS

GRAND TOTAL ADJUSTMENTS (Credited to (-) / Debited from (+) Budget Reserves)

2024/25 £'000's	September-24			2024/25 £'000's
	2024/25 £'000's	2024/25 £'000's	2024/25 £'000's	
New Variations Expend.	New Variations Income	New Variations Rephasings	Latest Budget	
			25	
			85	
-127				
-127	0	110		-17
			29	
150				
50				
50	-200			
125	-175			
			153	
375	-375	182		182
			140	
0	0	140		140
			-228	
0	0	-228		-228
			112	
0	0	112		112
			100	
			34	
0	0	134		134
			34	
			93	
95				
95	0	127		222
343	-375	577		545
			-36	
28		-577		
28	-36	-577		-585
371	-411	0		-40

FINANCIAL MONITORING 2024/25

REVISED HOUSING REVENUE ACCOUNT BUDGET

2024/25

Feb-24

2024/25

£'000's

Original

Budget

September-24

2024/25

£'000's

New

Variations

2024/25

£'000's

Latest

Budget

INCOME

Dwelling Rents	-33,396		-33,396
Non Dwelling Rents	-775		-775
Charges for Services & Facilities	-1,169		-1,169
Contributions towards Expenditure	-60		-60
Interest Receivable	-441		-441
Sales Administration Recharge	-33		-33
Shared Amenities Contribution	-313		-313

TOTAL INCOME**-36,187****0****-36,187****EXPENDITURE****Repairs & Maintenance**

Cyclical Maintenance	1,886		1,886
Reactive Maintenance - General	3,400		3,400
Reactive Maintenance - Voids	1,521		1,521

Supervision & Management

General Management	7,766	93	7,859
Grounds Maintenance and Trees	936	90	1,026
Older Person and Temporary Accommodation	1,150		1,150

Rents, Rates, Taxes and Other Charges

0

0

Provision for Bad Debt

150

150

Capital Financing Costs - Interest/Debt Management

5,137

5,137

Capital Financing Costs - Internal Borrowing

0

0

TOTAL EXPENDITURE**21,946****183****22,129****HRA OPERATING SURPLUS(-)****-14,241****183****-14,058****Contribution to Capital - supporting Housing Strategy**

9,700

9,700

Capital Financing Costs - Principal

4,541

4,541

HRA Total Annual Surplus(-) / Deficit**0****183****183****Contribution to/from(-) Earmarked Reserves****-61****-61****HRA TOTAL ANNUAL SURPLUS(-) / DEFICIT****0****122****122**

FINANCIAL MONITORING 2024/25

REVISED CAPITAL PROGRAMME 2024/25

	Portfolio	Feb-24	September-24		
		2024/25 £'000's Original Budget	2024/25 £'000's New Variations Expend.	2024/25 £'000's New Variations Rephasing	2024/25 £'000's Latest Budget
UK Shared Prosperity Fund	LEADER/ALL	208		22	230
Rural England Prosperity Fund	LEADER/ALL	300		231	531
Disabled Facilities Grants	HSG (GF)	1,500			1,500
Sustainability Fund - Unallocated	ENV & SUSTAIN	250	-150		100
Strategic Regional Coastal Monitoring (22-27)	ENV & SUSTAIN	2,667		258	2,925
Barton Horizontal Directional Drilling Trials	ENV & SUSTAIN	260		53	313
Hurst Spit Beach Shingle Source Study	ENV & SUSTAIN	100			100
Milford Beach and Cliff Study	ENV & SUSTAIN	100			100
Milford - Sea Wall Construction Works	ENV & SUSTAIN	100			100
Waste Strategy Containers	ENV & SUSTAIN	1,025		63	1,088
St Georges Hall, Calshot	ENV & SUSTAIN		375		375
Asset Modernisation Programme - Public Convenience	F&C/E&S	300			300
New Depot Site: Hardley	FIN & CORP	4,372		1,602	5,974
Ringwood Depot: Extension and Works	FIN & CORP	250			250
V&P; Replacement Programme	FIN & CORP	2,102		1,000	3,102
V&P; Replacement Programme - Waste Strategy Vehicles	FIN & CORP	885			885
ATC East Wing Boiler Replacement	FIN & CORP	160			160
Mitigation Schemes	PLAN & ECON	1,000			1,000
Infrastructure Projects	PLAN & ECON	1,000			1,000
TOTAL GENERAL FUND CAPITAL PROGRAMME		16,579	225	3,229	20,033
Fire Risk Assessment Works	HRA	1,000			1,000
Major Structural Refurbishments	HRA	1,260			1,260
HRA - Major Repairs	HRA	8,600			8,600
Decarbonisation	HRA	2,170			2,170
Estate Improvements	HRA	200			200
Council Dwellings - Strategy Delivery	HRA	18,200			18,200
Disabled Facilities Grants	HRA	950			950
TOTAL HRA CAPITAL PROGRAMME		32,380			32,380
GRAND TOTAL CAPITAL PROGRAMME		48,959	225	3,229	52,413

Cabinet – 4 September 2024

Customer Strategy

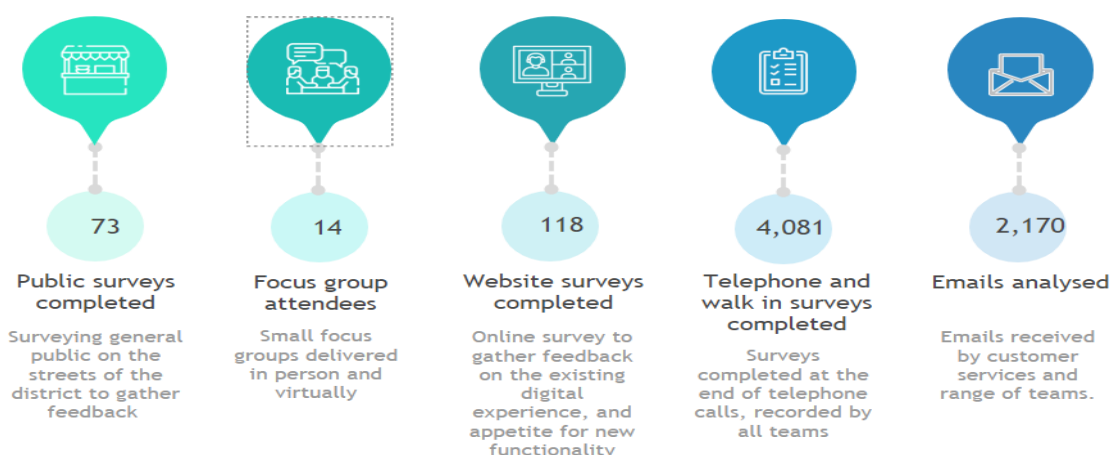
Purpose	For decision
Classification	Public
Executive Summary	<p>This strategy sets out the Council’s vision and commitment to achieve the best possible experience for our customers, whoever they are and whenever they deal with us.</p> <p>Through consultation we recognise that many of our customers want a more immediate service and expect to be able to contact us when it is convenient for them. Although we will adopt a digital by design approach to utilise technology to encourage self-service, access to services will still be available via telephone and face to face to support our vulnerable customers to ensure nobody is excluded.</p> <p>The Customer Strategy will embed a culture of the customer being at the heart of what we do to ensure the customer receives a professional and modern experience when interacting with the Council.</p>
Recommendation	That Cabinet recommend that Council approve the Customer Strategy
Reasons for recommendation	The Customer Strategy supports our commitment of putting the customer at the heart of what we do by understanding our customers’ needs and providing efficient, modern, and professional services to our customers.
Wards	All
Portfolio Holder	Councillor Jeremy Heron – Finance & Corporate
Strategic Director	Alan Bethune – Strategic Director Corporate Resources and Transformation
Officer Contact	<p>Ryan Stevens Service Manager Revenues, Benefits and Customer Services 02380 285693 Ryan.stevens@nfdc.gov.uk</p>

Introduction and background

1. The recently approved Corporate Plan sets our vision of “Investing in our people and services to meet customer needs” and “putting the customer at the heart of what we do,” with the focus being on our customers to ensure we provide “easy to use services and efficient working practices and processes”. Underpinning the Corporate Plan is the Transformation Strategy, Future New Forest (Transforming tomorrow, together) which identifies four challenges facing the Council: financial, capacity, modernising services, and climate. The strategy specifies four themes, of which Customer and Digital is one. The Customer and Digital theme is about how we redesign our services to improve the customer experience and make better use of technology. There are three objectives, these are:
 1. Our customers will be at the heart of our digital-by-design approach
 2. We will use data and insight to plan services, manage performance and direct our focus for transformation
 3. We will have the right systems, processes, and devices to ensure work can be done in the right place, right time and in the most efficient way
2. The Customer Strategy sets out how we will provide services to our customers, whoever they are and however they want to interact with us. The Customer Strategy supports both our Corporate Plan and the Transformation Strategy and our commitment to our customers by ensuring the customer is central to our thinking when reviewing process, utilising technology to modernise services to be more efficient, releasing capacity and reducing our environmental impacts.

Customer Insight

3. During 2023 we worked with Ignite consultancy to gather customer insight to understand our customers and to support shaping the strategy. The following activities were undertaken.



4. From the customer insight gathered there were some key themes, notably:
 - customers want assurance that their contact is being dealt with along with clear timescales
 - customers want to be able provide information once
 - 33% of the emails received were follow-up
 - 66% of customers want to do things for themselves online
 - there should be a range of access channels – including non-digital for those customers unable to interact online
5. Customers also stated that:
 - human contact gives us confidence
 - services are not always joined up
 - issues are usually resolved quickly when calling
 - staff are polite and professional
 - their feedback is not always listened to
 - they could not find, or do what they needed to do online, causing them to call
6. All of the insight gathered was considered when developing the Customer Strategy.

Consultation with staff and partners

7. Meetings were held with Change Champions who represented a range of teams from across the council. The group discussed the insight and research and current processes and procedures, alongside potential initiatives and technological enhancements which could be utilised to improve customer service. The strategy has also been discussed in Chief Executive staff briefings and shared with the Executive Management Team, the Leadership Team, and with teams providing customer services.
8. The draft strategy has been shared with Town and Parishes' where they provide an Information service on our behalf, residents who attended the focus groups in 2023, Tenant Involvement Group, and Citizens Advice New Forest. Feedback received from this consultation was reviewed and the strategy amended where appropriate.

Customer outcomes and principles

9. From the insight and research 4 key customer outcomes were considered which underpin the Customer Strategy, these are summarised as:

Understand	understanding the needs of our customers
Experience	providing customers with a positive experience
Access	providing a range of access channels for customers
Trust	keeping data secure and doing what we say

10. To achieve these outcomes four key principles have been considered, these are:

1	We will put customers at the heart of what we do
2	We will provide our customers with a consistent experience through all interactions with us
3	We will utilise technology to meet customer needs
4	We will use data to shape and improve service delivery

11. These outcomes and principles will be embedded into our culture across the Council, and we will ensure that when we are designing processes and procedures and implementing technology, we will do so with customer in mind to ensure we meet our customers' needs. The strategy supports a two-way relationship with our customers, listening to feedback and working together to create efficient and accessible services and getting things right first time.
12. Within the strategy there is a Channel Strategy to support our digital by design approach as we know that some customers want to do things for themselves, have easy to use access to services and reduce the use of email. The strategy is clear to ensure that those customers not able to interact digitally will not be excluded.

Customer promise and standards

13. The Change Champions group developed a *Customer Promise* which defines the way that all staff across the council will deal with our customers and supports the delivery of the customer outcomes and principles. This ensures we listen and learn, provide a positive experience, be open and honest and take responsibility. The promise also defines how we want customers to interact with us.
14. The group have also developed corporate standards to support providing a consistent customer service across the council.

15. Managers will endorse and promote the promise and standards to ensure they are embedded and adhered too.

Action plan and implementation

16. The Customer Strategy is ambitious and within the strategy is an Action Plan which provides details on the range of activities, along with timescales, to be undertaken. The Action Plan has been considered to ensure alignment with the ICT Digital Strategy and workplan. There will be some *quick wins* and activities to embed the customer centric culture, but due to timescales for procurement, installing, testing and implementation, some changes will not occur straight away, such as a new Customer Relationship Manager.
17. Using resources from ICT, Transformation, Customer Services, and key Officers from across the council, working groups will be established to deliver the activities in the Action Plan, and staff will be updated through various communication channels, including Monthly Meet and staff briefings, to ensure engagement.

Resources and Transformation Overview and Scrutiny Panel comments

18. The Panel fully support the Customer Strategy and recognise the need to invest and utilise technology to support those customers wanting to do more online for themselves. The Panel were reassured of the commitment to ensure that nobody is excluded from our services and access to services by telephone and face to face would continue, especially to support our most vulnerable residents.

Corporate plan priorities

19. The Customer Strategy supports our Future New Forest transformation programme and our Corporate Plan by putting the customers at the heart of what we do. The Customer Strategy is aligned to our commitment to investing in people and services and using insight and data to develop efficient working practices and processes, including easy to use digital services, to meet customer needs. Access to services by telephone and face to face will remain available to ensure we support our vulnerable customers.

Options appraisal

20. The Customer Strategy is a key strand to support and underpin our Transformation programme and has been developed using data, customer insight and in consultation with staff and partners.

Financial and resource implications

21. There are financial implications with the investment in modern technology that will support the customer strategy. These indicative

costings, which are significant, are included in the Transformation Business Case. Understanding our customers, reducing avoidable contact, utilising technology, and working more efficiently will provide opportunities to reduce costs and/or release capacity.

Legal implications

22. There are no legal implications arising directly from this report.

Risk assessment

23. There are no risk assessments required, however each project will have a detailed project plan, scope, and governance which will include an analysis of associated risks which will be regularly discussed and reviewed.

Environmental / Climate and nature implications

24. The customer strategy supports initiatives which promote positive environmental impacts, such as a reduction in paper usage.

Equalities implications

25. The customer strategy will ensure we understand the various channels different groups need to access our services and recognises that some customers are unable to access online services and is committed to supporting our vulnerable customers so that nobody is excluded. This includes providing access via telephone and in person and considering customer needs when designing services.

Crime and disorder implications

26. There are no crime and disorder implications arising directly from this report.

Data protection / Information governance / ICT implications

27. The Customer Strategy is aligned to the ICT work plan and officers will work closely with ICT on any technological implementations, for example a new Customer Relationship Management system, and consider any data protection implications, including reviewing and updating privacy notices.

Conclusion

28. The Customer Strategy sets out our vision and commitment to achieve the best possible experience for our customers and ensure there is a customer centric culture across the Council. It is ambitious and will take time to achieve. Although the strategy has utilising and enhancing technology to enable customers to self-service as an objective, we are committed to ensure nobody is excluded and that we still support vulnerable customers through telephone and face to

face. The strategy applies to all council employees and having the customer at the heart of what we do will ensure processes are designed to meet their needs. This strategy supports the wider Transformation Strategy and Corporate Plan.

Appendices

Appendix 1 – Customer Strategy

Background Papers:

Minutes of the Resources and Transformation Overview and Scrutiny Panel meeting of 25 July 2024

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Customer Strategy

2024-2028



Foreword

I am very pleased to support the publication of this strategy as part of the Council's ongoing transformation programme "Future New Forest, transforming tomorrow, together" where we will have committed to "investing in our people and services to meet customer needs". Customer is one of the four 4 themes that underpins the Transformation strategy, and will support and compliment other key strategies, such as digital and tenancy engagement, to ensure the customer is at the heart of what we do.

This strategy sets out the Council's vision and commitment to achieve the best possible experience for our customers, whoever they are (residents, businesses, or partners) and whenever they deal with us. This strategy sets out our plan to achieve this by implementing 4 key principles:

- creating a culture of putting customers at the heart of what we do
- ensuring customers receive a consistent experience when interacting with us
- utilising technology and embedding a digital by design culture across the Council
- use the data we hold to provide a better customer experience

Through consultation we recognise that many of our customers want a more immediate, personalised service and expect to be able to contact us when it is convenient for them. I am keen to ensure all customer channels, including digital, telephone and face-to-face, enhance the customer experience and are available to support our vulnerable customers. Equally our changes will aim to reduce avoidable contact and provide opportunities for greater customer feedback, whilst our capacity to reflect and respond to this will be built into our services to improve them. We will ensure our customers can interact with us easily, effectively, and when convenient, and we will manage expectations. A new set of customer standards will ensure a consistent experience from services across the council, and we will regularly monitor and review feedback and performance against them.

We want to ensure the customer receives a professional and modern experience when interacting with us and I am proud of how this strategy supports this aim.

Cllr Jill Cleary

Leader, New Forest District Council



Introduction

This strategy sets out the Council's plan for delivering our services to customers across multiple teams and communication channels.

We have recognised that our view of customers is not always joined up and that customers can be a customer of more than one service across the Council. We will transform how we work and deliver our services, focussing on understanding and examining our customers' experience, expectations to improve choices, our systems, and processes.

We must develop more cost-effective ways for our customers to interact with us, and support customers to self-help wherever possible by embracing technological solutions.

Therefore, we will ensure that:

- our customers have easy access to information
- we reduce demand through design of our services,
- we have the right skills and capacity to support complex or vulnerable customers
- we embed a positive customer focussed culture meeting agreed standards of service across the Council

The need for us to provide an effective and efficient customer experience is important to help us meet increasing demand for services, tackle complex problems and work within our resource levels. Our ambition is to get things right first time, every time, and deliver high quality, value for money services organised around our customers needs.

In delivering this Customer Strategy we aim to raise the profile of the customer throughout the organisation and ensure that our plans, decisions, actions, and culture, are customer focused. Customers will benefit from the delivery of this strategy as they will be able to give feedback, be listened to, have assurance, and have services designed to meet their needs. This will ensure we understand our customers, build trust, deliver services that are accessible and provide a consistent professional customer experience in a culture where we strive to continually improve the customer experience.

Our customers

Who are our customers?

We have 83,077 households and 7,900 businesses across the district, and a population of 175,778 residents, which is expected to increase to 182,800 by 2029.

The Council is the landlord to 5,200 tenants.

45% of our residents are economically inactive.

55.2% of our residents are of employable age.

29.4% of residents are aged over 65.

93% of residents access the internet (source: Residents Survey 2022).

3.6% of the population is aged 85 and above, this is forecast to be 6% in 2029.

28% of the population live in rural areas.

4 out of 114 neighbourhoods across the New Forest are in the top 20% most deprived neighbourhoods for income deprivation in England (2019 Index of Multiple Deprivation).

Customer experience in numbers

Delivering services to local residents and businesses, enabling them to report and request services, dealing with enquiries across all service channels and enabling residents to access information, is a significant part of our core purpose.

During 2022 and 2023

The following information about customer interactions gives just a flavour of the volume of interactions handled by our teams during 2022/23.

Number of phone calls - 151,801 from our Housing, Revenues and Benefits and Customer Services.

3,612 webchats and 102,063 emails to general inbox of highest customer contact teams and our website had over 1.1 million page views

There were 34,141 in person visits to our Information Offices.

The Council operates 4 Information Offices located in Hythe, Lymington, Lyndhurst and New Milton, and work in partnership with 4 town and parishes in Fawley, Fordingbridge, Ringwood, and Totton, to deliver in person customer services and support.

90% of customer interactions currently arrives via phone or email, even if an online form is used (Source: analysis of customer contacts 2023)

Our data tells us we have different types of customer enquiries for council services, and these can be summarised as follows:

- initial access. For example, reporting, paying, applying, or enquiring.
- report access (avoidable contact). For example, following up.
- mistaken access. For example, non-council services.
- ongoing interactions. For example, visits and inspections.



Our challenges

New Forest District Council (NFDC) has an ambitious Corporate Plan for 2024 to 2028 to meet the needs of local residents and businesses. We will be delivering this plan in the context of a rapidly changing world, and to support this we are delivering a transformation strategy.

To deliver the outcomes of the corporate plan, we are going to need to change as an organisation, responding to four key challenges identified in the transformation strategy which will impact every aspect of our operation. How we will interact with our customers is one of the objectives of the transformation strategy. We need to develop more cost-effective ways for our customers to contact us. We need to manage demand for our services, supporting customers to self-help and embrace technology, whilst recognising some customers will need support, and to improve the customer experience.

1. Modernising services

We will need to focus on customer needs and outcomes when redesigning services and seek feedback to improve. Our systems and processes need to keep pace with the advancing digital technologies and the impact these are having on people's lives and expectations.

There is growing demand for digital access to council services, accompanied by a high level of access to the internet and growing capability among our residents. We need to improve the customer experience by joining up our data and systems. We need to make it easier for customers to find the services they need and be able to connect with us at a time and place they choose.

2. Financial constraints

Rising costs of service delivery combined with new challenges and burdens means we are facing potentially significant budget deficits over the next four years. We must continue to find ways to reduce the cost of delivery and we must embed financial responsibility into all that we do. We will need to reduce service costs through redesign and encourage adoption of lower costs channels without impacting service quality.

3. Capacity and capability

The world is changing fast with the rapid growth of technology and artificial intelligence (AI). We need to develop new skills to respond to the opportunities and challenges we face. However, most councils are facing recruitment and retention problems. We need to identify and release capacity from parts of the organisation through greater use of technology to enable increased focus on our priorities. We need to develop a more agile workforce to respond to a changing local government landscape and a digital world without leaving our vulnerable customers behind.

4. Climate and sustainability

Meeting national and local targets to reduce emissions and support nature will require us to change the way we use resources and deliver services. We declared a Climate Change and Nature Emergency in 2021 and are committed to reducing emissions to reach net zero and supporting nature recovery. We must work in partnership with residents, businesses, and other public services to make a real impact. These changes will affect all aspects of council operations, and we will need to design services to be delivered in ways that promote positive environmental impacts.

Opportunities for change

We have undertaken extensive customer research to find out the views of our customers. This can be summarised as:

Connecting services

- Services are not always joined up
 - » Customers said they have to provide the same information to different teams
 - » 29% of telephone calls are transferred
 - » Customers are not always able to give feedback

A consistent customer experience

- There can be different customer experiences depending on which service you are accessing
 - » Customers said that they did not always get an acknowledgement or assurance on timescales
 - » 33% of emails received were follow up enquiries chasing the original enquiry

Increasing online capabilities

- Some customers want to be able to do more online
 - » 84% of customers from our web survey said it was easy to find information on our website
 - » 47% of customers said they could not find what they were looking for online, or do what they needed to do online
 - » 66% of customers want an online account where they can do things for themselves
 - » 74% of customers want to be able to upload documents online
 - » 71% of customers want easier forms to fill in

Increasing online capabilities

- We do not always utilise all the data we hold
 - » We hold lots of data and do not always use this to help design services

We are mindful that there are 10% of our customers who are not comfortable using online services and 7% of our population have no access to the internet. This strategy is clear in that we will continue to support our vulnerable customers.

Customer feedback 2023

"Provides an excellent service over the phone"

"Issues are usually resolved quickly when calling up the council"

"We don't like being passed around when we call"

"Human contact gives us confidence. We want to know it'll be done"



Customer outcomes

From reviewing customer feedback and the customer research we undertook, we have identified 4 key organisational outcomes that we will embed into our culture across the council as part of this customer strategy. This will underpin what we do and will ensure that customers have a professional experience when interacting with us.

In delivering our services we will understand our customers, provide a consistent and professional experience, enable customers to contact us in different ways and be trusted.

1. Understand

We will understand our customers and communities: who they are, what they need and their priorities and why they have contacted us. We will talk to them, listen to their feedback, and we will act on it where possible. We will create opportunities to engage with our customers. We will use customer data and insight to plan our services.

2. Experience

We will provide an efficient and professional customer experience. We will automate tasks where this can improve communication with customers and speed up outcomes. We will connect teams and share information so that customers do not have to repeat themselves. We will use feedback to continuously improve our customers' experience.

3. Access

Customers will be able to contact us in a range of different ways, according to their needs, including by phone and face to face. We will ask customers about how they need to be contacted and respect those needs whenever we can. We will invest in technology to make it possible for customers to access all services online, on any device, at any time.

4. Trust

Our customers will trust us to act on their requests and have confidence however they contact us. Customers will be able to track and check the status of their requests. We will always be fair and honest. We will keep data secure and use it for the benefit of customers, and we will have a reputation as a professional and efficient organisation.



Our customer promise

Our Customer Promise defines the way that all of our staff across the council will deal with our customers, whether they are residents, businesses, partners, or suppliers. Our Customer Promise will help us to deliver our outcomes of understand, experience, access and trust.

Listen and learn

To understand we will listen and learn by:

- actively seeking your feedback to improve services
- monitoring customer demand to identify what we can do differently and respond accordingly
- making it simple for you to tell us if we get something wrong and follow up with you where required
- providing you with opportunities to be involved in shaping our services

Positive experience

To ensure you have a positive experience we will be clear with you by:

- doing things when we say we will
- working towards making our website accessible to everyone
- providing information that is clear and easy to understand
- providing clear guidance on different ways you can contact us

Fair treatment

To ensure access we will be open, honest and respectful by:

- treating you fairly and with respect
- being understanding, approachable, open and honest
- providing a professional service
- updating you on progress so you know what is happening next and by when

Taking responsibility

To build trust we will take responsibility by:

- taking ownership for resolving your problem with you
- actively seeking to resolve customer concerns
- setting clear expectations about our services
- working together to get the best outcome

A respectful environment

We would like you to:

- treat us with respect and courtesy
- tell us what you think about our services
- use our website and online services to access services and information you need if you can
- sign up to resident emails if able to do so
- provide information we request in time
- tell us when something changes



Our 4 principles

Our Customer Outcomes and Promise will shape how we provide services to meet customer needs.

Our whole organisation approach will ensure we embed consistent behaviours, measure performance, and constantly review our services. We will design our services with our outcomes in mind to meet the needs of customers and make the best use of technology. This will help us meet our challenges, reduce the cost of delivering services and allow us to focus even more on supporting customers with complex needs.

Central to our principles is that the customer will have a positive experience wherever, and however, they interact with us. Our four principles will have our outcomes at their core, these are:

Principle 1

Understand: we will put customers at the heart of what we do.

Principle 2

Experience: we will provide our customers with a consistent experience through all interactions with us.

Principle 3

Access: we will utilise technology to meet our customer's needs.

Principle 4

Trust: we will use data to shape and improve service delivery.



Principle 1

We will put the customer at the heart of what we do.

We will consider what is important to our customers and take a whole organisation approach to bring services together so that we join up services. We aim to reduce avoidable contact, use our resources effectively and ensure our customers receive a good experience, by reviewing our processes and designing services to meet our customer needs and delivering first time resolution. We will ask for feedback to tell us how we are doing, and we will make improvements where appropriate. This will ensure we understand our customers.

To ensure we understand our customer we will:

- review and redesign services to meet customer needs
- understand and address the causes of avoidable contact
- actively listen to our customers and enable customers to give feedback
- work with partners to support our customers
- ensure access to our services are inclusive
- learn when we get it wrong and have a clear and transparent complaints procedure with a feedback loop to improve services and ensure lessons are learned
- embed positive staff behaviours at all levels across the Council
- set up a resident customer focus groups to hear their views
- ensure council policies are customer focussed

How will this be measured

Measure 1:

Devise a customer service training programme and deliver refresher training every 2 years.

Target: All staff dealing with customers

Timescale: End of year 1

Measure 2:

New starters to undertake customer service training as part of their corporate induction.

Target: 100%

Timescale: End of year 1

Measure 3:

Monitor complaint trends to ensure improvements have been embedded and problems not recurring.

Target: 100% of all complaints

Timescale: End of year 1

Measure 4:

Reduce face to face visits for payments.

Target: By 20%

Timescale: End of year 2

Measure 5:

Develop a customer focus group.

Target: To hold 2 meetings a year

Timescale: End of year 2

Measure 6:

Number of key customer interactions reviewed to understand the customer journey.

Target: To review the 10 highest customer interactions

Timescale: Year 2



Principle 2

We will provide our customers with a consistent experience through all interactions with us.

We want to make interacting with us easy and effective and our teams work together to give customers an easy, convenient, and joined-up experience, with assurances given so customers do not need to follow up with further contact. We join up information and train staff so that you do not have to give us the same information multiple times. Our aim is to achieve excellent customer service and provide customers with a consistent experience.

To ensure we provide a professional experience we will:

- have clear processes so customers understand how to contact us and understand what to expect
- keep customers informed and provide assurance and timescales
- take responsibility and aim to get a first-time resolution.
- adopt an “every contact counts” approach, adding value to every contact
- set up a Council wide Customer Focus Group to share ideas and good practice
- train staff with key skill which are logged on our Learning Management System (LMS)
- review how phone call calls are answered to free up resources to focus on other tasks
- work with town and parishes to understand and support our customers
- promote and embed our Customer Promise and standards
- standardise processes involving customers and bring these together where similar

How will this be measured

Measure 1:

Reduce phone calls and call transfers.

Target: 10% reduction

Timescale: End of year 2

Measure 2:

Customer satisfaction surveys.

Target: To confirm once systems in place and baseline agreed

Timescale: End of year 2

Measure 3:

Staff complete training on our LMS.

Target: 100%

Timescale: End of year 2

Measure 4:

Quality assessments through sampling of calls for high customer contact services.

Target: To be agreed once baseline confirmed

Timescale: End of year 2

Principle 3

We will utilise technology to meet our customer's needs.

We make better use of technology to provide modern and efficient services to our customers and opportunities for them to do things for themselves and "self-serve." We help customers use our website and provide alternative methods for access for those who are not able to. This will ensure customers can access our services.

To ensure customers can access our services we will:

- increase online services so that customers can do things for themselves
- simplify processes and automate where possible
- enable customers to interact and access services digitally at a time that suits them
- enable customers to provide information once
- implement a new Customer Records Management system
- review our wider technology such as phone, Webchat, and email management
- ensure our webpages are accessible, up-to-date and easy to read on all devices
- reduce our paper usage wherever possible
- have information available for staff to deal with customer queries
- have devices so work can be done in the right place, right time, and the most efficient way
- work with partner organisations to build digital skills
- have digital champions who will work with staff to educate and promote digital activities

How will this be measured

Measure 1:

Increase digital payments.

Target: TBC

Timescale: End of year 1

Measure 2:

Ensure website is accessible 24/7.

Target: 100%

Timescale: End of year 1

Measure 3:

Reduce use of paper to shift interactions to digital methods for high transactions.

Target: To be agreed once baseline confirmed

Timescale: End of year 2

Measure 4:

Increase online forms and self-services for high customer contact and key transactions.

Target: TBC

Timescale: End of year 2

Measure 5:

Reduce number of cheque payments.

Target: 50%, Timescale: End of year 2

Target: 100%, Timescale: End of year 3



Principle 4

We will use data to shape and improve service delivery.

We keep data secure, accurate, and compliant and only ask for information that we need. We research and analyse data to understand and to help make decisions about services. We will join up the data we hold across different services to provide a positive experience for the customer and aim to create a “golden record” of our customers so we can see all their data and avoid having to repeat providing information. This will ensure customers trust the council.

To ensure customers can trust our services we will:

- hold council wide data for staff to view when interacting with customers
- provide services using data and insight to ensure that we meet customer needs
- ensure our records are stored securely, are accurate and up to date
- provide a simplified customer experience
- improve data analysis and use it inform decisions with the customer in mind
- monitor performance data to inform and support decision making and responses
- join up our view of data to provide better customer service and better understand needs
- review and redesign customer journeys across all channels

- use data to size our services according to need and demand

How will this be measured

Measure 1:

Up to date data retention policies and compliance.

Target: 100%

Timescale: End of year 1

Measure 2:

Number of interactions through a customer portal.

Target: To be confirmed once portal is available

Timescale: End of year 2



Customer standards

We strive not only to meet customer expectations but to exceed them. To achieve our values and deliver our 4 principles to ensure our customers have a consistent experience, no matter which service they contact, we will implement the following customer standards:

We will:

- aim to deal with your request by the first person you contact for all non-complex contact
- aim to answer your call in 3 minutes
- acknowledge customer contact and give timescales for replying when not able to do so immediately
- give a name, department, and contact number to call back when leaving a message
- always communicate clearly and in plain language
- respond to enquiries and written communication within 10 working days
- embed corporate response standards when using email, letters, record taking, and voicemails
- have online services which are accessible 24//7
- adhere to our corporate style guide for communications
- acknowledge, clarify, and respond to complaints within published timescales

Channel strategy

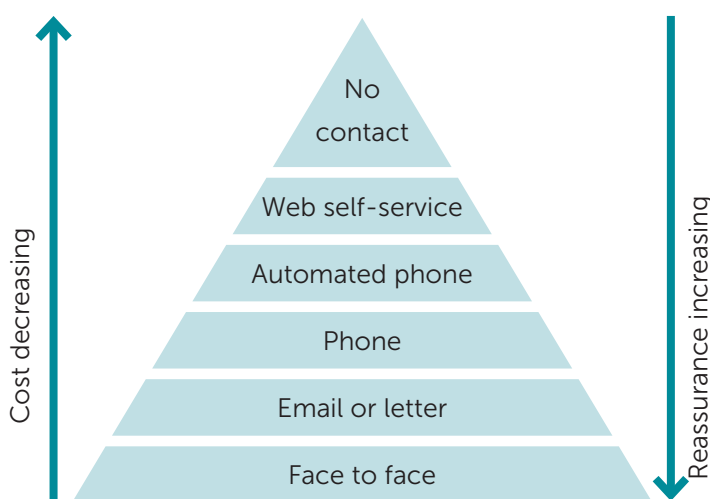
The channels through which public services are delivered and by which the public has contact with the Council, (for example by telephone, online, through social media, in person, or via other means), are an important part of how we provide our services, and there is an ongoing need for them to be managed effectively and efficiently for everyone. A channel strategy is an organisation's plan for the channels it will use to deliver services to, and interact with, its customers, and it explains how the council will meet the contact demands of its customers using the resources it has available and is not simply a plan to move service provision to online channels.

Research states that 99% of the UK is online and since the pandemic 65% of those have tried something new online, such as shopping or paying bills, and most (90%) have sustained this (Source: UK Consumer Digital Index 2022). We know that 93% of our residents have access to the internet (Residents survey 2022) and from our research we know our customers want to do more online, with access to easy-to-use forms, which are simple to complete, and at a time that suits them.

From our research we know customers like to contact the Council by telephone, as this gives assurance. However, we know that getting customers to do more online is cost effective and cheaper for the council, but assurance is needed. Providing access to services and being able to self-serve which is accessible and easy to use will mean customers can interact when convenient to them and avoid having to contact the council.

There is still the need for face to face and telephone contact and this is an important part

of our strategy to ensure we support vulnerable customers and that they are not excluded, our services will be inclusive and accessible. This may include using our offices to create hubs and have support available to customers where they can be supported.



This diagram shows how communication types that are high in reassurance will be high in cost, whilst types that are low in cost will be low in reassurance.

The channel strategy is part of the wider customer strategy and describes how the vision, outcomes and objectives of the customer strategy will affect how customers can contact the council in the future. There will be a mix of access channels, giving the customer choice, which are accessible, well managed and designed and customer experiences will be reviewed to improve access and customer journeys.



Our key channel strategy principles

Digital by design

We will provide a choice of contact channels, including telephone, for all our services.

We will prioritise development of digital channels for high demand, low complexity services, and services with high levels of avoidable demand.

Easy to access

We will simplify how customers contact us by providing one primary customer portal and minimising published phone numbers.

We will ensure our services are accessible and do not exclude those with disabilities or additional needs, for example translation services.

Meet customer needs

We will direct customers to the channels most likely to meet their needs.

We will prioritise telephone and face-to-face for customers who cannot use digital channels, have complex needs, or where these channels can help prevent future demand.

Keep customers informed

We will use digital channels to proactively update customers about cases they have raised and issues affecting their neighbourhoods, to reduce the need to contact and chase us.

We will keep all case-related information and updates between staff against their case, to provide them with the latest updates.

Minimise email and post

We will minimise the use of email and post as a channel for new requests and providing documents by utilising and encouraging use of digital channels.

Digital payments

We will prioritise digital channels for payments unless specific exemption criteria are met.



Key tasks

This strategy is ambitious and central to achieving our aims and meeting our future challenges. As we embark on our transformation journey, the four customer outcomes and principles will be applied to all transformational activity to ensure they support the objectives. We will embed this strategy over 4 years and there are several key tasks to undertake to provide the foundations to implementing.

Each part of this journey needs to be assessed to ensure it meets our aims, resources are planned, and it is responsive to changing technology and evolving customer expectations and needs. To understand and develop this strategy there are some key tasks aligned to our transformation strategy that need to be undertaken, these are:

Year 1:

Define a core set of digital capabilities and devices to support service redesign

Identify opportunities to streamline and automate business processes

Align the Digital Strategy and road map

Review the activity analysis of high transactional services

Review action plans identified from research

Scope and procure digital solutions, including a Customer Relationship Management (CRM) system, that supports our digital by design approach

Year 2:

Service and process redesigns

Identify data sets to monitor performance and provide real time information

Review standards are embedded

Develop and embed CRM solution and customer focused digital solutions

Embed customer feedback

Year 3:

Review corporate standards

Align Digital Strategy and review

Measure 4:

Review strategy

Annexe 1

Action plan

Whilst working through the key activities there are still actions which can be undertaken to embed this customer strategy over the next two years, which we will continually review. There are summarised as:

Principle 1

We will put customers at the heart of what we do.

Actions:

Year 1: Establish a residents Focus Group

Year 1: To review how customers can give their feedback

Year 1: Understand and address the causes of avoidable contact in high customer contact services

Year 2: Review the induction programme for new starters

Year 2: Devise a customer service training programme which is undertaken every 2 years

Year 2: Develop feedback channels for customers

Principle 2

We will provide our customers with a consistent experience through all interactions with us.

Actions:

Year 1: Launch customer standards and staff to attend awareness sessions

Year 1: Establish a council wide Customer Focus Group

Year 1: Launch Customer Promise

Year 1: Review Service Level Agreements with Town and Parishes

Year 2: Adopt a "make every contact count" approach

Year 2: Sample check to ensure customer standards adhered to

Year 2: Liaise with key partners for feedback on customer experience

Principle 3

We will utilise technology to meet customer needs.

Actions:

Year 1: Scope and procure CRM and consider wider customer access channels

Year 1: Review use of paper to shift to digital

Year 2: Review website to ensure it is accessible

Year 2: Review our online forms

Year 2: Provide real-time information on key performance indicators

Year 2: Review CRM and access channels to ensure meeting specifications

Principle 4

We will use data to share and improve service delivery.

Actions:

Year 1: Identify datasets that help us to understand customers and demand

Year 2: Join up data to avoid customers having to duplicate information

Year 2: End to end mapping of high customer contact journeys

Cabinet – 4 September 2024

Christchurch Bay & Harbour Flood & Coastal Erosion Risk Management (FCERM) Strategy

Purpose	For Decision
Classification	Public
Executive Summary	<p>BCP Council, NFDC, and the Environment Agency have worked collaboratively to develop a FCERM Strategy for Christchurch Bay and Harbour that extends from Hengistbury Head Long Groyne to the western end of Hurst Spit on the open coast.</p> <p>There are large areas of open space and sites of significant environmental importance around much of the frontage. This diverse coastal environment provides extensive access and recreation opportunities.</p> <p>The coastline is complex with a variety of risks including, tidal flood risk around Christchurch Harbour and coastal erosion / landslide risk along parts of the open coast. The risk of coastal flooding and erosion will likely increase significantly through the predicted climate change impacts.</p> <p>Without implementing measures to manage the risks, over 1,200 properties are at risk of erosion and over 100 properties at risk from coastal flooding by 2124. The estimated damage from the risk of coastal flooding and erosion over the next century if we do nothing is £1.21 billion (cash) or £186 million (when discounted).</p> <p>The recommended leading options identify where and when potential defence schemes can be implemented along the frontage in order to mitigate these risks. In some parts of the Strategy area, local leading options are also identified; these options would provide greater local benefits to communities, though require additional funding and have been informed by the stakeholder feedback that has been received.</p> <p>Stakeholder engagement has been a key part of the development of the Strategy. Engagement and consultation included face-to-face drop-in</p>

	<p>events, public online presentations with Q&A sessions, stakeholder workshops and surveys. In total, over 12,000 people have viewed our website information.</p> <p>The key difference between the national and local leading options is timing and/or cost. For either option the Strategy identifies a significant funding challenge in order to deliver the national and/or local options as only a proportion of the total costs are eligible to access national Grant in Aid funding.</p> <p>The scale of the contributions required over the next 100 years in cash terms across the NFDC area ranges from £88m-£99m, depending on which combination of recommended options are taken forward. Over the next 20 years, the contributions required in cash terms are estimated to be between £39m-£50m. It should be noted that these are indicative and may change (up or down) as more work is done to refine schemes, works, costs, etc.; as such these values act as a guide to the likely level of contributions that will need to be secured to enable FCERM investments to occur in line with the identified leading options.</p> <p>If funding contributions are not achieved, then in some areas a back-up option is identified that will provide a minimum amount of intervention to manage risks for a period of time, but this will eventually cease and the do nothing scenario will become more likely, leading eventually to the scale of damages and loss described above. In some cases, any intervention, even if funding can be secured, is unlikely to mitigate the long-term risks posed by climate change in terms of increasing risk of coastal flooding, erosion and land sliding. Therefore, the measures set-out in this Strategy need to be considered as buying time and reflected in wider-Local Planning policy.</p>
<p>Recommendation(s)</p>	<p>i. That Cabinet recommend that Full Council approve and adopt the recommended leading options identified in the Christchurch Bay & Harbour Flood & Coastal Erosion Risk Management (FCERM) Strategy for the New Forest</p>

	<p>District Council area, subject to securing the necessary funding contributions.</p> <p>ii. In approving and adopting the strategy, that NFDC commits to developing a Funding Strategy that will seek to identify and aim to secure the necessary funding contributions to enable the national or local leading options to be implemented via future capital schemes and maintenance of existing/new schemes, noting that the exact amount of contributions will need to be confirmed as schemes are developed.</p> <p>iii. Cabinet notes that there is no statutory duty upon NFDC as the Coast Protection Authority to undertake coast protection works, nor does the adoption of the strategy bind NFDC to commit to the provision of any funding for the delivery of the identified options.</p> <p>iv. Cabinet notes that throughout the development of the strategy extensive engagement and consultation has been undertaken with:</p> <p>1. Residents & wider communities (including landowners, community groups, organisations and individuals)</p> <p>2. Key stakeholders,</p> <p>3. Officers & members</p>
<p>Reasons for recommendation(s)</p>	<p>Approval and Adoption of this FCERM Strategy by BCP Council, New Forest District Council and the Environment Agency, ensures that technically feasible, environmentally acceptable and economically viable options are developed to reduce the risks from coastal flooding and erosion to people, their properties and the environment over the next 100 years for the coastline from Hengistbury Head to Hurst Spit.</p> <p>Without such an approach, it is likely that current management approaches would continue in the short term and future coastal defence works would be managed on an 'ad-hoc' or reactive</p>

	<p>basis which would lead to poor cost efficiency and a general increase in the coastal flood and erosion risk over time.</p> <p>The adoption of the strategy supports the Place priority no.2 within the Corporate Plan for better "Protecting our climate, coast and natural world".</p>
Ward(s)	Barton & Becton Ward and Milford & Hordle Ward
Portfolio Holder(s)	Cllr Geoff Blunden –Environment & Sustainability
Strategic Director(s)	James Carpenter – Place, Operations and Sustainability
Officer Contact	<p>Steve Cook</p> <p>Service Manager Coastal</p> <p>02380 285311</p> <p>Steve.cook@nfdc.gov.uk</p>

Introduction and background

1. Bournemouth, Christchurch and Poole Council (BCP), New Forest District Council (NFDC), and the Environment Agency have been working to develop a new FCERM Strategy for Christchurch Bay and Harbour (hereafter referred to as The Strategy) since the Spring of 2021. There has been extensive engagement with local communities and statutory stakeholders alike to identify and now recommend an adaptive approach to how the risks of coastal flooding, erosion and land-sliding in this area can be managed sustainably over the next 100 years in a changing climate.
2. The strategy identifies where, when and what type of works are needed to manage the risks of coastal flooding and erosion over the next century and what they may cost Report should flow with continuous single numbering, for ease of reading.
3. As Coast Protection Authorities, BCP and NFDC do not have any statutory duty to undertake coast protection work but can use permissive powers to protect the coastline and work with communities to help them adapt to future coastal change.

Why A Strategy Is Required

4. Coastal strategies sit at the second tier in the hierarchy of coastal management in England, sitting below the high-level Shoreline Management Plan policies (see table 2.1 of StAR). It is the role of the Strategy to consider how coastal flood and erosion risk is likely to change in the future, in response to climate change and to develop sustainable and robust options to manage the risks associated with coastal flooding and erosion. Developing a Strategy ensures that technically feasible, environmentally acceptable and economically viable options are recommended to reduce the risks from coastal flooding and erosion to people their properties and the environment.
5. For NFDC, this area of our coastline will experience significant risk to property and asset losses, through exposure to the greatest storm impacts from the southwest, along with a series of complex cliffs that are significantly affected by groundwater issues. Current coastal defence assets throughout the bay are at the end of their lifespan, with failures already being experienced, such as at Westover in 2020.
6. Without a strategic approach, it is likely that current management approaches would continue in the short term and future coastal defence works would be managed on an 'ad-hoc' or reactive basis which would lead to poor cost efficiency and a general increase in the coastal flood and erosion risk over time. A Strategy is also important to deliver an integrated approach to the management of our coastline. Holistic wider-level thinking behind Strategy decisions ensures that the management options implemented in one area do

not increase the coastal flood and erosion risk in adjacent areas, and that opportunities to deliver wider benefits are not missed.

7. Importantly the Strategy is required to help gain approval for future schemes and obtaining public funding from central government for coastal defences known as flood and coastal erosion risk management grant in aid (FCERM-GiA).
8. However, it is important to note that there is no guarantee that any of the options recommended in the Strategy will be progressed. Implementation of options will be subject to funding availability and to gaining required consents. Public funds for coastal management are not widely available, so significant funding from a variety of sources will be needed to progress any options in this Strategy.

Strategy Development

The Strategy Area

9. Since the Spring of 2021, supported by £525,000 Flood and Coastal Erosion Risk Management (FCERM) Grant-in-Aid from central Government, BCP Council, NFDC and the Environment Agency have worked collaboratively with the Engineering and Environmental Consultancy AECOM, to develop a new FCERM Strategy for Christchurch Bay and Harbour.
10. Due to the connectivity of the physical processes across Christchurch Bay and Harbour the Strategy area extends from Hengistbury Head Long Groyne to the western end of Hurst Spit at Milford-on-Sea on the open coast, and to Tuckton Bridge and Knapp Mill on the lower Rivers Stour and Avon within Christchurch Harbour respectively.
11. The coastline is complex with various risks including tidal flood risk around Christchurch Harbour and coastal erosion/ landslide risk along parts of the open coast. The population of the strategy area, including the towns of Christchurch, Highcliffe, Barton-on-Sea, Milford-on-Sea and New Milton is estimated to be over one hundred thousand.
12. The area contains a mix of residential and commercial properties. There are large areas of open space and sites of significant environmental importance around much of the frontage, including environmental designations and historical landmarks. This diverse and interesting coastal environment provides extensive access and recreation opportunities and is widely used for leisure by many visitors each year. Christchurch Bay beaches are popular with swimmers, surfers, sailors and walkers alike.

Current Defences

13. Many parts of the Strategy frontage are already defended; however, the condition, standard of protection (SoP) against coastal flooding and erosion and the expected life of these defences is highly variable.
14. Coastal defences are owned and maintained by both councils (BCP and NFDC), the Environment Agency and by private landowners. Many of the defences are in poor condition and are close to the end of their residual life. These assets require significant investment to withstand the impacts of climate change now and into the future.

Present And Future Coastal Flood & Erosion Risk

15. Significant areas of land around Christchurch Harbour are at risk of flooding from large storm events. Parts of the open coast are at threat from coastal erosion.
16. In the future, with the increased storminess and rising sea levels that are predicted because of climate change, the risk of coastal flooding and erosion is likely to increase significantly.
17. Without actively implementing measures to manage coastal flood and erosion risks, over 1,600 properties are likely to be at risk of erosion and over 2,200 properties at risk from coastal flooding by 2124, in the strategy area. The table below identifies the properties within the New Forest District at risk. In addition to the property losses there will be losses of amenity / recreation land, along with other assets, such as beach huts, car parks and public conveniences.

Strategic Management Zone (SMZ)*	Properties at risk of coastal erosion by 2124**	Properties at risk of coastal flooding by 2124	Economic damages over the next 100 years (£k - cash)
4 (Naish Cliff & Barton-on-Sea)	597	0	184,139
5 (Taddiford)	1	0	707
6 (Milford-on-Sea)	661	139	208,216
	1,259	139	393,062

* See section 4 for explanation of SMZs

**Properties at risk from table 3.2 StAR & damage costs table 3.8 Economic Appraisal Report

18. In economic terms, the estimated damage from the risk of coastal flooding and erosion along the strategy frontage over the next century if we do nothing is £1.21 billion (cash) or £186 million (when discounted following HM Treasury guidance to allow for a comparison of future values in terms of their value in the present day).

The Strategy Development Approach

19. The Strategy has been developed in a staged approach. The first stages were focused on understanding the key features, issues and opportunities that exist within the Strategy area. To achieve this, several studies and activities were undertaken during the early stages of developing the Strategy. These included:
 - i) Site walkovers and visual asset inspections to determine the location, type and condition of coastal defences and assets;
 - ii) A study of coastal processes to understand waves, tides, sediment movements and to look at the longer-term coastal flood and erosion risk to both the open and harbour coastlines;
 - iii) Identification of important environmental and heritage features along the frontage – so that key environmental objectives and legal requirements to protect the environment can be accounted for in the Strategy;
 - iv) Baseline economic assessment, including wider benefit assessment such as Gross Value Added assessment;
 - v) Identifying potential broader outcomes and opportunities – to capture ideas as to how the Strategy can be funded as well as deliver wider benefits to communities.
20. Having developed the above understanding, the latter stages of the Strategy development focused on identification and evaluation of a range of strategic approaches to managing coastal flood and erosion risks from long-list to short-list and then to leading preferred options (further details are provided below and in Appendix 1).

OPTIONS APPRAISAL APPROACH

21. The options appraisal process to identify and evaluate the range of strategic options involved identifying with stakeholders a wide-range of potential long-list options, appraising those against a multi-criteria appraisal matrix (also informed by stakeholder feedback) to identify a short-list of options, and then more detailed appraisal of that short-list to determine leading preferred options.
22. The options appraisal for the Strategy has been undertaken across a spatial framework consisting of six high level Strategic Management Zones (SMZs) shown in Figure 1. These have been further sub-divided into a total of eighteen smaller Option Development Units

(ODUs) shown in the table below and in Figures 2 to 4 (NFDC area only). By dividing the Strategy frontage into these distinct areas, it has allowed the appraisal to develop options that are strategic in nature, but also consider local risks and opportunities at the ODU level. It also ensures that the Strategy considers the impact of options on nearby and adjacent locations.

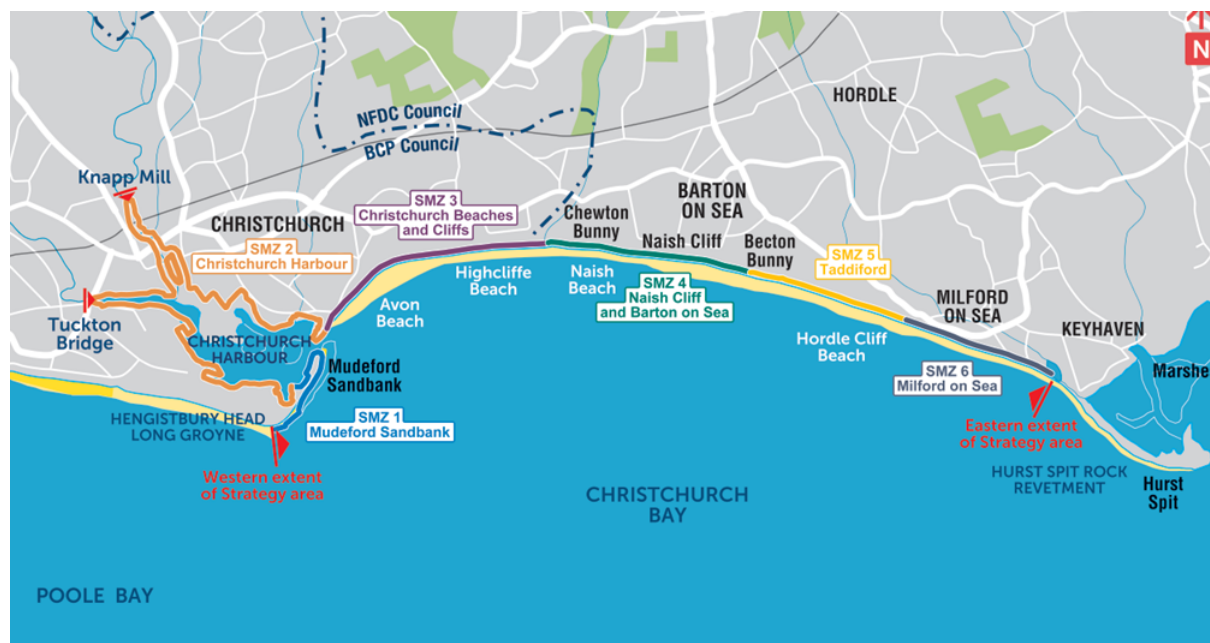


Figure 1 The Strategy Management Zones defined across the Christchurch Bay & Harbour area.

SMZ	Authority	ODUs
1 - Mudford Sandbank	BCP	1 & 2
2 - Christchurch Harbour	BCP	3, 4, 5, 6, 7, 8, 9, 10 & 11
3 - Christchurch Beaches & Cliffs	BCP	12 & 13
4 - Naish Cliff & BoS	NFDC	14
5 - Taddiford	NFDC	15
6 - MoS	NFDC	16, 17 & 18



Figure 2 The ODUs defined in SMZ4 of the strategy area.

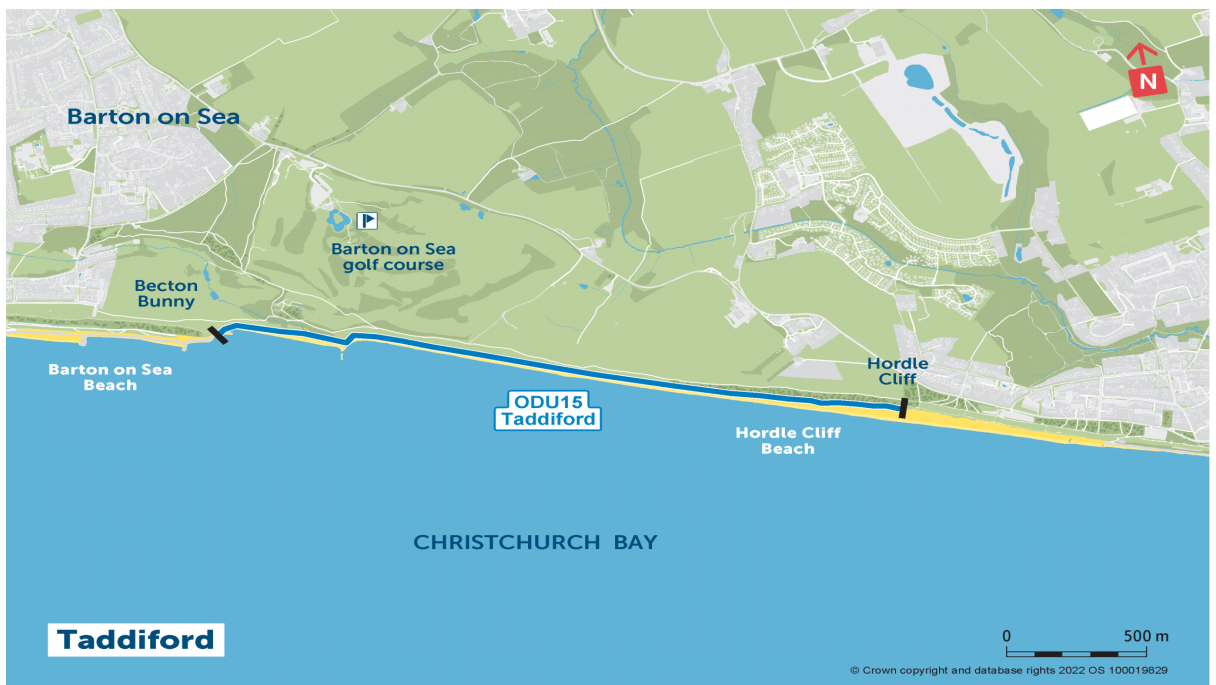


Figure 3 The ODUs defined in SMZ5 of the strategy area

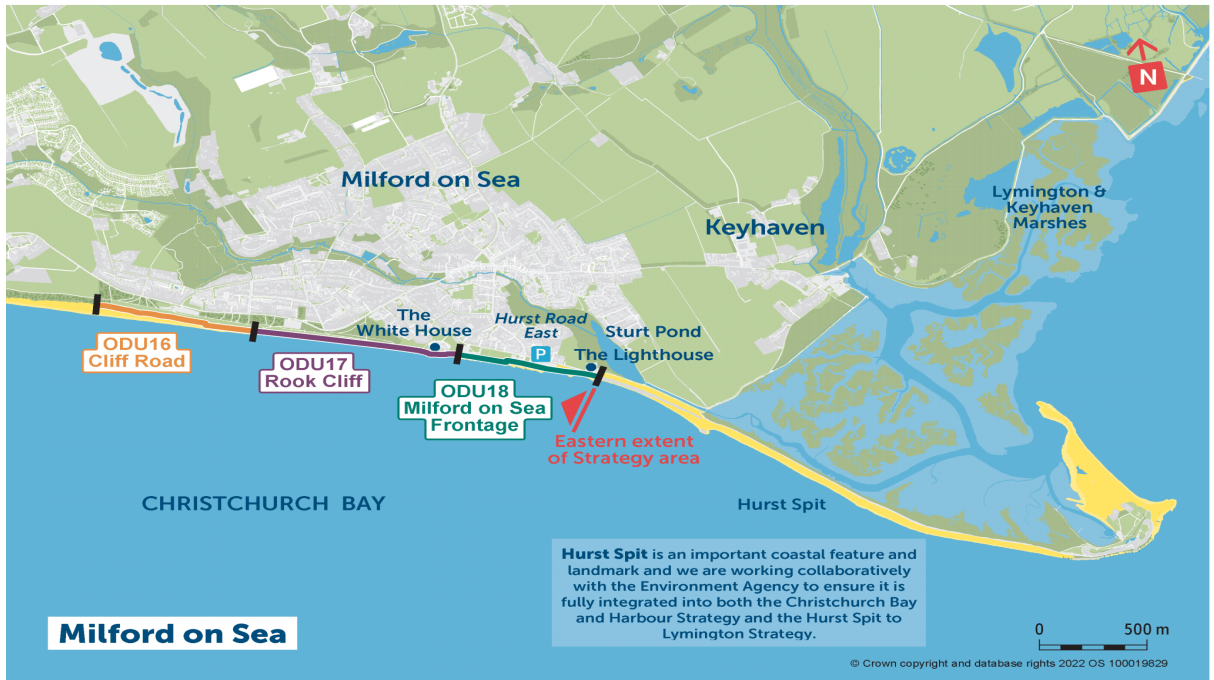


Figure 4 The ODUs defined in SMZ6 of the strategy area.

23. The options developed for the Strategy outline what the strategic intent of the option is (Do Nothing, Do Minimum, Maintain, Managed Realignment, Sustain or Improve the standard of protection) and the timings of the defence measures that are required to achieve this. The timings of defence measures were developed based on three-time epochs in the Strategy:
- Epoch 1 (short term): between 2024-2044
 - Epoch 2 (medium term): between 2044-2074
 - Epoch 3 (long term): between 2074-2124
24. In each ODU, up to three types of proposed leading options have been identified. These include:
- the National Economic leading option, which is identified by following the Environment Agency’s FCERM Appraisal Guidance. This option has been identified in each ODU and forms the basis of the appraisal;
 - the Local Aspirational leading option has been identified in some ODUs and considers local opportunities, wants and needs to deliver wider benefits (informed by stakeholder engagement during development of the Strategy). This option typically costs more than the National Economic leading option and/or would be delivered sooner; and
 - the Back-up option has been identified in some ODUs when there is a large funding shortfall. It is typically a lower cost option that will be more easily delivered if funding is limited and may not reduce risks in the longer-term.

25. Each type of option outlines the planned coastal defence interventions during the different epochs, in the form of an adaptive pathway for each ODU.
26. Given that funding is a key constraint that has been identified, alongside other factors, including uncertainty such as the onset of coastal flooding and erosion risks and the rate of change that may occur in these risks due to climate change, identifying these adaptive pathways provides a flexible approach that will enable the ability to adjust course depending on the risks / funding availability. For example, if more funding becomes available than expected, the delivery team could switch from delivering the National Economic Leading Option to the Local Aspirational Option.
27. Further details on the options appraisal process are provided in Appendix 1.

THE RECOMMENDED PREFERRED OPTIONS FOR NFDC

(Refer also to Appendix 1 and Appendix 2)

28. SMZ 4 – Naish Cliff and Barton on Sea
 - SMZ 4 (Naish Cliff and Barton on Sea) includes the settlement of Barton on Sea and the currently undefended stretch of coastline at Naish Cliff. There is only one ODU in this zone, ODU 14, and the main risk facing this area is from erosion. ODU 14 is characterised by steep topography and an active cliff face that is environmentally designated as a Site of Special Scientific Interest (SSSI). The cliff in this area is a complex cliff and when undefended it erodes from the combined influence of sea erosion of the cliff toe and groundwater induced instability. Considering affordability constraints, and environmental designations along the cliff, it is unlikely to be possible to completely stop cliff erosion in this location.

- The leading options in ODU 14 are likely to obtain central government funding for only a small proportion of the scheme costs (around 12%). Therefore, the majority of the cost will need to be funded from alternative sources, total cash value over 100 years estimated to be £41.5m.
- The recommended preferred options in this SMZ are summarized in the following table:

ODU		National Economic Leading Option	Local Aspirational Leading Option	Backup Option
14 – Naish Cliff and Barton on Sea	Option	Managed Realignment A	-	Managed Realignment B; or Managed Realignment D; or Maintain
	Details	Improved toe defences and cliff stabilisation / drainage in the area between Marine Drive West and the eastern end of Barton on Sea during the first part of epoch 1. This would help to slow rates of cliff top recession but not stop it entirely.	-	Managed Realignment B: As per Managed Realignment A, except defence improvements would be undertaken during epoch 2. Managed Realignment D: As per Managed Realignment B, except no new cliff drainage and toe protection at Marine Drive West. Maintain: Maintain existing defences and functioning drainage but no new defences constructed.
	Option cost present value¹ (PV £k)	22,211	-	Managed Realignment B: 19,718 Managed Realignment D: 14,218 Maintain: 5,927
	Option benefits (PV £k)	23,489	-	Managed Realignment B: 20,077 Managed Realignment D: 14,391 Maintain: 5,959
	ABCR (Average Benefit Cost Ratio)	1.06	-	Managed Realignment B: 1.02 Managed Realignment D: 1.01 Maintain: 1.01
	Estimated partnership funding (PF) score for initial intervention	12%	-	-
	Estimated GiA availability for initial intervention (cash £k)	3,215	-	-

¹ When comparing costs and benefits across different time periods we discount the future. Discounting gives Present Value (PV), which is a way of representing the current value of future cash flows, based on the principle that money in the present is worth more than money in the future. More details on discounting can be found in the [Green Book](#).

29. SMZ 5 – Taddiford

- SMZ 5 (Taddiford) includes ODU15 and covers the area between Barton on Sea and Hordle Cliff. The area is currently undefended with no defences in front of the cliff. The beach provides the only protection to the cliff toe from erosion and also holds a recreational / amenity benefit. A permissive path exists along the cliff top (part of European long-distance path, route E9). There is no risk from tidal flooding in this location and the main source of risk is from erosion. However, relative to other parts of the frontage the erosion risk to properties is very low with minimal properties at risk (there are therefore no economic damages in this unit). This zone's full length is fronted by a marine Special Protection Area designation, and the cliffs are part of the Site of Special Scientific Interest (SSSI).
- The option for this SMZ is do nothing, no defence maintenance (there are no defences) or beach management undertaken. If appropriate undertake health and safety activities following cliff erosion events to make safe public spaces.
- The Do-Nothing option is in line with SMP policy and due to there being minimal properties at risk there is no justification to construct new defences. There is potential to place additional beach material in this unit as part of a wider beach nourishment scheme and due to the longshore transport direction being from west to east, this would provide benefit to SMZ 6 to the east. Options for material placement may be explored after the Strategy during the outline design of future schemes in SMZ 6.

30. SMZ 6 – Milford – on – Sea

- SMZ 6 (Milford on Sea) includes ODUs 16, 17 and 18 and covers the frontage between Hordle Cliff and the western end of Hurst Spit. The cliff elevation reduces from west to east in this zone. There is a risk of coastal erosion in this location and there is also localised flood risk at the eastern end of ODU 18 where the cliff elevation is reduced. Here wave overtopping can occur from the open coast, and there is also a risk of tidal inundation and fluvial flooding from the Sturt Pond and Danes Stream area. A key issue for this frontage is the management of beach levels. There has been a recent trend of beach erosion that has increased the pressure on the defences at the back of the beach. Here a beach is required to protect the toe of the existing seawall and in the past low beach levels have contributed to seawall failures. The leading options focus on managing the beach levels in this location through periodic nourishment and larger scale beach nourishment schemes.

- The appraisal of options for Hurst Spit itself is being led by the adjacent Hurst Spit to Lymington Strategy. Both project teams have collaborated to ensure a joined-up approach is taken. The leading options in ODUs 16-18 will ensure that the options for managing Hurst Spit can also be undertaken (and vice-versa).

- o The recommended preferred options in this SMZ are summarized in the following table:

ODU		National Economic Leading Option	Local Aspirational Leading Option	Backup Option
16 – Cliff Road	Option	Managed Realignment C	Managed Realignment A or B	Maintain
	Details	From second half of epoch 2 undertake beach nourishment and construct local strong point to control rate of cliff erosion. Cliff top recession would still occur but intent would be to prevent it reaching Cliff Road.	As per Managed Realignment C, except beach nourishment and strong point would be constructed much sooner, in either epoch 1 (Managed Realignment A) or start of epoch 2 (Managed Realignment B)	Maintain existing defences and undertake beach recycling to control beach levels. In the long term this is likely to lead to more erosion than the Managed Realignment options.
	Option cost (PV £k)	4,405	5,069 – 5,612	1,791
	Option benefits (PV £k)	7,400	7,400	3,017
	ABCR	1.68	1.32 – 1.46	1.68
	Estimated PF score for initial intervention	19%	21% – 29%	-
	Estimated GiA availability for initial intervention (cash £k)	1,932	1,301 – 1,564	-
17 – Rook Cliff	Option	Improve C	Improve A or B	Maintain
	Details	Refurbish existing cliff toe defences in epoch 1. From second half of epoch 2 upgrade defences at cliff toe.	As per Improve C, except toe defence improvements would be constructed much sooner, in either epoch 1 (Managed Realignment A) or start of epoch 2 (Managed Realignment B)	Maintain existing defences at the toe of the cliff. Long term sustainability of this approach is uncertain given lowering beach levels in this location and this option is therefore likely to lead to more erosion than the Improve options.
	Option cost (PV £k)	9,055	9,376 – 11,471	4,110
	Option benefits (PV £k)	11,516	11,516	4,222
	ABCR	1.27	1.00 – 1.23	1.03
	Estimated PF score for initial intervention	20%	15% - 18%	-

ODU		National Economic Leading Option	Local Aspirational Leading Option	Backup Option
	Estimated GiA availability for initial intervention (cash £k)	3,457	2,400 – 2,676	-
18 – Milford on Sea	Option	Improve A / Improve B	-	Maintain
	Details	Upgrade seawall, construct new groynes and undertake major beach nourishment from epoch 1. Construct setback tidal flood defences at eastern end of Milford on Sea to reduce risk of flooding from Sturt Pond direction in epoch 2. Improve B: As per Improve A, except upgrade coastal defences and beach nourishment in epoch 2. Refurbish existing defences in epoch 1 to extend service life until upgrade.	-	Maintain: Maintain existing defences and undertake beach recycling. Long term effectiveness is uncertain.
	Option cost (PV £k)	11,060 (Improve A) / 11,035 (Improve B)	-	Maintain: 8,872
	Option benefits (PV £k)	11,155 (Improve A or Improve B)	-	Maintain: 8,933
	ABCR	1.01 (Improve A or Improve B)	-	Maintain: 1.01
	Estimated PF score for initial intervention	12%	-	-
	Estimated GiA availability for initial intervention (cash £k)	1,355	-	-

- The leading options in this SMZ are likely to obtain central government funding for only a small proportion of the scheme costs (around 12-29%). Therefore, the majority of the cost will need to be funded from alternative sources, totaling cash value over 100 years estimated to be in excess of £57m.

31. The Strategy's recommended leading options identify where and when potential defence schemes can be implemented along the frontage but identifies a significant funding challenge in order to deliver the national and/or local options.

Corporate plan priorities

32. The strategy supports the "Place Priorities" identified within the Corporate Plan, particularly priority 2 – "Protecting our climate, coast and natural world."
33. Priority 2 specifically refers working with partners to deliver FCERM strategies, which will set actions for protecting our coastline. This strategy identifies risk, mitigation actions and funding requirements for better protecting our coastline, communities and the environment.

Options appraisal

34. See section 21 to 27 above that outline options approach.

Consultation undertaken

35. Stakeholder engagement and consultation have been key to the Strategy's development. Since July 2021, four phases of engagement with key stakeholders, residents, and the wider community (including landowners, community groups, organisations and individuals) had sought to understand their aspirations and concerns, and to help shape the Strategy as it developed. The fifth phase of stakeholder communication was a formal 3-month public consultation on the draft leading options to manage the risk of coastal flooding and erosion and which closed in August 2023.
36. Engagement and consultation included face-to-face drop-in events, public online presentations with Q&A sessions, stakeholder workshops and surveys with a combination of traditional and online promotion. In total, over 12,000 people have viewed our website information, approximately 9,000 have engaged with our social media posts, around 730 people have attended our face-to-face and online events and 345 people have completed a survey. The table below outlines the engagement events undertaken throughout the strategy development.

	2021	2022		2023	
Event	Round 1	Round 2	Round 3	Round 4	Round 5
Public engagement (inc. online briefings & exhibitions)	July to August	May to June	July	Nov to Jan	June to Aug
Online Councillor briefings	8 th July 2021	18 th May 2022		21 st Nov	27 th June*
Councillor & officer drop in event (ATC)					23 rd Nov

* Link to youtube recoding of 27th June public briefing:

<https://www.youtube.com/watch?v=kNTisSoJ4bs+&feature=youtu.be>

37. In spring 2025 we intend to undertake a sixth round of communications to inform stakeholders about the final approved Strategy, explain what it means, and what the next steps are to begin to implement the Strategy in the areas identified as being those needing to be prioritised due to the immediacy of risk and/or condition of existing defences.
38. Alongside the 3-month public consultation, the draft Strategic Environmental Assessment, and Habitat Regulations Assessment, Water Framework Directive Assessment and Marine Conservation Zone Assessment have been consulted on with Statutory Consultees (i.e. Natural England, Historic England and the Environment Agency).
39. The feedback from this statutory consultation has been analysed and used to inform the selection of final leading preferred options that this paper is seeking approval of. The consultation report can be viewed as a background paper to this report.

Financial and resource implications

40. As identified above, following the current central government partnership funding rules means that the recommended leading strategic options do not qualify for full central government FCERM grant in aid (GiA) funding and will therefore need contributions from alternative sources to be delivered.
41. The current partnership funding mechanism encourages those benefiting from schemes to contribute to their cost to supplement government grants. By working together, schemes which are still viable but have less economic benefits would still be able to unlock national funding to boost and prioritise schemes to implement the Strategy. Raising sufficient funding will:

- Allow development and delivery of the recommended coastal defence schemes.
 - Increase the standard of protection of defences.
 - Improve the quality of materials used (e.g. to better fit the character of a location)
 - Increase certainty and accelerate the delivery of schemes.
 - Deliver wider benefits to communities associated with schemes, such as improved landscaping, access and public realm.
 - Deliver environmental enhancements to increase biodiversity.
42. Under these current funding rules, the scale of the funding contributions required over the next 100 years in cash terms across the NFDC area ranges from £88m - £99m, depending on which combination of recommended strategic options (national, local or backup) are eventually taken forward.
43. Over the next 20 years, the contributions required in cash terms are estimated to be between £39m - £50m; or £2.0m - £2.5m per year if annualized. Within the NFDC area, capital investments that comprise a significant proportion of the required contributions are needed as follows:

ODU	Likely timing of capital intervention to replace aged defences from year 0 (2024)	
	National Economic Leading Option	Local Aspirational Leading Option
14	5 -9 years	N/A – no local option defined
15	N/A – no capital intervention expected	N/A – no local option defined
16	35-39 years	5-9 years
17	35-39 years (refurbishment in year 5-9 years)	5-9 years
18	5-9 years	N/A – no local option defined

44. The balance of contributions required reflect the need for ongoing revenue expenditure by the asset owners to undertake maintenance works to ensure estimated defence life is provided to reach the anticipated replacement capital investment timing indicated above, as well as implementing property level protection in some ODUs for which other non-GiA funding sources may be available.
45. It should be noted that the level of funding contributions required are indicative and may change (up or down) as more work is undertaken to develop schemes and refinement of required works, costs, etc are

developed; as such these values act as a guide to the likely level of contributions that will need to be secured in the coming years to enable FCERM investments to occur in line with the leading options identified in this Strategy.

46. If these funding contributions are not achieved, then the Strategy in some areas identifies a back-up option that will provide a minimum amount of intervention to manage risks for a period of time, but that will eventually cease and the do-nothing scenario will become more likely, leading eventually to the scale of damages and loss described above.
47. In some cases, any intervention – even if funding can be secured – is unlikely to mitigate the long-term risks posed by climate change in terms of increasing risk of coastal flooding, erosion, and land sliding. Therefore, the measures set-out in this Strategy need to be considered as buying time and reflected in wider local planning policy with a view to the potential need for land-use adaptation longer-term (up to and beyond the 100-year horizon adopted in developing this Strategy).
48. The following tables illustrate the estimated timing of funding contributions required over the 100-year period in order to deliver the Strategy in the NFDC area as a whole, along with requirements for each Option Development Unit:

Leading Option	Option Overview (Epoch 1)	Epoch 1 Costs (£K)	Indicative GiA (£K & % amount)	Partnership Funding Required (£K)
Naish Cliff and Barton – on - Sea				
ODU 14 - National	Improve toe defences, cliff stabilization & drainage	27,165	3,215 (12%)	23,680
ODU 14 – Backup B	Maintenance works only in epoch 1	1,020	N/A	1,020
ODU 14 – Backup D	Maintenance works only in epoch 1	1,020	N/A	N/A
ODU 14 – Backup Maintain	Maintenance with some refurb	6,126	N/A	N/A
Cliff Road				
ODU 16 - National	Maintenance works only in epoch 1	392	N/A	N/A
ODU 16 – Local	Beach recharge & rock structure construction	5,032	1,301 (26%)	3,731
ODU 16 - Backup	Maintain existing defences and undertake beach recycling (reliant on recharge in other units). In the long term this is likely to lead to more erosion than the Managed Realignment options.	785	N/A	N/A
Rook Cliff				
ODU 17 - National	Refurbishment of existing defences	3,986	N/A	3,986
ODU 17 – Local	Improve defences	13,825	2,400 (17%)	11,425
ODU 17 - Backup	Maintain toe defences	3,985	N/A	3,985
Milford – on- Sea				
ODU 18 - National	Seawall repairs, control structures & small scale recharge	11,964	1,355 (11%)	10,609
ODU 18 – Backup B	Refurb existing defences & beach recharge. Major works in epoch 2	5,301	N/A	5,301
ODU 18 - Maintain	Ongoing beach management, refurb of defences & beach recharge	6,752	N/A	6,752

Leading Option	Description	Indicative non-GiA funding contribution required (£k) – cash*															Total
		Epoch 1 (years)				Epoch 2 (years)						Epoch 3 (years)					
		0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70-79	80-89	90-99	
National		1,206	7,180	30,044	507	870	786	4,493	22,961	659	659	3,584	15,413	1,568	7,193	1,550	98,673
Local**	(With National where no Local)	1,206	17,880	30,083	546	659	659	6,040	659	659	659	7,986	13,739	1,568	4,465	1,553	88,361

*Indicative funding for major capital scheme in option (if multiple capital schemes, not all have been assessed).

**Local option funding does not include GiA for ODUs 14 and 18 even though some could be available. This is because the BCR for the local option in these ODUs is <1, and it is uncertain if it will be viable to proceed with these if funding contributions are not forthcoming

Legal implications

49. The works required to implement the Strategy recommended leading options are undertaken under permissive powers granted to BCP and NFDC under the Coast Protection Act 1949 and Land Drainage Act 1991, and the Environment Agency under the Water Resources Act 1991. However, there is no statutory legal duty on these authorities to undertake these schemes if there is no justification and/or insufficient funding to do so.

Risk assessment

50. No formal risk assessment is required for the adoption of this strategy.
51. As detailed within the recommendations the adoption of the strategy does not commit NFDC to the provision of any funding to support the preferred delivery option.
52. Key risks have been identified with regard to flood and erosion risk to assets within the strategy area that will occur with non – delivery of the options for each ODU.

Environmental / Climate and nature implications

53. As part of developing the Strategy, a Strategic Environmental Assessment (SEA) has been undertaken. This has considered the implications of the range of technical options considered against a range of topics, objectives, and assessment questions, known as the SEA framework, to determine the sustainability of options in relation to: biodiversity and geodiversity; climate change; landscape; historic environment; land, soil and water resources; population and communities; and transport and movement.
54. In undertaking the SEA assessment, consideration has included whether options offer the potential for biodiversity net gain or other environmental enhancements. The full SEA environmental report can be viewed as one of the background papers to this report, and the findings of the SEA have informed the selection of the leading preferred options.
55. The SEA has been consulted on with statutory consultees including Natural England and Historic England, who have also provided letters of support (and they can be viewed as background papers to this report).
56. A key outcome of the SEA, alongside informing selection of more sustainable leading options, is to identify monitoring requirements to implement in the near future in order that improved data is provided

to inform decision making as schemes to implement the Strategy are developed in future years.

57. Alongside the SEA, a Habitat Regulations Assessment (HRA), Marine Conservation Zone (MCZ) Assessment and Water Framework Directive (WFD) Assessment have also been completed and agreed with the respective statutory consultees.
58. The HRA Stage 1 (Screening) identified potential for significant impacts on qualifying designated features associated with SAC and SPAs in the Strategy area. The HRA Stage 2 (Appropriate Assessment) considered these aspects in greater detail and concluded that mitigation will in the main be possible by only undertaking future works at specific times of year / states of water level – aspects that will need to be taken into account as and when detailed scheme designs are developed in future years to implement the Strategy. The HRA did not identify any requirement to provide compensatory habitat to mitigate any potential coastal squeeze impacts by continuing to defend areas against coastal flood and erosion risk.
59. The MCZ and WFD Assessments concluded that there are some potential limited, temporary impacts of construction works in relation to increased sediment turbidity but no longer-term impacts of the proposed strategic options. These potential impacts will need to be considered further when detailed scheme designs are developed in future years to implement the Strategy.

Equalities implications

60. NFDC Equality Impact Assessment completed 25th April 2024. No impacts were identified as a result of the assessment.

Crime and disorder implications

61. None identified.

Data protection / Information governance / ICT implications

62. None identified.

Conclusion

63. The Strategy's recommended leading options identify where and when potential defence schemes can be implemented along the frontage but identifies a significant funding challenge in order to deliver the national and/or local options.

64. In some cases, any intervention – even if funding can be secured – is unlikely to mitigate the long-term risks posed by climate change in terms of increasing risk of coastal flooding, erosion and landsliding. Therefore, the measures set-out in this Strategy need to be considered as buying time and reflected in wider-Local Planning policy with a view to the potential need for land-use adaptation longer-term (up to and beyond the 100-year horizon adopted in developing this Strategy).
65. Place & Sustainability Panel recommended that Cabinet agree to the report recommendations as set out in the panel report on 18th July 2024.

Appendices

Appendix 1 - Strategy Appraisal Report

Appendix 2 – Strategy Action Plan

Background Papers:

Strategic Environmental Assessment (SEA) for the Christchurch Bay & Harbour FCERM

Natural England and Historic England letters of support

Phase 5 Consultation

Link to strategy website:
[Christchurch Bay and Harbour FCERM Strategy 2021-2024 - Poole & Christchurch Bays Flood and Coastal Erosion Risk Management \(twobays.net\)](#)

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Strategy Appraisal Report

Authority scheme reference	WXC500E/001A/ 675A
----------------------------	-----------------------

Defra/WAG LDW number	LDW 42765
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Promoting authority	Bournemouth, Christchurch and Poole Council / New Forest District Council
---------------------	---

Strategy name	Christchurch Bay & Harbour FCERM Strategy
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Aerial photograph of flooding in Christchurch Harbour and the lower River Avon (BCP Council, January 2023)

Date	25/05/2024
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Version	V1
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StAR for *Christchurch Bay & Harbour FCERM Strategy*

Version	Status	Signed off by:	Date signed	Date issued
1	Version issued to BCP / NFDC for approval			

Template version – April 2011

Title	Christchurch Bay and Harbour FCERM Strategy					
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Appendix M	WFD Report
Appendix N	MCZ Assessment Report
Appendix O	Natural England and Historic England Letters of Support
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For technical approval of the business case
Environment Agency Region:

Project name:

Approval Value: £

Sponsoring Director: David Jordan Director of Operations

Non-financial scheme of delegation

Part 11 of the Non-financial scheme of delegation states that approval of FCERM Strategies/Complex Change Projects, following recommendation for approval from the Large Projects Review Group, is required from the Regional Director or Director, Wales and Director of Operations.

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Approval history sheet

APPROVAL HISTORY SHEET (AHS)			
1. Submission for review (to be completed by team)			
Project Title: Christchurch Bay and Harbour FCERM Strategy		Project Code: WXC500E/001A/675A	
Project Manager: Alan Frampton		Date of Submission: 01/05/24	
Lead Authority: Bournemouth, Christchurch and Poole Council (BCP)		Version No: v1	
Consultant Project Manager: Ben Taylor		Consultant: AECOM	
<i>The following confirm that the documentation is ready for submission to PAB or LPRG. The Project Executive has ensured that relevant parties have been consulted in the production of this submission.</i>			
Position	Name	Signature	Date
Project Executive			
	Job Title:		
2. Review by: Large Projects Review Group (LPRG)			
Date of Meeting(s):		Chairman:	
Recommended for approval: In the sum of £:		Date:	Version No:
3. Environment Agency NFSoD approval <i>Officers in accordance with the NFSoD.</i>			
Version No:		Date:	
Project Approval	By: In the sum of: £	Date:	
4. Defra or WAG approval <i>(Delete as appropriate)</i>			
Submitted to Defra / WAG or Not Applicable (as appropriate)		Date:	
Version No. (if different):			
Defra/ WAG Approval: or Not applicable (as appropriate)		Date:	
Comments:			

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**NON FINANCIAL SCHEME OF DELEGATION (NFSoD) COVERSHEET FOR A FCRM
COMPLEX CHANGE PROJECT / STRATEGIC PLAN**

1. Project name				Start date	
				End date	
Business unit			Programme		
Project ref.		Regional SoD ref.		Head Office SoD ref.	-

2. Role	Name	Post Title
Project Sponsor		
Project Executive		
Project Manager		

3. Risk Potential Assessment (RPA) Category	Low	<input type="checkbox"/>	Medium	<input type="checkbox"/>	High	<input type="checkbox"/>
---	-----	--------------------------	--------	--------------------------	------	--------------------------

4. NFSoD value	£k
Whole Life Costs (WLC) of Complex Change Project / Strategic Plan	

5. Required level of Environmental Impact Assessment (EIA)	N/A	Low	Medium	High
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. NFSoD approver name	Post title	Signature	Date
	Regional Director/Director Wales		
	Director of Operations		
NFSoD consultee name	Post title	Signature	Date
	LPRG Chair		

1 Executive summary

1.1 Purpose of this Report

- 1.1.1 This report is the Strategy Appraisal Report (StAR) for the Christchurch Bay and Harbour Flood and Coastal Erosion Risk Management (FCERM) Strategy.
- 1.1.2 The Strategy sets out the leading options, adaptive pathways and timings to sustainably address coastal flood and erosion risk over the next 100 years for the 13km coastal frontage between Hengistbury Head Long Groyne and the landward end of Hurst Spit, and 14km of shoreline within Christchurch Harbour, extending to Tuckton Bridge on the River Stour and Knapp Mill on the River Avon.

1.2 Background

- 1.2.1 The Strategy frontage is highly varied and ranges from a sheltered environment within Christchurch Harbour and an exposed open coast environment with beaches and steep cliffs within Christchurch Bay. It contains a mix of developed residential and commercial areas with the coastal towns of Christchurch, Barton on Sea and Milford on Sea. There are also areas of open space and sites of environmental significance across much of the frontage.
- 1.2.2 Much of the Strategy frontage is fronted by coastal defence structures that help to manage coastal flooding and erosion risks. The defences are typically owned and maintained by the Environment Agency, Bournemouth, Christchurch and Poole Council (BCP) and/or New Forest District Council (NFDC) but there are also sections of privately owned and maintained defences. Many of the defences are ageing and have a limited residual life before needing to be replaced or improved.
- 1.2.3 Beach management is also a key method in which the coastal flooding and erosion risks are managed within the bay. This occurs on a frequent basis (annually in some locations such as at Milford on Sea) and takes the form of either beach recycling or small-scale beach renourishment.
- 1.2.4 There are significant coastal flooding and erosion risks facing the Strategy frontage over the next 100 years which are projected to increase in severity due to climate change and sea level rise. Higher sea levels and increased storminess will reduce the performance and standard of protection provided by existing coastal defences.
- 1.2.5 In the Strategy area there are estimated to be 120 properties (total residential and non-residential) currently at risk from coastal flooding from a 1 in 200 return period event (0.5% Annual Exceedance Probability - AEP). Due to climate change and sea level rise, this number is projected to increase to 2,227 properties for the 1 in 200 (0.5% AEP) return period in 100 years' time.
- 1.2.6 There are estimated to be 1,365 properties (total residential and non-residential) at risk of coastal erosion over the next 100 years if nothing is done to manage the risk. Several historic landfill sites are also at risk of erosion in the future.
- 1.2.7 The 'Do Nothing' economic damages from the flooding and erosion risk have been calculated for the Strategy frontage for the next 100 years. Damages to the national economy are estimated to be over £186million in present value (PV) terms and

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£1,213million in undiscounted cash terms, with the damages concentrated in Christchurch Harbour, Christchurch Beaches and Cliffs, Barton on Sea and Milford on Sea.

- 1.2.8 Under the Do Nothing scenario there are also expected to be wider damages to the local economy from the flooding and erosion risks, such as the Gross Value Added damages, potential damages to tourism, health and wellbeing and council revenue. These local economic damages far exceed the national damages over the duration of the appraisal period.
- 1.2.9 There is currently no existing strategy in place to provide a framework for the long term management of the coastline and to deliver the higher level management policies of the Poole and Christchurch Bay Shoreline Management Plan 2 (2011). Currently defence maintenance and improvements are undertaken on a reactive basis governed largely by the availability of Local Authority revenue budgets or through applications for emergency FCERM Grant in Aid following asset failures.
- 1.2.10 A Strategy is required to set out a plan for managing the flooding and erosion risks facing the Strategy frontage in a cohesive and joined-up way. The Strategy sets out the leading options, adaptive pathways and trigger thresholds and the estimated investment that is required. If approved by the Environment Agency, the Strategy will demonstrate that strategic planning has been undertaken which will improve the case for attracting funding for future schemes from FCERM Grant in Aid and also from non-Grant in Aid contributions.

1.3 Options Considered

- 1.3.1 In order to manage the risks posed by coastal flooding and erosion over the next century, a range of Strategic Options were considered across 18 Option Development Units (ODUs). Each ODU covers a different part of the Strategy frontage and the strategic links between areas were considered. See Figure 4-1 for a map of the ODU locations.
- 1.3.2 The Strategic Options were developed and appraised in line with the updated Defra’s Flood and Coastal Erosion Risk Management Appraisal Technical Guidance (FCERM-ATG, 2022), originally published in 2010 (FCERM-AG, 2010) and then updated in 2022.
- 1.3.3 The Strategic Options outline the intent of the interventions over the next 100 years, such as doing nothing, maintaining the defences, sustaining the defences, improving the defences or undertaking managed realignment.
- 1.3.4 The Strategic Options are made up of a ‘package’ of FCERM measures. The measures refer to the local level defences that would be constructed or maintained (e.g. a seawall, setback floodwall, beach recycling etc.). Often it is necessary to combine a variety of these measures into a ‘package’ and therefore strategic options generally include a combination of FCERM measures that would be implemented over time to deliver the option.

1.4 Leading Options and Adaptive Pathways

- 1.4.1 Within each ODU up to three types of leading option have been identified, as follows:
 - National Leading Option – the leading option identified by following FCERM-AG decision rules;

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- Local Aspirational Option – an option that takes into account local opportunities, wants, and needs to deliver greater or wider benefits. The Local Aspirational Option is typically a higher cost than the National Leading Option.
- Backup Option – an option that is more deliverable from a funding perspective than either the National Leading Option or the Local Aspirational Option. Backup Options typically have lower present value costs and smaller capital funding requirements but deliver less benefits.

1.4.2 With multiple leading options identified, the Strategy has the required flexibility to move between the leading options as it is being implemented over the next 100 years. The different routes that can be followed between implementing the options are known as ‘adaptive pathways’. This approach increases the adaptive capacity of the Strategy and provides the required flexibility that is required to account for uncertainties such as rates of climate change, funding availability, project costs, potentially contaminated land, land ownership, consenting and future development.

1.4.3 A summary of the leading options is provided below:

- In ODUs 1 and 2 (Hengistbury Head and Mudeford Sandbank) it is important to sustain the FCERM function of the Mudeford Sandbank as uncontrolled erosion / movement of Mudeford Sandbank could have uncertain impacts on the wider morphology of the area, potentially impacting flood risk, navigation, sediment transport and buried services in the vicinity. The Local Aspirational Options for this location are focussed on maintaining the existing FCERM function of the Sandbank over the course of the appraisal period. On a national basis there is not a strong economic case to deliver the Local Aspirational Options in ODUs 1-2, but it is important for these to be delivered to ensure the leading options in ODUs 3-10 are successful.
- In ODUs 3-10 (Christchurch Harbour) the main risk is from tidal flooding to properties and other assets. Where there is an economic case, the leading options are generally focussed on upgrading the SoP provided by defences in these locations. This could be achieved by raising existing defences or constructing new defences as required. Different timings are recommended for defence upgrades based on a range of factors such as the onset of risk and the residual life of existing defences. Another risk in ODUs 3-10 is historic landfill sites and the potentially contaminated materials that could be exposed should these locations be undefended and erode. The different approaches to managing this risk (with respect to timings and cost) have been explored in the appraisal and are picked up in the leading options.
- In ODU 11 (Mudeford Quay) it is important to sustain the FCERM function of the existing quay walls as erosion / damage to the quay could lead to more widespread morphological changes and impact flood risk elsewhere in the area. The Local Aspirational Option in this location aims to prevent the quay from eroding and provides property level protection to the properties on the quay at risk from flooding. Similar to ODUs 1 and 2, on a national basis there is not a strong economic case to sustain the function of the quay walls in ODU 11, but it is important for the function of these assets to be continued to ensure the leading options in ODUs 3-10 and ODU 12 can be delivered successfully.
- In ODUs 12-18 (Christchurch Bay open coast), the leading options are underpinned by a series of strategically placed beach nourishment interventions over time. The placement locations have been identified to provide an immediate benefit to the placement location but also to provide a long term benefit to areas downdrift over the Strategy period, including Hurst Spit. The leading options recommend beach

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nourishment is undertaken in ODU 12, ODU 13, ODU 16 and ODU 18 at various points over the next 100 years. There is an opportunity to explore a joined-up approach to scheme delivery in these locations which could deliver efficiencies. The beach nourishment will ensure that the beach can continue to provide an integral part of the overall defence system along the open coast. However, in some locations it would need to be supplemented with additional hard defence structures and cliff slope stabilisation. For example at Barton on Sea (ODU 14) new cliff toe defences and cliff slope drainage is recommended and new hard defences at Milford on Sea (ODUs 16-18) are also recommended.

1.5 Economic and Funding Case

- 1.5.1 It is estimated that the total whole life present value cost of delivering the Strategy is approximately £140million over the next 100 years. This value is in present value terms and therefore includes a discount for the cost of future interventions that are required over the next 100 years. In undiscounted cash terms, the total whole life cost of the delivering the Strategy is estimated to be approximately £313million.
- 1.5.2 On a national basis, the total whole life present value benefits of delivering the Strategy are estimated to be approximately £168million. These are the benefits that would occur due to a reduction in flood and erosion risk compared to the baseline 'Do Nothing' scenario.
- 1.5.3 Across the Strategy frontage as a whole, the whole life present value economic benefits (£168million) exceed the estimated whole life present value costs (£140million). However, in some individual ODUs the average benefit cost ratio of the leading option is less than unity. But this is only the case when considered on a national basis (i.e. only considering nationally eligible benefits as per the FCERM-AG). As part of the Strategy, the wider local impacts of flooding and erosion in each ODU have also been calculated and when these damages (and potential benefits) are considered, this results in a much stronger economic case of the options on a local economic basis for each ODU.
- 1.5.4 For each of the leading options (National / Local Aspirational options), Partnership Funding calculations have been undertaken for the initial schemes of these options using the Environment Agency's Partnership Funding calculator. The score for the initial schemes is typically less than 50%. This indicates that significant funding contributions from non FCERM-Grant in Aid sources will need to be found to deliver the Strategy.
- 1.5.5 Typically the initial schemes are not recommended to occur for several years at least (with many recommended to occur even later during epoch 2 / 3). This provides the BCP / NFDC FCERM teams with time to source funding contributions and one of the recommendations following the Strategy is to develop a funding action plan to plan, identify and secure contributions before schemes are required.
- 1.5.6 A Strategy Action and Implementation Plan has been developed. This plan includes details of the triggers and thresholds to inform key FCERM decisions and movement through the adaptive pathways in each ODU. This includes decision tree illustrations for the adaptive pathways.

1.6 Strategic Factors

Future uncertainty

- 1.6.1 There is uncertainty around the magnitude of future climate change and sea level rise and the availability of funding for FCERM projects in the future. It has therefore been

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imperative that the Strategy does not set a rigid intervention approach that cannot be changed in the future.

- 1.6.2 Following the adaptive pathway approach the Strategy leading options have been developed with sufficient flexibility to move between leading options as required when the Strategy is delivered, subject to the evolution of the key uncertainties over time. Switching pathways between the leading options will not compromise the approach in adjacent areas.

Beach sediment transport

- 1.6.3 The role of coastal processes and beach sediment transport within Christchurch Bay is a critical strategic issue because the beach volume is a key influence on rates of coastal erosion. The dominant longshore transport direction within the Bay is from west to east. Some parts of the Strategy frontage have sufficient beach material (e.g. Highcliffe which has effective beach control structures), whereas other parts of the frontage do not have enough material (e.g. Milford on Sea).

- 1.6.4 In developing the Strategy the knock-on impact on longshore sediment transport from the proposed options has been fully considered and a series of beach nourishment interventions within the bay are proposed as part of the leading options. The joined up strategic planning undertaken as part of the option appraisal is essential for the long term sustainable management of the erosion risk facing the bay and this strategic planning is not always prevalent when FCERM interventions are developed on a scheme by scheme basis without a Strategy in place.

Historic landfill

- 1.6.5 A key strategic concern for the Strategy is the erosion risk to historic landfill sites of which there are several around Christchurch Harbour, including at Stanpit, Wick, the Quomps and Mundeford Quay. Erosion could release potentially contaminated materials into the environment. The contamination status of the historic landfill sites is unknown so more work is needed after the Strategy to investigate this risk further. In the option development and appraisal the Strategy has taken a conservative stance and recommended defending historic landfill sites as part of the leading options and adaptive pathways.

- 1.6.6 There is a recognition that on a national basis protecting historic landfill sites does not typically attract sufficient FCERM-GiA and therefore additional sources of funding will need to be sought and investigated to facilitate the delivery of these works.

Hurst Spit

- 1.6.7 Hurst Spit is located at the eastern end of the Strategy frontage and forms a vital controlling feature for the morphological evolution of Christchurch Bay. In developing the Strategy the project team has collaborated with the Hurst Spit to Lympington FCERM Strategy team. It is understood that various options for managing Hurst Spit in the future are being considered by the Hurst Spit to Lympington Strategy, including controlled rollback.

- 1.6.8 The role of beach management within Christchurch Bay has an influence on the future of the spit, as FCERM actions in the bay will influence how much material the Spit will naturally receive. Many of the leading options for the Christchurch Bay and Harbour Strategy involve beach nourishment / management and depending on the level of nourishment and the extent of recycling activities, it would be expected to increase the feed of material to Hurst Spit over time, relative to this situation today. The leading options for the Strategy have been discussed with the Hurst Spit to Lympington team and more details of the interaction between the leading options and Hurst Spit are provided in section 6.7.

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- 1.6.9 The potential coastal process impacts of the rollback of the spit are uncertain and potentially wide ranging across Christchurch Bay and also the Solent area. The existing coastal processes allow the formation of offshore banks (such as Shingles Bank and Dolphin Sands) and influence the sediment distribution patterns observed within the bay.
- 1.6.10 A working assumption from both projects is that the large rock revetment at the base of Hurst Spit (landward end) will be held in place over the duration of the Strategies. This will provide an anchor point for both the Spit and also for Milford on Sea and the options have been developed in this Strategy on this basis. However, if managed rollback of the spit is the leading option that is identified in the Hurst Spit to Lymington Strategy, it will be important to fully understand the coastal processes implications of the rollback and to manage the rollback accordingly so that it does not threaten the rock revetment transition point or have significant negative impacts on wider coastal processes within the area.

Environmental considerations

- 1.6.11 The majority of the frontage is environmentally sensitive and is internationally and nationally designated.
- 1.6.12 The Strategy has taken account of the potential impacts on the environment, and the potential environmental opportunities through the development of a Strategic Environmental Assessment, Habitats Regulations Assessment, Water Framework Directive Assessment and Marine Conservation Zone Assessment.
- 1.6.13 Where potential environmental impacts have been identified, the environmental assessments have identified appropriate mitigation measures and recommendations for scheme level appraisal (such as identifying appropriate alignments for new defences during design). Areas where there could be opportunities to create new habitats or improve existing habitats have also been identified around Christchurch Harbour.
- 1.6.14 Historic England and Natural England have reviewed the relevant environmental assessments (Historic England reviewed the SEA, Natural England reviewed the SEA, HRA and MCZ assessment) and have provided letters of support for the Strategy and the recommendations.

1.7 Implementation

- 1.7.1 The Strategy promotes and supports long term, sustainable adaptive management of the coastal flooding and erosion risks in Christchurch Bay and Harbour over the next 100 years. The Strategy has set out the leading options for each ODU and in order to implement these options a series of phased capital interventions and scheduled maintenance is required. This work needs to be planned ahead of time through the development of business cases. Ongoing engagement with stakeholders and communities will be required to manage the risks and consequences of flooding and erosion and to build support for FCERM interventions.
- 1.7.2 Table 1-1 below outlines the indicative programme and key dates for all defence upgrades outlined in the Strategy leading options over the first 20 years of the Strategy. Delivery of these upgrades will be subject to acquiring the required funding and reaching the trigger thresholds set out in the Action and Implementation Plan.

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Table 1-1: Indicative key dates for defence upgrades over the next 20 years, subject to acquiring suitable funding and adaptive pathways / trigger thresholds

Activity	Date
ODU 3 (verge / slope armouring to historic landfill) Historic landfill / contaminated land investigations Commence detailed appraisal Approval Construction start Construction completion	2026 2028 2030 2031 2032
ODU 4 (lengthening / raising defence embankment) Commence detailed appraisal Approval Construction start Construction completion	2030 2032 2033 2035
ODU 5 (frontline / setback defence improvements) Commence detailed appraisal Approval Construction start Construction completion	2026 2029 2030 2032
ODU 12 (beach nourishment, groyne / seawall improvement) Commence detailed appraisal Approval Construction start Construction completion	2033 2035 2036 2038
ODU 13 (outflanking defence) Commence detailed appraisal Approval Construction start Construction completion	2033 2035 2036 2038
ODU 14 Drainage trial and analysis Commence detailed appraisal Approval Construction start Construction completion	2025 2028 2032 2033 2035
ODU 16 Commence detailed appraisal Approval Construction start Construction completion	2026 2029 2030 2032
ODU 17 Commence detailed appraisal Approval Construction start Construction completion	2026 2029 2030 2032
ODU 18 Commence detailed appraisal Approval Construction start Construction completion	2026 2029 2030 2032

1.8 Strategy Plan

1.8.1 Figure 1-1 presents a plan of the Strategy frontage showing the intent of the leading options in each location. The intent of the leading options are determined from the Local Aspirational Option and/or National Option where a Local Aspirational Option does not exist.

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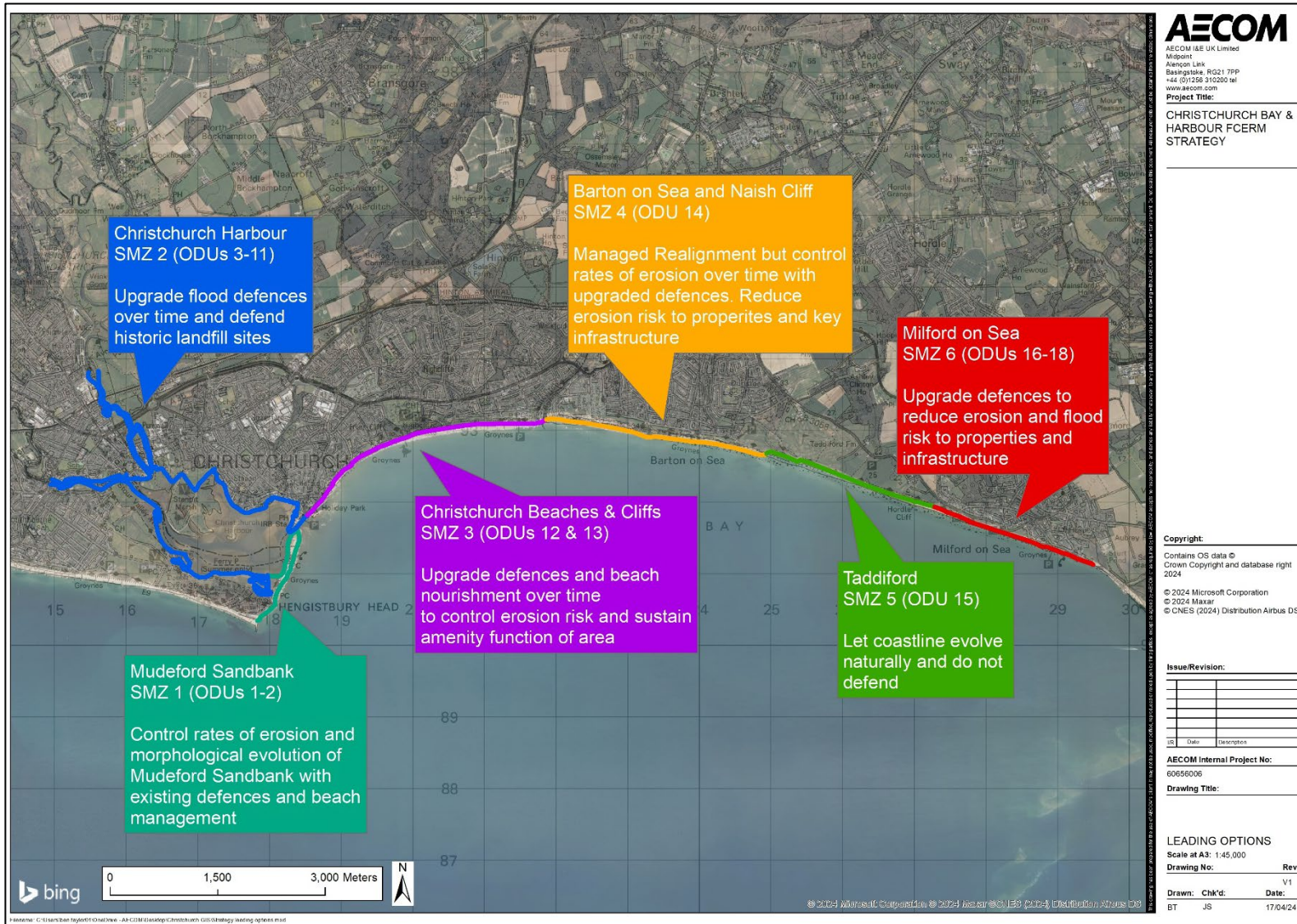


Figure 1-1: Strategy plan showing leading options in each location

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2 Introduction and background

2.1 Purpose of this report

- 2.1.1 This report is the Strategy Appraisal Report (StAR) for the Christchurch Bay and Harbour Flood and Coastal Erosion Risk Management (FCERM) Strategy, herein referred to as ‘the Strategy’. The Strategy area is within the jurisdiction of Bournemouth, Christchurch and Poole Council (BCP) and New Forest District Council (NFDC) and has been collaboratively developed with both councils, with support from the Environment Agency (EA) and other key stakeholders. Technical support has also been provided from engineering consultant AECOM.
- 2.1.2 The Strategy sets out the leading options, adaptive pathways and timings for FCERM within the Strategy area over the next 100 years. The leading strategic approaches have been developed to sustainably manage the coastal flood and erosion risk between Hengistbury Head (immediately to the east of Hengistbury Head long groyne) and the landward (western) end of Hurst Spit, and encompassing the predominantly tidal flood risk area within Christchurch Harbour.
- 2.1.3 The Strategy has been developed in accordance with the updated Defra’s Flood and Coastal Erosion Risk Management Appraisal Technical Guidance (FCERM-ATG, 2022), originally published in 2010 (FCERM-AG, 2010) and then updated in 2022, supplementary documents and associated EA policies and procedures.
- 2.1.4 The purpose of this report is to seek approval of the Strategy by the Environment Agency, but no financial contributions are being sought at this time.

2.2 Background

Strategic and legislative framework

- 2.2.1 The Strategy coastline is within the area covered by the Poole and Christchurch Bay Shoreline Management Plan 2 (SMP2) (2011). The SMP provides a large-scale assessment of the coastal flooding and erosion risks between Durlston Head and Hurst Spit, including the areas of Bournemouth, Poole and Christchurch Bay. The SMP presents a policy framework to address the risks to people, the developed, historic, and natural environment.
- 2.2.2 The SMP2 policies vary along the Strategy frontage, with the most frequent policies being ‘Hold the Line’ and ‘Managed Realignment’. Table 2-1 below presents the SMP2 policies along the Strategy frontage. To facilitate the development of the Strategy, the frontage has been divided into six ‘Strategy Management Zones’ (SMZs) and then further sub-divided into eighteen ‘Option Development Units’ (ODUs). The SMP2 policies for each of the ODUs are provided in the table.

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Table 2-1: Overview of SMP2 policies along the Strategy frontage

Location	Summary of SMP2 policies
SMZ 1: Mudeford Sandbank	ODU 1 (Hengistbury Head east): Managed Realignment ODU 2 (Mudeford Sandbank): Hold the Line into Managed Realignment
SMZ 2: Christchurch Harbour	ODU 3 (Christchurch Harbour South): No Active Intervention ODUs 4-6 (Wick, Willow Drive / Quomps, River Avon West Bank): Hold the Line ODUs 7-8 (Rossiters Quay / River Avon East Bank): No SMP policy* ODU 9 (Stanpit): Hold the Line into Managed Realignment ODU 10 (Mudeford): Hold the Line, Managed Realignment then Hold the Line ODU 11 (Mudeford Quay): Hold the Line
SMZ 3: Christchurch Beaches and Cliffs	ODUs 12-13 (Avon Beach, Highcliffe): Hold the Line
SMZ 4: Naish Cliff and Barton on Sea	ODU 14 (Naish Cliff and Barton on Sea): Managed Realignment
SMZ 5: Taddiford	ODU 15 (Barton on Sea to Hordle Cliff): No Active Intervention
SMZ 6: Milford on Sea	ODU 16 (Cliff Road): Managed Realignment ODU 17 (Rook Cliff): Hold the Line ODU 18 (Milford on Sea): Hold the Line into Managed Realignment

**No SMP policy in ODUs 7-8 as area is upstream along the River Avon and outside of SMP extent*

2.2.3 The Strategy frontage includes, or is adjacent to, a variety of sensitive environmental receptors and designations. Therefore the Strategy has taken into consideration the requirements of the Environment Act (1995, 2021) and undertaken several environmental assessments, including:

- Strategic Environmental Assessment (SEA);
- Habitats Regulations Assessment (HRA);
- Water Framework Directive (WFD) Assessment; and
- Marine Conservation Zone (MCZ) Assessment.

2.2.4 The various environmental assessments carried out during the development of the Strategy have formed an integral part of the option development and appraisal process. The various environmental assessments can be found in Appendices K to N, and are summarised in Section 5.2.

2.2.5 In developing the Strategy, the project team has liaised with teams from adjacent plans and strategies that are also currently in development. This has ensured that the Strategy does not contradict or hinder the delivery of other or future FCERM plans for the wider area. Liaison and alignment with the following adjacent projects / teams has occurred;

- Hurst Spit to Lymington FCERM Strategy (led by the Environment Agency);
- Hengistbury Head Long Groyne Refurbishment project (led by BCP);
- Barton on Sea Cliff Drainage Trial Scheme (led by NFDC);
- The Durlston to Hurst Sediment Resource Management Programme; and
- The Lower Stour Strategy and the Lower Avon and Harbour Modelling project (led by the Environment Agency Partnership Strategic Overview team).

2.2.6 Given the importance of Hurst Spit on the morphology of Christchurch Bay and the wider Solent area, frequent liaison, and communication with the Hurst Spit to Lymington FCERM Strategy project team was particularly important to develop a cohesive solution. Both project teams met monthly during the development of the Strategy and discussed the interaction and alignment between the two Strategies during option development. For

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the public consultation phase of engagement, the two projects delivered a joined-up engagement event for the public.

Previous studies

2.2.7 In addition to the SMP2, there have been a number of key supporting technical studies previously undertaken within the Strategy frontage and the adjacent areas that have been referred to in development of the Strategy, as summarised below.

Christchurch Bay and Harbour FCERM Study (2012)

2.2.8 This Study developed a coastal flood and erosion risk management strategy for the Strategy frontage in 2012, however, this was not formally adopted by BCP / NFDC or approved by the Environment Agency.

Hurst Spit to Hengistbury Head Annual Survey Report (Southeast Regional Coastal Monitoring, 2021-2023)

2.2.9 The Southeast Regional Coastal Monitoring Programme collects beach profile and volume data along the Strategy coastline at regular intervals. This information has fed into the option development and appraisal and helped determine areas where beach nourishment is likely to be required / effective.

Poole Bay Beach Management Scheme 2015-2032

2.2.10 Poole Bay stretches from the Sandbanks in the west to Hengistbury Head in the east and is adjacent to the Strategy area. The beach management in Poole Bay has the potential to impact sediment transport into Christchurch Bay and therefore this scheme has been considered when developing the baseline and options for the Strategy.

Mudford Sandbank Beach Management Plan (HR Wallingford, 2001)

2.2.11 The Mudford Sandbank Beach Management Plan outlines monitoring requirements and suggested interventions for beach renourishment and regrading.

Social and political background

2.2.12 The Strategy frontage extends across two local authority jurisdictions; BCP in the west and NFDC in the east. The boundary between the two local authority areas is at Chewton Bunny, just to the east of the Highcliffe coastal defences (see Figure 2-1). It was important for the Strategy to be developed in unison across both political areas to ensure a cohesive and joined-up approach to managing the coastal processes within Christchurch Bay.

2.2.13 The Strategy has been developed in close collaboration with key personnel, officers and political representatives from both BCP and NFDC Councils which was achieved via a robust project Governance Structure. Regular briefings with members of the Councils, including the elected members, were held at key stages of the Strategy development to minimise political risks and build support.

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Location and designations

Geographical location

- 2.2.14 As shown in Figure 2-1, the Strategy area encompasses the 13km coastal frontage between Hengistbury Head Long Groyne and the landward end of Hurst Spit. The frontage also includes approximately 14km of shoreline within Christchurch Harbour, extending to Tuckton Bridge on the River Stour and Knapp Mill on the River Avon.
- 2.2.15 At the western end of the Strategy frontage at Hengistbury Head, the long groyne acts as a man-made barrier to sediment transport into Christchurch Bay (although there is some bypassing of material). The beach to the west of Hengistbury Head is managed through the Poole Bay Beach Management Scheme (2015-2032) and aims (in part) to reduce coastal erosion and prevent a breach forming from Poole Bay into Christchurch Harbour.
- 2.2.16 The eastern end of the Strategy frontage is the rock revetment at the landward end of Hurst Spit. The management of the Spit is key to the overall morphology of Christchurch Bay (and the wider Solent area) and a long-term Strategy for managing the Spit is being developed by the adjacent Hurst Spit to Lymington FCERM Strategy (being led by the Environment Agency). Due to the importance of this Strategy for the future of Hurst Spit (and vice versa), there has been close collaboration between the two project teams throughout the development of both Strategies.
- 2.2.17 Along the River Avon and River Stour within Christchurch Harbour, the dominant source of flood risk within the Strategy boundary (downstream of Knapp Mill and Tuckton Bridge respectively) is from tidal flooding. Upstream of these locations the fluvial flood risk becomes more dominant.

Landscape and physical characteristics

- 2.2.18 The character of the frontage is highly varied from exposed open coast within the Bay to more sheltered areas within Christchurch Harbour. Natural geomorphological features within Christchurch Bay include Hurst Spit, Mudeford Sandbank and Hengistbury Head, each of which provides a controlling influence on the shape and planform of the coastline.
- 2.2.19 Christchurch Harbour is a naturally formed Harbour, sheltered to the south by Hengistbury Head and Mudeford Sandbank, with parts of the Harbour being reclaimed. The landscape throughout the harbour is comprised of marshes, heath and woodland. The historic town of Christchurch is located on the banks of the harbour and includes many cultural heritage designations and scheduled monuments. There are also areas of historic landfill / potentially contaminated land adjacent to the harbour.
- 2.2.20 Mudeford Sandbank is a low-lying sandy spit adjacent to Hengistbury Head. It provides shelter to Christchurch Harbour from wave activity and is a key area for visitors and tourism, with beach huts and a small number of businesses. The FCERM assets on the Sandbank include rock groynes and a rock revetment and regular beach recycling is undertaken. The entrance to Christchurch Harbour is at the end of the Sandbank and this is known as 'the Run'. It is highly dynamic from a sediment transport perspective and has fast tidal flows in what is a narrow channel.
- 2.2.21 The open coast part of the frontage between Mudeford Quay and Highcliffe is comprised of a mixed beach in front of low-lying vegetated cliffs. This area is also popular for tourism and amenity. The FCERM assets include groynes and seawalls.

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2.2.22 Between Highcliffe and Hordle the coast is comprised of a mixed beach in front of higher cliffs, reducing in elevation from west to east. The cliffs are actively eroding in places. Due to the sloping geological beds in the bay, the geology of the exposed cliffs changes along the frontage, with the cliffs at Barton on Sea particularly susceptible to erosion and land sliding. There are a variety of FCERM assets along this part of the frontage including rock groynes, a rock revetment and cliff drainage at Highcliffe and then rock groynes, a rock revetment and cliff drainage (in various states of repair) at Barton on Sea. These defences provide some protection to the urban areas located on the cliff top. Between Barton on Sea and Hordle Cliff the coastline is undefended.

2.2.23 At Milford on Sea, the land is lower lying and there is a risk of both flooding and coastal erosion. There are extensive FCERM assets in this area including groynes, a rock revetment, and a seawall / revetment. A key risk in this location is lowering beach levels that can lead to undermining of the defences and frequent small scale beach nourishments are undertaken here annually to top-up beach levels. Flooding can occur in this area from wave overtopping along the open coast as well as from tidal inundation / fluvial risk from Danes Stream. Milford on Sea is popular for tourism and amenity and includes disabled access.

Environmental Designations

2.2.24 There are local, national, and international environmental designations within or in proximity to the Strategy frontage. The key designations include;

- Four Special Areas of Conservation (SAC); the Solent Maritime, Dorset Heaths, Avon River and South Wight Maritime SACs;
- Four Special Protection Areas (SPA); Solent and Southampton Water, Dorset Heathlands, Avon Valley and the Solent and Dorset Coast SPAs;
- Two Ramsar sites; Avon Valley, and Solent and Southampton Water;
- Four Sites of Special Scientific Interest (SSSIs); Hurst Castle and Lymington River, Highcliffe to Milford Cliffs, Christchurch Harbour and the Avon River;
- Two Marine Conservation Zones; the Needles MCZ and Southbourne Rough MCZ;
- Five Local Nature Reserves; Stanpit Marsh, Hengistbury Head, Steamer Point, Milford-on-Sea and Sturt Pond;
- Eight scheduled monuments including the Multiperiod Landscape on Hengistbury Head and Christchurch Priory / Monastery;
- Numerous listed buildings including Christchurch Priory, Constable’s House, Town Bridge and Highcliffe Castle that are Grade I listed.

Social characteristics

2.2.25 The Strategy area encompasses four parishes; Christchurch, Highcliffe and Walkford, Milford on Sea and New Milton. The 2021 Census indicated that the population in these four parishes was approximately 75,000. The towns and villages to the east of Christchurch are mainly residential, with tourism and service industries providing the main form of employment. The settlements within the Strategy area typically have an older average population and are popular retirement destinations. The Index of Multiple Deprivation for England ranked the BCP and NFDC areas as 14,821 and 10,782 respectively out of a possible 32,884 (with 1 being most deprived and 32,884 being least deprived).

History of Flooding and Coastal Erosion

History of coastal flooding

2.2.26 The history of coastal flooding within the Strategy area is concentrated around the low-lying areas of Christchurch Harbour. Flooding has also occurred at Milford on Sea from

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wave overtopping. Coastal flooding caused significant damage in the Strategy area in the winters of 2000/2001 and in 2013/2014 due to a high frequency of storms.

- 2.2.27 Within Christchurch Harbour the coastal flood risk is generally from tidal still water levels, added to by limited amounts of wind driven wave action under certain conditions. The exception is at Mudeford Quay which is adjacent to the Run (entrance to the harbour) and is more exposed to wave action. Here flooding occurs on a regular basis with waves overtopping the quay wall annually. The Rivers Avon and Stour also contribute to the flood risk within the harbour but the tidal component is the dominant source of risk in the Strategy area.
- 2.2.28 Coastal flooding has also recently occurred at the eastern end of Milford-on-Sea near the Hurst Road East Car Park. Here there are two sources of risk; from wave overtopping along the open coast and from tidal still water level flooding from the Sturt Pond direction where the land levels and defences are lower. The eastern end of Milford on Sea most recently flooded in 2014 when a high volume of wave overtopping the seawall caused seawater to flow onto Hurst Road, and the car park, causing internal flooding (up to 1m deep) in The Lighthouse
- 2.2.29 Outside of Christchurch Harbour and Milford on Sea, the rest of the open coast frontage within Christchurch Bay is characterised by steep topography and cliffs. Historically, coastal flooding to properties has therefore not been an issue (erosion is more of a concern). However, storms have led to damage to beach huts and services along the beach front; the February 2014 storms damaged beach huts at Avon Beach, washed away 80 timber beach huts at Hordle and destroyed 119 beach huts at Milford on Sea. Recently storms during 2024 have also led to beach hut damage at Hordle.

History of coastal erosion

- 2.2.30 Historically erosion has been a significant risk along much of the open coast frontage. The cliffs within Christchurch Bay are comprised of tertiary sands and clays (i.e. soft rock cliffs). The dip of the beds, their orientation and underlying geology has a significant bearing on the stability of the cliffs. Erosion of the soft rock cliffs is controlled by a range of factors, but exposure of the cliff toe to marine erosion is often the key process. In some parts of the frontage, for example, at Barton on Sea, the role of groundwater / rainfall in inducing cliff instability is also a key factor.
- 2.2.31 The cliff line is actively eroding in several locations within the Strategy frontage, including at Naish Cliff, Barton on Sea, Hordle Cliff & Rook Cliff. At Barton on Sea extensive cliff drainage and toe defences have been constructed in the past which have slowed the rate of erosion. However, due to the complex cliff geology in this location the erosion has not stopped entirely and has continued even with these defences in place. Other parts of the Strategy frontage, such as at Highcliffe, have successful cliff drainage and toe defences that have stabilised the cliff line. However, if these defences were to fail in the future, then erosion of the cliffs would be expected to continue.
- 2.2.32 Historically the cliff stabilisation schemes within the bay have been funded by BCP / NFDC. It is recognised that moving forward, land stabilisation measures are not typically eligible for FCERM Grant in aid funding and will therefore need to be funded through different sources.
- 2.2.33 Erosion and loss of beach material is also a concern along the open coast. Lowering beach levels can be linked with rates of erosion for soft cliffs and there is also a link between low beach levels and failure of sea defences due to undermining / toe exposure. Loss of beach material is a critical issue at Milford on Sea, with significant erosion of the

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beach since monitoring began in the year 2000. In 2020, a failure of the seawall occurred to the west of the White House and amongst the contributing factors was significant beach drawdown that led to the toe becoming exposed. Full analysis of beach levels in the Strategy area is provided in the Strategy Coastal Processes Report (Appendix Q).

2.3 Current Approach to Coastal Flood and Erosion Risk Management

Measures to manage the probability of coastal flooding and erosion risk

- 2.3.1 Much of the Strategy frontage is fronted by coastal defence structures. The structures vary in type and include both formal and informal defences. The defences are typically owned and maintained by the Environment Agency, BCP and/or NFDC. There are also sections of privately owned and maintained defences.
- 2.3.2 Beach management is also a key method in which the coastal flooding and erosion risks are managed within the bay. This occurs on a frequent basis (annually in some locations such as at Milford on Sea) and takes the form of either beach recycling or small-scale beach renourishment.
- 2.3.3 Some parts of the frontage are currently undefended and have a 'No Active Intervention' policy in the SMP2 so nothing is done to manage the risks.
- 2.3.4 Table 2-3 outlines the key types of defences and beach management activities within the Strategy area.

Table 2-2: Existing coastal defences and beach management

Location	Coastal defences	Beach management	Defence Owner / Maintainer
SMZ 1: Mundeford Sandbank	- Rock revetment, rock groynes, gabions and seawall	- Beach recycling, typically moving 1,000m ³ of material from the end of the Sandbank back to the groyne bays (undertaken on 8 occasions between 2002-2017)	BCP
SMZ 2: Christchurch Harbour	- Quay walls, setback, embankment, setback floodwall, seawall and rock armour. - Typically undefended in low population areas around the harbour, such as along the south side of the harbour	- No beach management within the harbour	BCP, Environment Agency, Private

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Location	Coastal defences	Beach management	Defence Owner / Maintainer
SMZ 3: Christchurch Beaches and Cliffs	- Timber groynes, rock groynes, seawall, rock revetment and cliff drainage	- Beach recycling between 2011-2018 moving 57,000m ³ from harbour entrance onto upper beach between Avon Beach and Highcliffe. - In 2021 beach recycling to Avon Beach, Friars Cliff and Highcliffe Beach, using material from the 4 easternmost groyne bays at Highcliffe. - Beach nourishment between 1985-1991 at Highcliffe of 73,000m ³ of material that has largely been retained.	BCP, Private
SMZ 4: Naish Cliff and Barton on Sea	- Barton on Sea: Rock revetment, rock groynes and cliff drainage - undefended at Naish Cliff	- No beach management in this location	NFDC
SMZ 5: Taddiford	- undefended	- No beach management in this location	NA
SMZ 6: Milford on Sea	- Seawall, timber groynes, rock groynes and rock revetment	- Small scale beach nourishment in 2004, 2006 and then annually since 2008. Total volume of approximately 45,000m ³ with an average of 2,500m ³ per nourishment.	NFDC

Measures to manage the consequences of coastal flooding and erosion risk

2.3.5 To manage the consequences of coastal flooding, the Local Authorities have a number of measures in place. Both BCP and NFDC have details on their website about how to prepare properties for flooding (i.e. setting up an emergency plan, insurance, emergency box etc.) and offer advice for during flood events such as how to stay safe, when, and how to travel etc. Both councils also provide details of the Environment Agency flood warning system through social and traditional media channels and recommend that residents sign up to the flood warning service. In the event of flooding, BCP / NFDC's emergency planning officer co-ordinates the dissemination of advice and liaises with relevant organisations to advise people on what to do during a flooding emergency.

2.3.6 To manage the consequences of coastal erosion, following an erosion event, BCP and NFDC undertake an immediate inspection of the damage and risks posed. A recommendation for remedial works is then put forward to the Local Authority for funding approval from limited maintenance budgets. However, often the costs associated with failing defences is high and there is no guarantee that there would be sufficient funding available to make a repair and applications to the Environment Agency for emergency works may be required.

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3 Problem definition and objectives

3.1 Outline of the problem

- 3.1.1 There is currently no existing approved FCERM Strategy in place that provides the framework for the long-term management of the coastline within Christchurch Bay and Harbour and to facilitate the delivery of the SMP2 policies. Currently defence maintenance and improvements are undertaken on a piecemeal basis by BCP and NFDC. Without a Strategy in place it is difficult for these authorities to access FCERM-Grant in Aid (GiA) funding or develop robust partnership funding strategies.
- 3.1.2 There are significant coastal flooding and erosion risks facing the Strategy frontage over the next 100 years which are projected to increase in severity due to climate change and sea level rise. Higher sea levels and increased storminess will reduce the performance and standard of protection provided by existing coastal defences.
- 3.1.3 Table 3-1 shows the return period of extreme water levels within Christchurch Harbour for the present day and indicates how this is anticipated to change in the future (return periods rounded to nearest 0.1m water level for illustration purposes). These water levels have been determined using the Coastal Design Sea Levels – Coastal Flood Boundary Dataset (Environment Agency, 2018), and have been adjusted with the UKCP18 RCP 8.5 70th percentile sea level rise projections.

Table 3-1: Tidal extreme water levels and return period in Christchurch Harbour.

Extreme water level (mODN)	Return period			
	2024	2044	2074	2124
1.5	1 in 2 (50% AEP)			
1.6				
1.7	1 in 10 (10% AEP)	1 in 2 (50% AEP)		
1.8	1 in 20 (5% AEP)	1 in 10 (10% AEP)		
1.9	1 in 50 (2% AEP)	1 in 20 (5% AEP)	1 in 2 (50% AEP)	
2.0	1 in 200 (0.5% AEP)	1 in 50 (2% AEP)		
2.1		1 in 200 (0.5% AEP)	1 in 10 (10% AEP)	
2.2			1 in 20 (5% AEP)	
2.3			1 in 50 (2% AEP)	
2.4			1 in 200 (0.5% AEP)	
2.5				
2.6				1 in 2 (50% AEP)
2.7				1 in 10 (10% AEP)
2.8				1 in 20 (5% AEP)
2.9				1 in 50 (2% AEP)
3.0				1 in 200 (0.5% AEP)

- 3.1.4 With respect to the flood risk, in the Strategy area there are estimated to be 120 properties currently at risk from coastal flooding from a 1 in 200 (0.5% AEP) return period event. Due to climate change and sea level rise, this number is projected to increase to 2,227 properties for the 1 in 200 (0.5% AEP) return period in 100 years' time. With respect to the erosion risk, there are estimated to be 1,365 properties at risk of coastal erosion over the next 100 years if nothing is done to manage the risk.
- 3.1.5 Many of the existing coastal defences in the Strategy area are approaching the end of their effective service life. For the full Strategy frontage, approximately 8% of the defences by defence length are in a poor condition, 32% in a fair condition, 23% in a good

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condition, 1% in a very good condition and 36% in an unknown condition (private / inaccessible). If no maintenance is undertaken, the defences in the Strategy area would be expected to fail within the next 20 years, with many much sooner than this. Defence failure would exacerbate the risks of flooding and erosion to properties, infrastructure and environmental features. This includes the risk of flooding and erosion of several historic landfill sites primarily with Christchurch Harbour, which poses a threat to the coastal environment through the release of potentially contaminated materials and/or leachates.

3.1.6 Given the risks and strategic considerations faced, without robust and holistic management and suitable investment, the flooding and erosion risk has the potential to cause significant and unacceptable detrimental impacts to a range of important receptors, including people and the developed, historic and natural environment. Flooding and erosion would create significant economic damages on a national and local basis.

3.2 Consequences of doing nothing

3.2.1 A sound representation and understanding of the baseline flood and erosion risk under the 'Do Nothing' scenario was established to inform the Strategy development. Table 3-2 presents a summary of the properties at risk from flooding and erosion under the 'Do Nothing' scenario. Figure 3-1 presents a map of the Strategy frontage showing the 1 in 200 year (0.5% AEP) flooding extent for the present day and in 2120 and the Do Nothing erosion zones for the short term (0-20 years), medium term (20-50 years) and long term (50-100 years.)

Flood risk

3.2.2 The present day and future flood risk was identified using numerical model outputs and GIS analysis. Results from two numerical models were used:

- For Christchurch Harbour the present day flood risk was established from the numerical modelling results of the Lower River Avon and Christchurch Harbour Study. This project is ongoing and the modelling results were provided to the project team by the Environment Agency who are leading on the modelling project. The model considers tidal input and fluvial inputs from the River Avon and River Stour.
- For the future flood risk within the harbour, a GIS based approach was used that compared extreme tidal water levels to land levels. A range of checks were undertaken to check the consistency of the GIS approach against the Surface Water Management Plan outputs and emerging model results from the Lower River Avon and Christchurch Harbour Study for future return periods. The approach was endorsed by the Environment Agency members of the project team and more details can be found in the Economic Appraisal Report (Appendix F).
- For Milford on Sea the preset day and future flood risk was established from the numerical modelling results from the Hurst Spit to Lymington FCERM Strategy. This project is ongoing and the modelling results were provided to the project team by the Environment Agency who are leading on the project.

3.2.3 Sea level rise will have a significant impact on the flood risk. Extreme water levels for future return periods were projected using the UKCP18 RCP 8.5 70th percentile sea level rise projections, as per Environment Agency guidance.

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3.2.4 Within Christchurch Harbour the present-day coastal flood risk is generally focused on the banks of the harbour and low-lying areas such as Mudeford Quay, Wick Meadows, Elkins Boatyard and Stanpit Marshes. Currently there are setback flood defences at the Quomps, Rossiters Quay and Wick which prevent ingress of flood water further inland in these locations. In the future, with projected sea level rise combined with the failure / outflanking of existing defences, the flood risk in Christchurch harbour will become more extensive and extend further inland into areas such as Mudeford, Stanpit, Willow Drive and Wick. These are areas with a high concentration of properties and infrastructure which leads to significant economic damages from flooding. It is projected that 2,131 properties will be at risk from coastal flooding at Christchurch Harbour from a 1 in 200 year (0.5% AEP) event in 2124. This would include flooding to a significant number of listed buildings and parts of scheduled monuments.

3.2.5 At Milford on Sea the present day flood risk is concentrated either side of Hurst Road that runs parallel to the sea defences. This flood risk originates from wave overtopping of the sea defences from the open coast direction. In the future, with projected sea level rise, the flood risk at Milford on Sea will become more extensive and extend inland into the Sea Road area. The flood risk in the future comes from a combination of wave overtopping along the open coast and still water level flooding from the Sturt Pond direction (behind Hurst Spit, to the east of Milford on Sea). It is projected that 78 properties will be at risk from coastal flooding at Milford on Sea from a 1 in 200 year (0.5% AEP) event in 2124.

Erosion risk

3.2.6 The erosion risk was identified using the No Active Intervention erosion zones produced in the SMP2. The properties at risk from erosion are primarily located in three areas; Christchurch Beaches and Cliffs (primarily Highcliffe), Barton on Sea and Milford on Sea (including at Hordle Cliff). These areas generally have coastal defences at the toe of the cliffs or shoreline but there are localised exceptions.

3.2.7 At Christchurch Beaches and Cliffs there are extensive toe defences at Highcliffe that consist of a rock revetment and rock groynes. These support a successful drainage scheme installed at Highcliffe in the 1980's which has proven to be effective in stabilising the cliffs in this location in recent years. To the west of Highcliffe there is a wide mixed beach which provides protection to the cliff toe. Under a Do Nothing scenario the existing defence system would fail in the short-medium term, likely leading to an increased movement of beach material and a restart in cliff erosive processes. In addition, the defence system at Highcliffe is currently at risk of outflanking in the future because the coastline to the east at Naish Cliff is undefended and is rapidly eroding. It is estimated that 313 properties are at risk of erosion over the next 100 years under the Do Nothing scenario.

3.2.8 Barton on Sea has a history of coastal erosion, landslides and cliff instability. There are extensive rock defences at the cliff toe along the central and eastern parts of Barton on Sea, but the western part of the frontage is undefended. Cliff drainage is currently in place in the east part of Barton on Sea but has failed along the central sections of the frontage. The existing defences do not stop erosion from occurring due to the complex geology and the cliffs continue to erode at a slow rate. To the west of Barton on Sea is Naish Cliff which is undefended and eroding rapidly. Under the Do Nothing scenario erosion would be expected to continue at a fast pace at Naish Cliff and accelerate at Barton on Sea when existing defences fail. It is estimated that 477 properties are at risk of erosion over the next 100 years under the Do Nothing scenario.

3.2.9 The west part of Milford on Sea comprises Hordle and Rook Cliffs. The elevation of the coastline gradually reduces moving to the east and the eastern part of Milford on Sea is low lying. There are extensive coastal defences at Milford on Sea but they are ageing and

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vulnerable to failure. The risk is increased by the trend of falling beach levels at this location, particularly at the eastern end of the frontage. A significant failure of the seawall occurred in 2020 which required emergency intervention to repair. If nothing is done to manage the risks over the next 100 years, existing defences will fail leading to erosion of 574 properties, key infrastructure such as Hurst Road (access point to Hurst Spit), numerous coastal car parks and listed buildings such as the White House.

3.2.10 The SMP2 erosion zones do not cover Mudeford Sandbank and the areas within Christchurch Harbour. However, there is still likely to be coastal change in these areas in the future under a Do Nothing scenario, as discussed in Section 3.3.

Economic damages

3.2.11 The Do Nothing economic damages from the flooding and erosion risk have been calculated for the Strategy frontage for the next 100 years. The damages have been calculated in accordance with the Multicoloured Manual (MCM) and FCERM-AG methodologies and include direct property related damages and indirect damages.

3.2.12 The damages calculated using the MCM and FCERM-AG methodologies (as shown in Table 3-2) represent damages to the national economy and are eligible to be included the Strategy option economic appraisal and future FCERM-GiA funding applications. It is estimated that the total FCERM damages for the Strategy frontage are over £186million in present value (PV) terms and £1,213million in undiscounted cash terms, with the damages concentrated in SMZ 2 (Christchurch Harbour), SMZ 3 (Christchurch Beaches and Cliffs), SMZ 4 (Naish Cliff and Barton on Sea) and SMZ 6 (Milford on Sea).

3.2.13 In addition to these national economic damages, in developing the Strategy the project team has also estimated wider damages to the local economy from the flooding and erosion risks, such as the Gross Value Added damages, potential damages to tourism, health and wellbeing and council revenue. These local economic damages far exceed the national damages over the duration of the appraisal period, but have not been considered when selecting the Strategy National Leading Options and will not be used in FCERM-GiA funding applications in the future. They are useful to inform local decision making and to provide a broader evidence base for FCERM and attracting non-GiA funding sources.

3.2.14 More information on the economic assessment and appraisal for the Strategy can be found in the Economics Appraisal Report (Appendix F).

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Table 3-2: Properties at risk from coastal flooding and erosion (1 in 200 year event, 0.5% AEP) and Do Nothing Damages over the next 100 years

SMZ	Zone Characteristics	Total properties at risk of coastal flooding (residential and non-residential)				Total properties at risk of coastal erosion (residential and non-residential)			Total Do Nothing Damages (PV, £k)
		2024	2044	2074	2124	2044	2074	2124	
1 – Mundeford Sandbank	Sandbank, exposed to wave energy. Mainly beach huts with a few businesses. Area popular for recreation and tourism and buried services buried beneath the Sandbank.	4	5	6	6	0	0	0	153
2 – Christchurch Harbour	Town of Christchurch located within sheltered harbour environment. Interaction of Rivers Avon and Stour with the harbour. High density of properties leads to significant flood risk. Risk of erosion to historic landfill sites. Environmental designations.	110	527	1,132	2,131	0	0	0	111,297
3 – Christchurch Beaches and Cliffs	Open coast frontage that is important for recreation and tourism. Mixed beach exposed to wave energy. Topography increases in elevation moving east.	1	2	3	12	9	41	313	15,935
4 – Naish Cliff and Barton on Sea	Open coast frontage characterised by high cliffs that are eroding. SSSI designation of cliffs due to geological importance. Naish Cliff undefended whereas extensive cliff toe defences and drainage (some of which has failed) at Barton on Sea.	0	0	0	0	10	120	477	28,364
5 – Taddiford	Undefended open coast frontage with very few properties along the cliff top. Actively eroding cliffs and mixed beach.	0	0	0	0	0	0	1	73
6 – Milford on Sea	Open cost frontage with extensive sea defences that are threatened by lowering beach levels. Properties at risk from flooding (wave overtopping and still water level) and erosion. Beach huts at base of Hordle Cliff.	5	18	38	78	6	81	574	30,415
Total		120	552	1,179	2,227	25	242	1,365	186,237

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3.3 Strategic issues

- 3.3.1 There are a number of strategic issues facing the frontage that span geographical areas and time periods and require a joined-up and cohesive FCERM Strategy to manage effectively. These include;
- the impact of future uncertainty due to climate change and funding availability;
 - beach sediment transport processes and the influence that this has on coastal erosion;
 - lowering beach levels at Milford on Sea;
 - the evolution of Mudeford Sandbank and its influence on Christchurch Harbour;
 - the erosion risk to historic landfill sites; and
 - the interaction of the Strategy with Hurst Spit.
- 3.3.2 The SMP2 explored some of these issues and set policy accordingly. However, the work undertaken to develop and appraise options in the Strategy has not been rigidly confined to the SMP policies and has revisited assumptions, in light of new evidence, to develop leading options and a range of adaptive pathways for future FCERM within the Strategy area.
- 3.3.3 The leading options in the Strategy do not align with the intent of the SMP policy in ODUs 2, 3 and 9. This could also be the case in ODUs 1, 4 and 11 if the Local Options are not delivered. Where differences between the Strategy leading options and the SMP policy occur, the changes are often in line with the findings of the SMP refresh.

Future uncertainty

- 3.3.4 There is uncertainty around the magnitude of future climate change and sea level rise and the availability of funding for FCERM projects in the future. Climate science is an ever evolving area of research and future climate scenarios are heavily influenced by human greenhouse gas emissions which will be shaped by future government policies and technological advances (both of which are highly uncertain and difficult to predict). The Strategy has applied the climate change projections recommended by the Environment Agency (UKCP18, RCP 8.5, 70th percentile) and has sensitivity tested the option appraisal to higher rates of sea level rise. However, there is still uncertainty and therefore it is imperative that the long term plan for FCERM in the Strategy area does not set a rigid intervention approach that cannot be changed in the future.
- 3.3.5 Likewise, there is uncertainty around future funding availability and funding rules from central Government. There is currently a partnership funding system in place to obtain central government funding (FCERM-GiA) but it is unlikely that this system will remain unchanged for the duration of the Strategy appraisal period (i.e. the next 100 years). Likewise, funding from non-GiA sources will be influenced by local policy, politics and development opportunities which is also uncertain.
- 3.3.6 With this uncertainty in mind, it is essential that a Strategy to manage the risks to people, property and the natural environment from flooding and erosion is flexible. Therefore, the Strategy has developed adaptive pathways that provide the required flexibility for FCERM decision making in the future to act and change course accordingly as the evidence base develops.

Beach sediment transport

- 3.3.7 The role of coastal processes and beach sediment transport within Christchurch Bay is a critical strategic issue because the beach volume is a key influence on rates of coastal erosion. The dominant longshore transport direction within the Bay is from west to east.

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Currently there are areas that are undefended and where longshore transport is unconstrained (i.e. Naish Cliffs, Becton to Hordle Cliff), and other areas where beach control structures such as groynes influence the rate of longshore sediment transport (i.e. Christchurch beaches, Highcliffe, Milford on Sea). Some parts of the Strategy frontage have sufficient beach material (i.e. Highcliffe) whereas other parts of the frontage do not have enough (i.e. Milford on Sea).

- 3.3.8 In developing the Strategy it has been important to fully consider the knock-on impact on longshore sediment transport from the proposed options. This has required strategic level thinking that is not always prevalent when FCERM interventions are developed on a scheme by scheme basis without a Strategy in place, including considering how the influence of the Strategy proposed options on longshore transport will also impact Hurst Spit to the east.

Lowering beach levels – Milford on Sea

- 3.3.9 Related to the above, there is a trend of lowering beach levels at Milford on Sea at the eastern end of the frontage. This trend is increasing the vulnerability of the existing defences in the location and is increasing the undermining risk and risk of defence failure.

- 3.3.10 In developing the Strategy the role that beach nourishment could have in managing the beach lowering at Milford on Sea has been considered, not just by directly placing material at this location but also more broadly in other strategic locations within the Bay. In some locations it may be feasible to overfill the beach with material, increasing the supply of sediment towards Milford on Sea over time. Overall a more cohesive approach to managing beach material in the bay is required and the Strategy has suggested leading options that will help facilitate this. After the Strategy it is recommended that a bay wide Beach Management Plan is produced that aligns with the Durlston to Hurst Sediment Resource Management Programme (which aims to better manage beach sediment within the Poole and Christchurch Bays sediment sub-cell).

Muddeford Sandbank

- 3.3.11 Without further FCERM intervention, Muddeford Sandbank would likely rollback over time in response to storm events that would move material from the seaward side / crest of the Sandbank to the lee side. If the rollback process is not managed, it would likely cause severe disruption to the Sandbank (which is an important tourism area), lead to loss of beach huts, expose and damage buried services and would increase uncertainty around the morphology of the area.

- 3.3.12 Currently the Sandbank provides shelter to Christchurch Harbour and any significant changes to the morphology of the Sandbank (such as rollback / flattening) could reduce this effect. As part of the Strategy development, sediment transport and wave modelling was undertaken to investigate the potential impacts of a breach of the Sandbank (a breach 90m wide). This modelling concluded that a breach of this size would likely increase wave heights in the harbour. However, on the north side of the harbour where the majority of properties are located, the increase in wave height would only be expected to be between 0.1-0.15m.

- 3.3.13 The future of the Sandbank will impact the FCERM within Christchurch Harbour and therefore it has been important for the Strategy to propose options accordingly, both for the Sandbank itself, and for adjacent areas. This has also been done considering the interaction with management approach in Poole Bay which aims to prevent erosion leading to a breach from Poole Bay into the harbour which would also have significant impact on FCERM in the harbour.

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Historic landfill

- 3.3.14 Christchurch Harbour is currently sheltered by Mudeford Sandbank and Hengistbury Head and therefore wave activity and erosion risk is more limited compared to the open coast. However, there is still some potential for erosion within the harbour in undefended areas or if existing defences fail.
- 3.3.15 A key strategic concern for the Strategy is the erosion risk to historic landfill sites of which there are several around the harbour, including at Stanpit, Wick, the Quomps and Mudeford Quay. Erosion could release potentially contaminated materials into the environment. The contamination status of the historic landfill sites is unknown so more work is needed after the Strategy to investigate this risk further. In the option development and appraisal the Strategy has taken a conservative stance and recommended defending historic landfill sites as part of the leading options and adaptive pathways.
- 3.3.16 There is a recognition that on a national basis protecting historic landfill sites does not typically attract sufficient FCERM-GiA and therefore additional sources of funding will need to be sought and investigated to facilitate the delivery of these works.

Hurst Spit

- 3.3.17 Hurst Spit is located at the eastern end of the Strategy frontage and forms a vital controlling feature for the morphological evolution of Christchurch Bay. In developing the Strategy the project team has collaborated with the Hurst Spit to Lymington FCERM Strategy team. It is understood that various options for managing Hurst Spit in the future are being considered by the Hurst Spit to Lymington Strategy, including controlled rollback.
- 3.3.18 The role of beach management within Christchurch Bay has an influence on the future of the spit, as FCERM actions in the bay will influence how much material the Spit will naturally receive. Many of the leading options for the Christchurch Bay and Harbour Strategy involve beach nourishment / management and depending on the level of nourishment and the extent of recycling activities, it would be expected to increase the feed of material to Hurst Spit over time, relative to this situation today. The leading options for the Strategy have been discussed with the Hurst Spit to Lymington team and more details of the interaction between the leading options and Hurst Spit are provided in section 6.7.
- 3.3.19 The potential coastal process impacts of the rollback of the spit are uncertain and potentially wide ranging across Christchurch Bay and also the Solent area. The existing coastal processes allow the formation of offshore banks (such as Shingles Bank and Dolphin Sands) and influence the sediment distribution patterns observed within the bay.
- 3.3.20 A working assumption from both projects is that the large rock revetment at the base of Hurst Spit (landward end) will be held in place over the duration of the Strategies. This will provide an anchor point for both the Spit and also for Milford on Sea and the options have been developed in this Strategy on this basis. However, if managed rollback of the spit is the leading option that is identified in the Hurst Spit to Lymington Strategy, it will be important to fully understand the coastal processes implications of the rollback and to manage the rollback accordingly so that it does not threaten the rock revetment transition point or have significant negative impacts on wider coastal processes within the area.

3.4 Key constraints

- 3.4.1 The key constraints for the development of the Strategy relate to environmental requirements such as the Habitats Regulations. The majority of the Strategy frontage is

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within or adjacent to environmentally sensitive receptors (see Section 2.2) and the development of the Strategy has considered how the options can limit or mitigate any impacts and enhance these receptors.

- 3.4.2 The Strategy has undertaken a range of environmental assessments including an SEA to support option development and appraisal, a Habitats Regulations Assessment to assess compliance of the leading options, a Marine Conservation Zone Assessment to determine the potential impacts of beach nourishment on the nearby designations, and a Water Framework Directive Assessment.
- 3.4.3 In some locations, particularly within Christchurch Harbour, the construction of new defences or improvements to existing defences may be technically challenging due to a lack of space and varied land ownership. An appropriate level of risk contingency and optimism bias has been incorporated into the option costs to account for these uncertainties. Site walkovers with the project team were also undertaken to assess the technical feasibility of the Strategy options.
- 3.4.4 Parts of the frontage, particularly around Christchurch Old Town have historic and listed buildings and monuments and therefore the design of new structures at scheme level should be in keeping with the historic and built environment and should incorporate mitigation measures as required.

3.5 Objectives

Objectives

- 3.5.1 The project objectives were defined at the outset in collaboration with the Project Board. The objectives of the Strategy have focussed the project on what is needed to address the identified problems and strategic issues. To ensure that the Strategy has delivered upon these objectives they were continually considered throughout the project development. The Strategy objectives are:
 - To build on the work of the Poole and Christchurch Bays Shoreline Management Plan (SMP2);
 - Acknowledge overlaps, dovetail, and support other adjacent / overlapping FCERM strategies, studies and projects that have been produced or are currently being developed;
 - To define, articulate and raise awareness of coastal flooding and erosion risks to people and the developed, historic and natural environments and the role of the Strategy in the management of these risks;
 - To identify the preferred technically, economically, and environmentally sustainable strategic options for managing those risks over a 100 year appraisal period, and define an implementation plan (taking into account climate change and predicted sea level rise);
 - To balance the needs of people and the environment;
 - To comply with environmental legislation and identify opportunities for environmental benefits, allowing where possible the natural evolution of the shoreline;

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- To identify opportunities for broader outcomes. Broader outcomes will be linked to partner initiatives such as regeneration and economic growth, tourism, recreation, and amenity;
- To integrate and align with the Local Plans covering the Strategy frontage (including the Bournemouth Local Plan, the Christchurch and East Dorset Local Plan and the New Forest Local Plan);
- To identify opportunities for potential contributions to future management and maintenance through developing partnerships with beneficiaries, key stakeholders, communities and supporting plans and programmes;
- To develop an action plan and forward programme of studies/projects needed to implement the strategy over the next 5, 10 and 20 years. This will set out adaptation pathways for the long-term strategic approach, including triggers and thresholds for key management decision points to guide future monitoring efforts; and
- To ensure the Strategy obtains Statutory and Key Stakeholder support, Adoption by the Local Authorities and Environment Agency LPRG assurance.

Critical success factors

3.5.2 To guide the option development and appraisal process for the Strategy, a set of critical success factors were also identified:

- Strategic fit and business needs – develop and identify leading options that are consistent with the ambitions of BCP and NFDC and also the Environment Agency’s National FCERM Strategy;
- Potential value for money – the whole life benefits of the leading options should exceed the whole life costs or provide good value for money when compared to alternative options and other FCERM interventions;
- Supplier capacity and capability – potential suppliers should have the capacity and capability of carrying out the leading options;
- Potential affordability – identify leading options that have a realistic possibility of being funded and implemented with support and/or contributions from partners; and
- Potential achievability – the leading options should be able to obtain necessary approvals and consents and it must be physically possible to construct and maintain the leading options over their intended life.

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4 Options for managing coastal flood and erosion risk

4.1 Framework for option appraisal

Strategic Options and FCERM Measures

- 4.1.1 For each area of the Strategy frontage, a series of 'strategic options' were developed and appraised. These outline the FCERM intent of the interventions over the next 100 years, such as doing nothing, maintaining the defences, sustaining the defences, improving the defences or undertaking managed realignment.
- 4.1.2 The strategic options are made up of a 'package' of FCERM measures. The measures refer to the local level defences that would be constructed or maintained (e.g. a seawall, setback floodwall, beach recycling etc.). Often it is necessary to combine a variety of these measures into a 'package' and therefore strategic options generally include a combination of FCERM measures that would be implemented over time to deliver the option.

Spatial and temporal Framework

- 4.1.3 The option development and appraisal for the Strategy has been undertaken across a spatial framework comprising six Strategy Management Zones (SMZs) and eighteen smaller Option Development Units (ODUs). ODU are small local areas of the frontage with consistent themes and risks. SMZs are larger areas of the Strategy frontage that comprise multiple ODUs with similar characteristics or strategic considerations. Figure 4-1 shows a map of the SMZs and ODU locations. *Note that after agreement with the Environment Agency Partnership Strategic Overview team, no appraisal was undertaken for ODU 8 as the risk in this location is fluvially dominated. It was agreed that it would be more appropriate for this area to be appraised during future work on the River Avon.*
- 4.1.4 Strategic options and packages of measures have been developed and appraised for each ODU. In addition, the appraisal has also considered how the options in each unit align with the options in adjacent areas to ensure that the plan is cohesive across the broader Strategy area. Using this spatial framework has allowed the Strategy options to be developed on an area by area basis, ensuring that local needs and opportunities are considered whilst also confirming that there are appropriate strategic links with adjacent areas of the frontage.
- 4.1.5 The appraisal period for the Strategy is the next 100 years, from 2024 to 2124. The flooding and erosion risks change over time and therefore to facilitate the option development and appraisal the appraisal period was broken down into three epochs:
- Epoch 1 (short term, 2024-2044);
 - Epoch 2 (medium term, 2044-2074); and
 - Epoch 3 (long term, 2074-2144).

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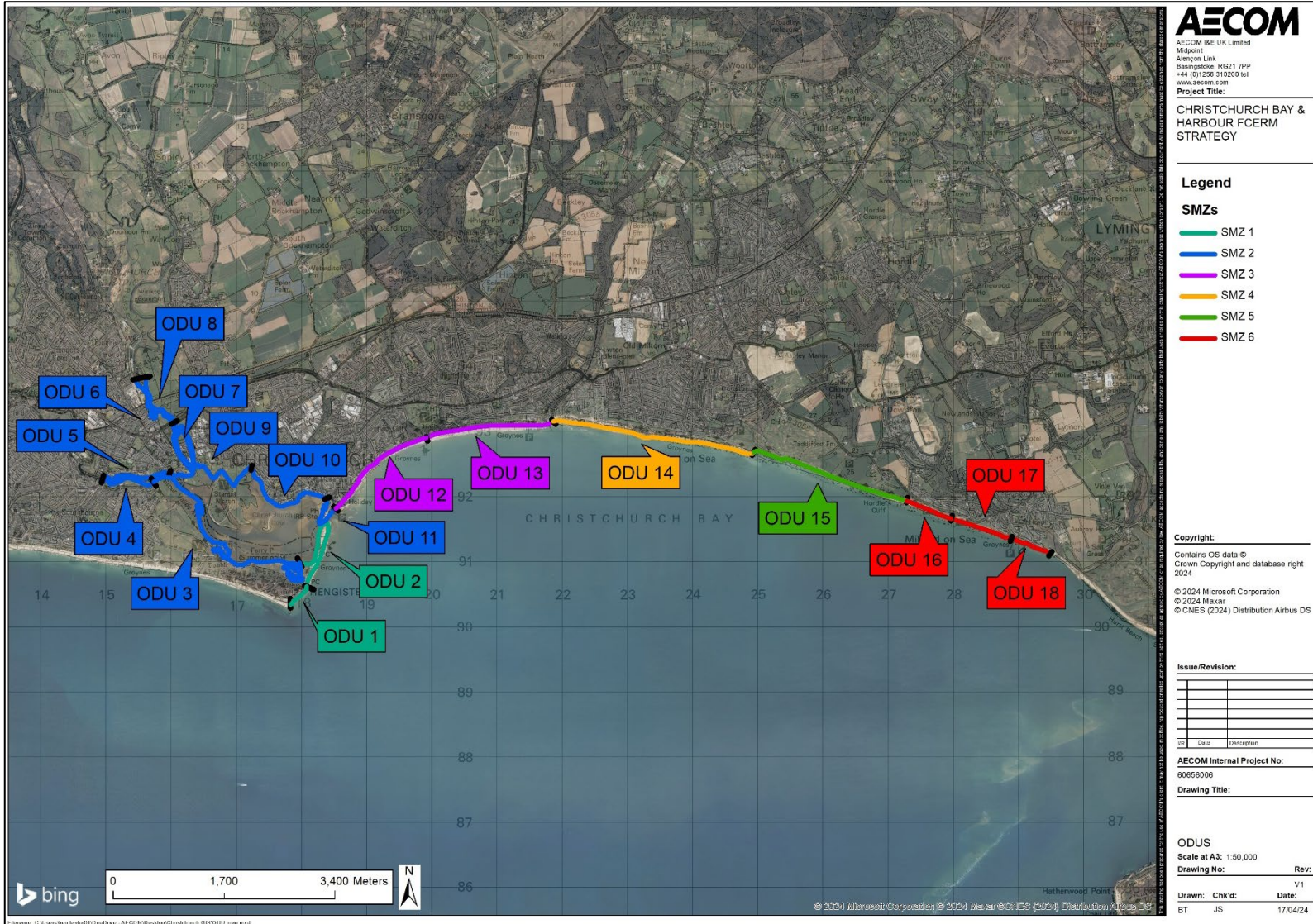


Figure 4-1: Map of ODU and SMZ boundaries

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Strategy Leading Options

4.1.6 Within each ODU up to three types of leading option have been identified, as follows:

- National Leading Option – the leading option identified by following FCERM-AG decision rules;
- Local Aspirational Option – an option that takes into account local opportunities, wants, and needs to deliver greater or wider benefits. The Local Aspirational Option is typically a higher cost than the National Leading Option.
- Backup Option – an option that is more deliverable from a funding perspective than either the National Leading Option or the Local Aspirational Option. Backup Options typically have lower present value costs and smaller capital funding requirements but deliver less benefits.

4.1.7 As a minimum, each ODU has a National Leading Option identified, but not every ODU has all three option types. In some ODUs only a National Option has been selected if it meets all the Strategy objectives, whereas in other ODUs all three types of option have been identified.

4.1.8 In ODUs where multiple leading option types have been identified, the Strategy has in-built flexibility to move between the options when it is being implemented over the next 100 years. The different routes that can be followed between implementing the options are known as 'adaptive pathways'. Following this approach increases the adaptive capacity of the Strategy, as outlined below.

Adaptive Capacity

4.1.9 Adaptive capacity is the ability to adjust to future change in order to take advantage of opportunities that arise and to be able to appropriately manage additional risks that are presented. The Strategy option appraisal has embedded adaptive capacity into the appraisal decision making framework and option selection process. This will help the FCERM teams deliver the Strategy over the next 100 years despite a range of future uncertainties.

4.1.10 There are numerous uncertainties relating to FCERM at the coastline. However, the key uncertainties in delivering the Strategy over the next 100 years are considered to be:

- Climate change - the rate and magnitude of climate change is highly uncertain over the next century, influencing the amount of sea level rise and changes to wave climate. The rate and magnitude of climate change will determine the flood and erosion risk along the Strategy frontage;
- Funding - the amount of funding that could be available from both public and private sources for FCERM related activities is also uncertain. A high level estimate of potential FCERM-GiA that could be available for the leading options has been undertaken as part of the option appraisal, but there is uncertainty in these calculations and funding rules could change;
- Project / Construction costs - have the potential to change significantly over short periods of time (as illustrated by the high rate of inflation between 2022-2023) and are influenced by global and national macro-economic factors beyond the control of the local FCERM teams;

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- Potentially contaminated land - there are a number of historic landfill sites located along the Strategy coastline. There is uncertainty as to whether these sites contain contaminated materials and site investigations are required to either confirm the presence of or rule out contamination risk;
- Land ownership / consenting - there are different land owners along the Strategy frontage. This presents uncertainties relating to maintenance responsibilities and support / consenting for options; and
- Future development – future development could occur in the Strategy area, potentially leading to additional sources of funding at certain locations or changes in stakeholder views of FCERM options.

4.1.11 FCERM has always faced the challenges of decision making in the face of multiple uncertainties, including in the climate, the economy and society. Traditionally these have been addressed by adopting a precautionary approach, acting as early as possible to manage potential risks but with typically high costs. For example, constructing a new coastal defence right away with a large freeboard allowance to account for potential increases in climate change that could occur.

4.1.12 A managed adaptive approach is more flexible and capable of addressing challenges and opportunities as they arise. Managed adaptive approaches typically provide greater resilience to negative changes in uncertainties (e.g. if more climate change occurred than expected) and enable opportunities to arise from positive future changes (e.g. changes to FCERM policy, improved scientific knowledge, more funding availability etc.). In addition, a managed adaptive approach helps to avoid potential abortive investment if future scenarios don't develop as anticipated.

4.1.13 To facilitate options that have a managed adaptive approach, the Strategy appraisal has:

- Developed and appraised options on an epoch basis – three time epochs have been used in the Strategy appraisal; the short term (2024-2044), the medium term (2044-2074) and the long term (2074-2124). Each option developed and appraised includes details of what interventions are planned in each epoch. If climate change occurs more quickly or slowly than currently anticipated, then interventions set out on each option can be brought forward or delayed accordingly. This ensures that options have in-built adaptive capacity to respond to changes in climate change as they occur;
- National, Local Aspirational and Backup Options – many of the ODUs have all three option types identified as leading options which provides the FCERM teams with flexibility to choose the most appropriate option as uncertainties resolve, or to take different 'adaptive pathways' between the options as required. For example, should risks change (e.g. if climate change occurs faster than anticipated) or additional funding become available, it is possible for option choices to change over time and to move between the leading options as required; and
- Uncertainty - sensitivity tests have been undertaken on key variables such as cost increase or sea level rise when identifying the leading options. This has ensured that the leading options are robust with multiple key uncertainties.

4.1.14 Whilst managed adaptive options have been fully considered in the appraisal, they have not always been selected as the leading options. In some situations, the leading options for an ODU may include a precautionary 'improve' option whereby defences would be raised to the full height required to provide a desired SoP in 100 years' time. In these

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situations the decision has generally been driven by cost effectiveness, often related to the type of defence being considered. In addition, typically where these precautionary options have been identified, they coincide with undertaking the defence upgrade scheme in the future (i.e. in epochs 2 or 3) when more details on uncertainty such as climate change will be known. When designing these improve options during concept / outline design it is recommended that the design includes foundations / capacity for the defences to be further raised in the future if sea levels rise faster than currently anticipated. This will ensure the precautionary options are robust / reliable / adaptable despite the future uncertainty in climate change projections.

4.2 Long list of strategic options

4.2.1 As a starting point for the option development and appraisal, a generic long list of strategic options was developed by the project team (BCP, NFDC, Environment Agency, AECOM) and obtained input from wider specialists within each organisation as required. These strategic options deliver a specific FCERM intent over time and included:

- Do Nothing – No further defence maintenance or construction;
- Do Minimum – Reactive small-scale maintenance to prolong the service life of existing defences over a short-term period and ensure health and safety compliance;
- Maintain – Undertake proactive maintenance / defence refurbishments / beach recycling to prolong the service life of existing defences over a long-term period;
- Sustain – Upgrade the existing defences or construct new defences to reduce flood and erosion risk and provide a standard of protection that keeps pace with sea level rise over time. This option is typically implemented by incrementally increasing the crest height or robustness of a defence over time (i.e. a managed adaptive approach);
- Improve – Upgrade the existing defences or construct new defences to reduce flood and erosion risk and provide a high standard of protection until the end of the appraisal period (i.e. a precautionary approach);
- Managed Realignment – Realign the coastline further inland or seawards, and/or actively manage the erosion rate of the coastline. This option may involve creating a more sustainable coastline position and/or making space for nature; and
- Adaptation / Resilience – Implement property level / community level resilience measures, create adaptation plans and identify Coastal Change Management Areas (CCMAs).

4.3 Potential FCERM measures

4.3.1 A wide range of different FCERM measures were considered in the option development and appraisal (e.g. seawall, floodwall, beach nourishment etc.). These FCERM measures are rarely implemented in isolation and have instead been combined into packages of measures that form the strategic options.

4.3.2 Given the diverse characteristics of the Strategy frontage, a broad range of FCERM measures was considered, focussed on managing coastal flood risk, coastal erosion risk or a combination of the two. Measures to improve the resilience against flooding and erosion were also considered (such as property level resilience).

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4.3.3 Table 4-1 presents the FCERM measures considered in the option development and appraisal.

Table 4-1: FCERM measures considered in the option development and appraisal

Local level measures		
Patch-repair maintenance	Gabions	Slope armour and reinforcement
Capital refurbishment	Embankment	Cliff slope stabilisation / drainage
Beach recycling	Flood storage areas	Land raising
Beach nourishment	Sheet piling	Land reclamation
Timber groynes	Deployable temporary defences	Offshore breakwater
Rock groynes	Deployable permanent defences	Offshore reef
Crest raising of defences	Tidal barrier	Saltmarsh restoration
Seawall	Armoured sand dunes	Property level resilience
Concrete / masonry revetment	Sand dune enhancements	Community level resilience
Rock revetment	Timber breastwork	Setback floodwall

4.4 FCERM measures rejected at preliminary stage

4.4.1 The next stage of the appraisal was to identify which of the FCERM measures would be appropriate for each ODU and which FCERM measures should be ruled out from further appraisal. To facilitate this a multicriteria assessment was undertaken to compare the relative merits of the FCERM measures in each ODU.

4.4.2 The multicriteria assessment considered the following categories; flood / erosion risk management, indicative cost, design life, natural environment, landscape and built environment, carbon, technical complexity, maintenance and operation requirements, and broader outcomes. A clear set of scoring criteria was developed so that each measure could be scored in an objective and consistent manner. The decision making process for each score was informed by the following:

- Supporting data and assessment – a review of a wide range of relevant data and completion of baseline studies provided the understanding of the frontage and the issues, constraints, and opportunities. This information provided the facts from which to screen-out non-viable measures.
- Visual site investigations – numerous site walkovers were undertaken to aid the team’s understanding and appreciation of each of the ODUs site conditions. Aspects such as space availability, position of defences relative to environmental designations and listed buildings were considered.
- Key stakeholder engagement – engagement with key stakeholders and members of the public prior to and during the long list phase of the project informed which of the defence measures had or lacked support.

4.4.3 A long list workshop with key stakeholders was facilitated by the project team. This involved a series of breakout discussions in which the scoring method and draft appraisal of FCERM measures was openly discussed / challenged and ratified. The outcome of this stage of the appraisal was a short list of FCERM measures for each ODU. These measures could then be used / combined into a package of measures over time to deliver the strategic options.

4.4.4 Table 4-2 below outlines which of the FCERM measures were taken forward for further appraisal. Measures not taken forward were rejected at this stage. A detailed breakdown and justification for rejecting the FCERM measures can be found in the Strategy Short List Report.

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4.4.5 In addition to the appraisal of FCERM measures in each ODU, broader Strategy wide measures, such as a tidal barrier and a 'shingle engine' were also appraised. These measures were ruled out from further consideration for various reasons:

- The tidal barrier was ruled out due to technical limitations, prohibitive cost, and environmental impacts.
- The 'shingle engine' was primarily ruled out on technical ground due to unsuitable tidal range and uncertainty around material distribution.

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Table 4-2: FCERM measures taken forward (highlighted in green)

FCERM level measures	ODUs																	
	1	2	3	4	5	6	7	9	10	11	12	13	14	15	16	17	18	
Patch-repair maintenance																		
Capital refurbishment																		
Beach recycling																		
Beach nourishment																		
Timber groynes																		
Rock groynes																		
Crest raising of defences																		
Seawall / Quay wall																		
Concrete / masonry revetment																		
Rock revetment																		
Gabions																		
Embankment																		
Setback floodwall																		
Sheet piling																		
Deployable temporary defences																		
Deployable permanent defences																		
Tidal barrier																		
Armoured sand dunes																		
Sand dune enhancements																		
Timber breastwork																		
Slope armour and reinforcement																		
Cliff slope stabilisation / drainage																		
Offshore breakwater																		
Offshore reef																		
Saltmarsh restoration																		
Flood storage areas																		
Property level resilience																		
Community level resilience																		

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4.5 Options short-listed for appraisal

4.5.1 The next stage of the process was to tailor the generic long list of strategic options outlined in Section 4.2 to the specific requirements of each location. This ensured that the strategic options being considered in each ODU were appropriate and covered the different risks, opportunities and constraints in each location:

- This process was based on the project team’s understanding of the study site, the distribution of FCERM economic damages, the receptors at risk of flooding and erosion, technical, social and environmental considerations.
- As part of this process the timing of interventions was considered, based on the onset of risk through time. In many ODUs the onset of risk to properties and other features is not until epochs 2 or 3 and therefore in this case the strategic options that look to upgrade defences, such as Sustain or Improve, may not recommend intervening until later on in the appraisal period.
- In some ODUs there are a range of strategic possibilities for defending different parts of the coastline. Therefore in some ODUs multiple strategic options with the same overarching FCERM intent were developed. For example, in ODU 14 there are multiple versions of the Managed Realignment Option to reflect differences in the length of the ODU 14 frontage that could be defended.

4.5.2 The short list of strategic options was developed during a collaborative project team workshop. This included representatives from BCP, NFDC, the Environment Agency and AECOM. Typically, each ODU had an agreed short list of 5-6 strategic options, although in some complex ODUs more options identified.

4.5.3 Once the short list of strategic options had been identified, a package of measures was then developed to implement the strategic options. This package of measures outlined how the strategic intent of the option would be delivered. The measures included in each package of measures was based on the results of the multicriteria appraisal of FCERM measures, outlined in Section 4.4.

4.5.4 A detailed description of the short list of strategic options can be found in the Short List Report and Leading Options Report (Appendix C). The following text provides a summary of the key features of the short list options and strategic themes at the SMZ level.

SMZ 1 (Mundeford Sandbank)

4.5.5 SMZ 1 includes ODUs 1 and 2 (Hengistbury Head and Mundeford Sandbank). There are relatively few properties located in this SMZ and the key risk in this location is from erosion / movement of the coastline and the impact that this could have on coastal morphology, buried services and the shelter provided to Christchurch Harbour by the headland and Sandbank.

4.5.6 The short list of strategic options in SMZ 1 are primarily focussed on how to manage the coastline evolution. The options include Do Nothing, Do Minimum, Maintain, Managed Realignment, Improve and Adaptation / Resilience options.

4.5.7 In ODU 1 the Improve option would result in the least amount of erosion to Hengistbury Head, followed by Managed Realignment. Do Minimum would be expected to lead to the most erosion (except for Do Nothing).

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- 4.5.8 In ODU 2, the Improve option would involve constructing new defences to prevent any rollback of the Sandbank over time. The Maintain option would involve refurbishing the existing defences and undertaking beach nourishment with the aim of reducing / controlling any rollback of the Sandbank and preventing major disruption. The Managed Realignment option would involve proactively moving and refurbishing defences to facilitate the rollback of the Sandbank.
- 4.5.9 A strategic option that considered relocation of assets off the Sandbank was also considered. However, this was ruled out because due to environmental designations there is insufficient space to move assets nearby.

SMZ 2 (Christchurch Harbour)

- 4.5.10 SMZ 2 includes ODUs 3 to 11. The main risk in this location is the flood risk to over 2,000 properties, key infrastructure, and historic assets in Christchurch Harbour over the next 100 years. This is the key driver behind significant Do Nothing economic damages in this area. In addition to this flood risk, there is also a risk of erosion to historic landfill sites.
- 4.5.11 The short list of strategic options in ODUs 3-11 are focussed on how to manage these risks and include Do Nothing, Do Minimum, Maintain, Sustain (various), Improve (various) and Adaptation / Resilience options.
- 4.5.12 The Maintain Options involve maintaining existing defences but accepting that the standard of protection against flood risk would fall over time due to sea level rise. The Sustain options involve constructing new defences or raising existing defences over time to keep pace with sea level rise and deliver a desired SoP against flood risk. The Improve options involve constructing new defences or raising existing defences to a desired SoP at the end of the appraisal period (i.e. a precautionary approach).
- 4.5.13 Multiple variations of the Sustain and Improve options have often been included in the appraisal so that different alignments for flood defences can be tested, as well as differences in how to manage frontline quay walls and erosion defences (i.e. including / excluding defences for historic landfill sites). Different timings of defence upgrades have also been considered to reflect the changing risk profile through time in different locations.

SMZ 3 (Christchurch Beaches and Cliffs)

- 4.5.14 SMZ 3 includes ODUs 12 and 13 (Avon Beach and Friars Cliff, and Highcliffe). The key risk in this location is from coastal erosion which, over the next 100 years, could lead to over 300 properties being lost under the Do Nothing scenario. There is also a risk of outflanking of the existing defences at the eastern end of ODU 13. Here the existing defences end abruptly and there is a transition into the undefended section of Naish Cliff that is actively eroding.
- 4.5.15 The short list of strategic options in ODU 12 and 13 are focussed on how to effectively manage the erosion risk in this location and to prevent outflanking of defences. The strategic options for these units include Do Nothing, Do Minimum, Maintain and Improve (various) options.
- 4.5.16 In ODU 13 consideration has also been made as to how to manage the interaction with Naish Cliff to the east and the short list for ODU 13 also included Managed Realignment options. These options would involve adjusting the defences in ODU 13 to promote a greater feed of beach material from west to east via longshore transport through this unit.

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4.5.17 In SMZ 3, where there are cliffs they are generally stable and the toe of the cliffs is defended by either a wide beach or hard defences. Continuing to provide robust toe defences is the focus of the Improve Options in these units.

SMZ 4 (Naish Cliff and Barton on Sea)

4.5.18 ODU 14 is the sole unit in SMZ 4. The key risk in this location is from coastal erosion and landslides which could lead to over 470 properties being lost under Do Nothing.

4.5.19 Due to the complex soft cliff geology in this location, it is not feasible to completely stop erosion from occurring. However, it is possible to slow the rate of erosion and delay the onset of economic damages and loss of properties. There is currently an area of amenity grassland at the top of the cliff that provides a buffer zone between the cliff edge and the properties / roadway at risk. The technical viability of cliff drainage solutions will rely on as much of this buffer zone being retained as possible.

4.5.20 The strategic options in ODU 14 are focussed on how to slow the rate of cliff erosion and manage the consequences of any further erosion. The short list of strategic options included Do Nothing, Do Minimum, Maintain, Managed Realignment (various) and Improve (various). In the appraisal the merits of defending different lengths of this frontage have been considered, as well as different timings of intervention.

4.5.21 The improve option focus on defending the whole frontage (including Naish Cliff). The Managed Realignment option focus on defending different lengths of the frontage with an aim of slowing the rate of erosion in the defended locations.

4.5.22 Coastal adaptation will be crucial for this area moving forward as there will be a loss of properties either during the Strategy appraisal period or afterwards.

SMZ 5 (Taddiford)

4.5.23 ODU 15 (Barton on Sea to Hordle Cliff) is the sole unit in SMZ 5. The key risk in this location is from coastal erosion. However, there are no assets or key features in this location and there is no justification for significant FCERM interventions. The short list options have been identified accordingly as Do Nothing, Do Minimum and Managed Realignment.

SMZ 6 (Milford on Sea)

4.5.24 SMZ 6 includes ODUs 16 to 18 and the main risk for most of this frontage is from coastal erosion. Under the Do Nothing scenario, over the next 100 years approximately 570 properties are expected to be at risk from erosion.

4.5.25 There is a trend of lowering beach levels in this location which is increasing the vulnerability of defences to undermining and failure. In ODU 18, in addition to the erosion risk there is also a risk from wave overtopping from the open coast and from tidal still water level flooding from the Sturt Pond direction.

4.5.26 The Strategic options in in ODU 16 and 18 consider how to manage the position of the coastline and/or manage the beach levels more effectively to reduce erosion risk. The options also consider how to improve the standard of protection against flooding in the future from both wave overtopping and still water level flooding. The short list of strategic options includes Do Nothing, Do Minimum, Maintain and variations of Managed Realignment and Improve options. Different timings of intervention have been considered.

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5 Options appraisal and comparison

5.1 Technical issues

- 5.1.1 The appraisal of the short list options considered a range of technical issues and opportunities such as construction and buildability risks, maintenance requirements, adaptability and impacts on wider coastal processes.
- 5.1.2 The detailed flood and erosion risk mapping for the Do Nothing baseline helped develop the understanding of the progression of risk at each ODU. This enabled the identification of ‘triggers’ for when FCERM interventions are required and was important for determining the required phasing of future works across the frontage.
- 5.1.3 The appraisal of the FCERM measures in each ODU provided the mechanism to account for technical aspects at the local scale such as buildability, constraints relating to existing defences and space availability. This approach has ensured that local level details within each ODU have been fully considered, and in doing so means that the strategic options put forward can be carried out, are buildable and are realistic to implement.
- 5.1.4 The key technical considerations for each SMZ are provided in Table 5-1. For more detailed discussion of the technical assessment see the Leading Options Report (Appendix C).

Table 5-1: Key technical considerations for the appraisal

SMZ	Key technical considerations
1	<ul style="list-style-type: none"> The leading options need to form a cohesive approach for the Hengistbury Head and sandbank. There is a risk of a disconnect occurring in the shoreline position if either the headland or sandbank are allowed to erode / rollback faster than the other. Hengistbury Head Long Groyne is currently in the process of being replaced which will anchor the west side of the headland for the next 100 years. If the headland is left to erode in an uncontrolled manner on the east side, there is a risk of outflanking of the groyne, potentially compromising FCERM in Poole Bay. Options that aim to control / reduce future movement of the headland in ODU 1 would be preferable from this perspective (i.e. Managed Realignment / Improve). There are buried services beneath the sandbank in ODU 2. Significant movement of the sandbank could lead to exposure / damage to these services. Options that aim to control / minimise future movement of the Sandbank would be preferable from this perspective (i.e. Maintain / Improve). Uncertainty in future morphology of the area if the headland and/or sandbank rollback significantly. Options that control / minimise future movement would be provide more certainty and provide confidence to FCERM within Christchurch Harbour (i.e. Managed Realignment / Improve in ODU 1 and Maintain / Improve in ODU 2).
2	<ul style="list-style-type: none"> Mudeford Quay (ODU 11) is adjacent to the entrance of the harbour (‘The Run’) and has a controlling influence on the morphology of the harbour. Similar to the Mudeford Sandbank, there is uncertainty as to the morphology changes that would occur if Mudeford Quay defences were to fail. Options to maintain or improve the defences here are therefore preferable from a technical perspective (i.e. Maintain / Sustain / Improve / Adaptation options in ODU 11). Generally there is sufficient space to implement the FCERM measures outlined in the short list options. However, in some locations, such as ODU 7, there could be some space constraints. Tri probability flood risk with the River’s Avon and Stour considered. Strategy has used latest flood modelling from the Environment Agency to inform economic and option appraisal.
3	<ul style="list-style-type: none"> Options that manage the outflanking risk in ODU 13 (Highcliffe) from Naish Cliff to the east are favourable from a technical perspective (i.e. Managed Realignment / Improve in ODU 13). Promoting the movement of beach material through this area to the east by modifying the defences at Highcliffe has been considered (Managed Realignment options in ODU 13). However, it is challenging to do this sustainably without compromising the effectiveness of the existing defences at Highcliffe. Options that improve the availability of beach material in areas to the east through beach management interventions are therefore preferable (Improve options in ODU 13).

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SMZ	Key technical considerations
4	<ul style="list-style-type: none"> Combination of drainage and cliff toe defences required for effective control on erosion. Erosion rate can be reduced but not stopped entirely due to complex cliff geology. Cliff drainage required to reduce the rate of erosion. The technical feasibility of drainage solutions improves when a greater amount of the existing amenity space at the top of the cliff can be retained (more space improves the buildability, design and efficiency of the scheme. With less space there is a risk that the cost of installing drainage could be higher or even impractical to install.). From a technical perspective, an earlier intervention that reduces the amount of amenity space lost is preferable (variations of the Managed Realignment option with earlier interventions are included in the short list for ODU 14). Uncertainty around the effectiveness of new defences at Marine Drive West due to slump zone from Naish Cliff.
5	<ul style="list-style-type: none"> Actively eroding cliff with little justification for FCERM intervention.
6	<ul style="list-style-type: none"> Trend of lowering beach levels that is increasing the vulnerability of the defences. Options that manage the beach levels with a more effective long term approach are preferable, such as improved beach control structures and beach nourishment activities. Complex flood risk from both open coast (wave overtopping) and from Sturt Pond (still water level). Options that promote movement of additional beach material onto Hurst Spit to the east are preferable for the management of the Spit (such as options that include beach nourishment that would increase the sediment supply). This would need to be integrated into the preferred option for Hurst Spit once it is established through the Hurst to Lymington Strategy

5.2 Environmental assessment

5.2.1 There are environmentally significant sites of international, national and local importance within or adjacent to the Strategy area and therefore environmental considerations formed an integral part of the option appraisal process. The key designations are outlined in Section 2.2 of this document.

5.2.2 A range of environmental assessments were completed to support the option appraisal. The key environmental considerations for each SMZ are provided in Table 5-2. For more detailed discussion refer to the various environmental reports for the Strategy (Appendices K to N).

5.2.3 Historic England and Natural England have reviewed the relevant environmental assessments (Historic England reviewed the SEA, Natural England reviewed the SEA, HRA and MCZ assessment) and have provided letters of support for the Strategy (see Appendix O).

Strategic Environmental Assessment

5.2.4 During the baseline stage of the project an Environmental Baseline Report and SEA scoping report were developed. These documents were sent to Natural England, Historic England and the Environment Agency for consultation.

5.2.5 A full SEA report was then developed in parallel with the selection of leading options. This assessment provided the evidence base to assess the environmental impacts of the short list options which informed the selection of the leading option. The SEA also ensured that environmental enhancement opportunities were captured and incorporated into the leading options.

Habitats Regulations Assessment

5.2.6 Two stages of the HRA were undertaken. Initially a screening report was developed to determine whether the leading options that had been identified could lead to likely significant effects required by the Regulation 63 of the Conservation of Habitats and Species Regulations 2017.

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5.2.7 The screening report concluded that in some locations the leading options could not be screened out from resulting in a likely significant effect and further assessment was required. Following this conclusion, an Appropriate Assessment was carried out to determine if the leading options would have an adverse effect on the qualifying features of the SAC, SPA and Ramsar sites that were screened in.

Marine Conservation Zone Assessment

5.2.8 Two stages of the MCZ Assessment were undertaken. Initially a screening assessment was undertaken to determine whether the leading options that had been identified could impact nearby MCZ sites. This assessment screened in the Needles MCZ and Southbourne Rough MCZ for a Stage 1 Assessment due to a potential for a temporary increase in suspended sediment concentrations and sediment deposition from beach nourishment activities.

5.2.9 The Stage 1 Assessment concluded that the leading options would have no significant risk to the conservation objectives of the Needles MCZ and Southbourne Rough MCZ, and no further assessment is required.

Water Framework Directive Assessment

5.2.10 A WFD Assessment was undertaken to assess the implications of the leading options on the WFD regulations. This concluded that there are potential impacts on waterbodies in the Strategy area, however, they are anticipated to be minimal for the most part. Where potential impacts have been identified, the WFD suggested mitigation to negate the impacts.

5.2.11 The WFD assessment was consulted upon with the Environment Agency FBG team who agreed with the conclusions of the assessment.

Carbon Assessment

5.2.12 Carbon and sustainability has been a consideration for the Strategy development. Carbon was included as key criteria when developing the packages of FCERM measures for the short list strategic options. In addition, a carbon assessment has been undertaken on the leading options to estimate the total carbon footprint and equivalent monetary value.

Table 5-2: Key environmental considerations for the appraisal

SMZ	Key environmental considerations
1	<ul style="list-style-type: none"> Hengistbury Head is highly designated and includes a SSSI, LNR, SAC and SPA. The area is also important for the historic environment and forms part of Hengistbury Head scheduled monument. Options that control / reduce the amount of erosion to these designations in ODU 1 are favourable from an environmental perspective (i.e. Managed Realignment / Improve). As part of the option appraisal, relocation of the beach huts and tourism assets from the Sandbank to Hengistbury Head was considered as a way of mitigating the impacts of potential rollback of the Sandbank on the community. However, this was ruled out because Hengistbury Head is highly designated and there is not sufficient space to relocate to this location within negatively impacting the environment. Opportunities for sand dune enhancement on the Sandbank.

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SMZ	Key environmental considerations
2	<ul style="list-style-type: none"> Erosion of historic landfill sites around the harbour could have negative implications on the environment. This is picked up in the WFD assessment and options that seek to defend the historic landfill sites are preferable from an environmental perspective. There is existing intertidal and saltmarsh habitat within the harbour that could be impacted by coastal squeeze in the future if existing defence lines are held in place by the Strategy. The saltmarsh habitat is not a qualifying feature of the SAC / SPA designations so this is not an issue from the perspective of HRA compliance. However, the WFD recommends that coastal squeeze impacts on saltmarsh are quantified at scheme level to identify the requirement for mitigation (with assistance from Regional Habitat Creation programme as required). There are many opportunities for saltmarsh enhancement / creation around the harbour and the short list options have included these where possible. Cultural heritage assets within the harbour at risk of flooding in the future. Options that defend these assets are preferable, although this is not always possible.
3	<ul style="list-style-type: none"> Options that defend these areas from erosion are preferable from an environmental perspective (Improve options in ODU 12 and ODU 13). The SEA identified opportunities for Biodiversity Net Gain (BNG) in this zone which should be explored during scheme development and appraisal.
4	<ul style="list-style-type: none"> Cliffs designated as a SSSI due to geological importance (Earth Heritage). The SSSI designation favours ongoing erosion of the cliff. Options that allow some erosion to continue to occur are therefore preferable from an environmental perspective (Maintain and Managed Realignment Options in ODU 14).
5	<ul style="list-style-type: none"> Cliffs designated as a SSSI due to geological importance (Earth Heritage). The SSSI designation favours ongoing erosion of the cliff. Options that allow some erosion to continue to occur are therefore preferable from an environmental perspective.
6	<ul style="list-style-type: none"> Options that defend these areas from erosion are preferable from an environmental perspective. However, proximity to Solent and Southampton Water SPA meant that project level HRA will be required at scheme stage. The SEA identified opportunities for BNG in this zone which should be explored during scheme development and appraisal.

5.3 Social and community impacts

5.3.1 It has been important to understand the concerns and aspirations of the local communities to ensure that the Strategy recommends acceptable options which are supported by current and future generations.

5.3.2 A comprehensive and targeted stakeholder and public engagement process has been carried out during the development of the Strategy. Engagement was carefully planned through the development of a Stakeholder Engagement Plan at the project outset and six rounds of engagement with the public / key stakeholders were planned (five of which have already been undertaken). Each round of engagement has also involved briefings with councillor representatives for the local community.

5.3.3 The stakeholder engagement was led and facilitated by stakeholder engagement specialists from BCP. Each round of engagement was targeted at key points in the project development and included:

- Engagement round 1: raising awareness of the Strategy and seeking data to inform the Strategy baseline;
- Engagement round 2: presentation of Strategy baseline findings and to seek further information that may alter the baseline;
- Engagement round 3: options identification workshops to identify and discuss all possible long list options with key stakeholders and confirm the appraisal process criteria;

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- Engagement round 4: presentation of the short list options to the public to seek feedback before more detailed appraisal;
- Engagement round 5: formal three month consultation period in which the draft leading options and Strategy were presented to the public to seek feedback; and
- Engagement round 6 (yet to occur): informing the public and stakeholders of the completed Strategy and how their feedback has helped shape the project.

5.3.4 The feedback from each round of engagement was collected by a questionnaire and online voting (during webinars). The results were tabulated and the key themes summarised in an engagement round summary report. This provided the project team with a detailed understanding of the key opportunities and concerns raised by stakeholders and the public which fed into the option appraisal process at each stage.

5.3.5 The feedback in particular has enabled the project team to identify which of the short list options best meet the stakeholder and public aspirations and has guided the selection of the Local Aspirational Options in many locations.

5.3.6 The key social issues and considerations are summarised in Table 5-3.

5.3.7 Results from the latest round of engagement (round 5 – public consultation) show strong support for the Strategy leading options. This is based on the questionnaire feedback responses, of which 86 were received. A breakdown of the results are shown in Figure 5-1 and for the vast majority of ODUs the percentage of respondents ‘strongly agreeing’ or ‘agreeing’ with the leading options typically outweighs those ‘disagreeing’ or ‘strongly disagreeing’.

Table 5-3: Key social considerations for the appraisal

SMZ	Key social considerations
1	<ul style="list-style-type: none"> • Tourism and recreation is a key feature of the sandbank to the local community and options that help to sustain this are favourable (i.e. Maintain, Managed Realignment, Improve in ODU 1). • Options that control / minimise rollback of the sandbank are preferable for minimising disruption to the beach huts and tourism businesses on the sandbank (i.e. Maintain / Improve in ODU 1). • Stakeholder and public feedback favoured options that included beach management, sand dune enhancements and rock defences, in keeping with the existing defences in this location.
2	<ul style="list-style-type: none"> • Christchurch harbour has a high concentration of businesses and visitor attractions and therefore the impact of flooding is more widespread than direct property damages. • Options that provide flood defences to properties and key assets at risk within the harbour are favourable from a social perspective (i.e. Sustain / Improve options). • Stakeholder and public feedback favoured options that included maintenance and new / upgraded raised defences.
3	<ul style="list-style-type: none"> • Area is a key visitor location and important for tourism within the bay. • Opportunities for public realm enhancements would be favoured from a social perspective. • Stakeholder and public feedback favoured options that included maintenance, groynes and beach management in keeping with the existing defences in this location.
4	<ul style="list-style-type: none"> • Erosion and potential loss of property in the future will impact the community and therefore measures to help mitigate the consequences of erosion will be needed, such as adaptation plans. • Stakeholder and public feedback favoured options that included cliff slope drainage, maintenance, rock defences and beach nourishment. Cliff slope drainage was considered to be the most important measure for this location.
5	<ul style="list-style-type: none"> • Coastal footpath along the top of the cliff is an important feature to the community. Adaptation measures such as moving the footpath and ensuring health and safety compliance with an eroding cliff have been considered.

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SMZ	Key social considerations
6	<ul style="list-style-type: none"> Beach is one of the few beaches within NFDC with disabled access. There are large number of beach huts and extensive car parking in this location that make this area important for recreation / tourism. Options that minimise disruption to these features are preferable (i.e. Improve options in ODU 18). Hurst Road landward of existing defences provides access to Hurst Spit and there is limited space to relocate. Options that hold the existing defence line are preferable to avoid disruption / loss of this road (i.e. Improve options in ODU 18). Stakeholder and public feedback favoured options that included maintenance, rock defences, groynes, seawalls and beach nourishment FCERM measures.

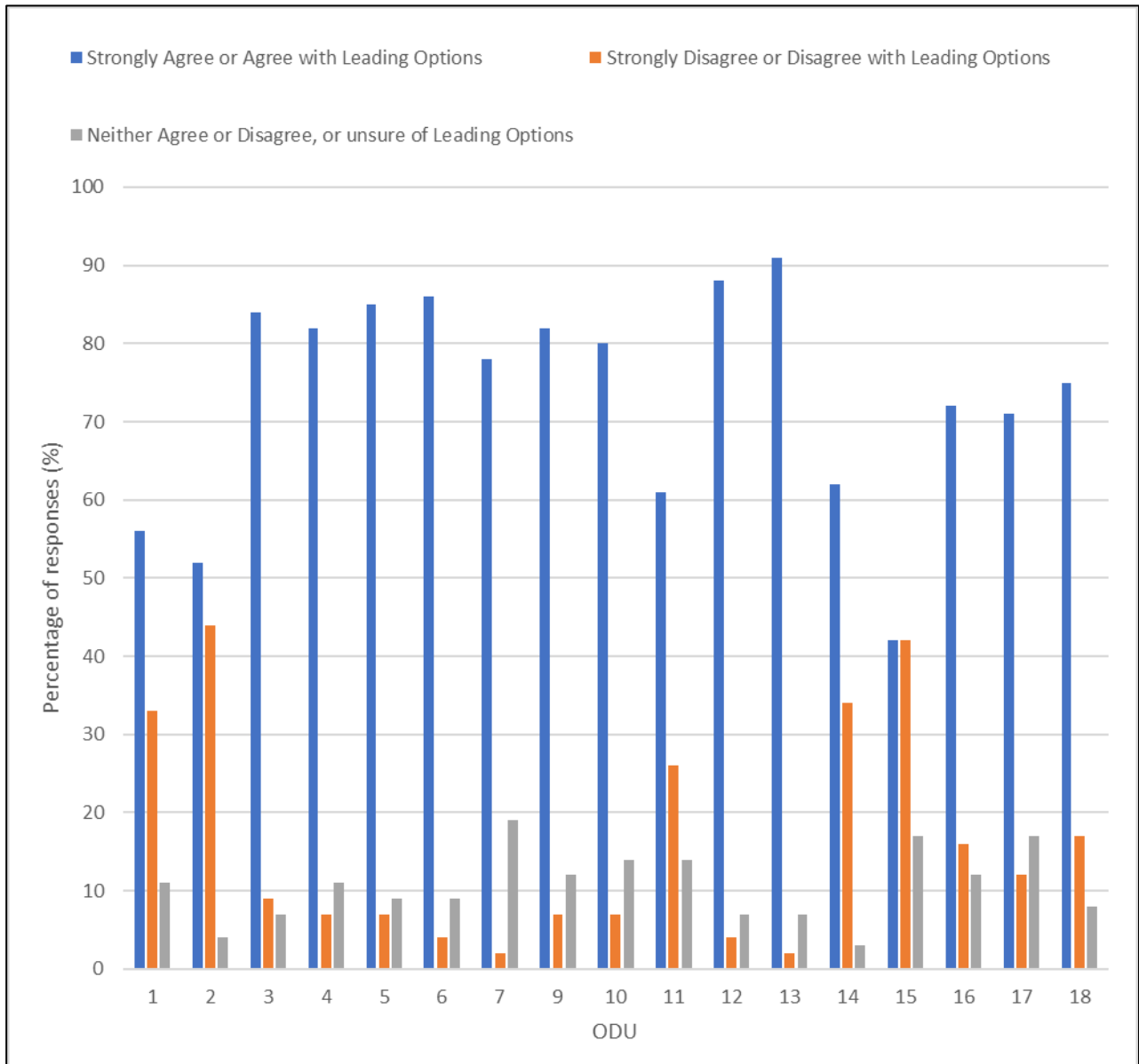


Figure 5-1: Summary of engagement round 5 survey feedback

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5.4 Option costs

5.4.1 Whole life costs (cash and present value) have been estimated for each of the short list options. This was done by estimating the costs of the packages of measures that comprise each option, and applying the required discount rate to costs that are planned to occur in the future. The whole life costs included capital construction costs (new defences and capital refurbishments) and maintenance costs (small scale patch repairs).

5.4.2 The whole life present value costs for each of the short list options are shown in Section 6. Full details of the costing assumptions can be found in the Economic Appraisal Report (Appendix F).

Capital Construction Costs

5.4.3 The cost of capital construction works were estimated using a variety of sources such as engineering price books (SPONS, 2024), Environment Agency Cost Guidance (2015) and contractor cost estimates for similar works elsewhere. The costs are presented with a base date of September 2023 developed using the latest costing and inflation data available at the time of writing this document¹.

5.4.4 Subject to the initial timing and type of FCERM measures in an option, repeat capital interventions were assumed to occur at future points in time when the structures would be expected to come towards the end of their service life.

5.4.5 Many of the short list options included beach nourishment and a cost of £33 per m³ was applied. This is a standard commercial rate, however, there is potential for this cost to vary depending on the source of material. There is potential for lower costs per m³ if a local source of material could be used which is something that is being actively explored by BCP and NFDC as part of the Durlston to Hurst Sediment Resource Programme. Sensitivity tests were undertaken on the beach nourishment cost to determine the impact on option selection.

Maintenance Costs

5.4.6 Maintenance costs were also included in the whole life costs and were estimated using Environment Agency cost guidance (2015), adjusted for inflation. Maintenance costs were applied annually.

Discounting

5.4.7 Standard discount rates have been applied to convert all costs to 'present value' (PV). Following the recommendations of FCERM-AG, the following variable discount rates have been used within the economic appraisal; 3.5% for years 0 to 30, 3% for years 31 to 75 and 2.5% for years 76 to 99.

Preliminaries, Appraisal, Optimism bias and Risk

5.4.8 The costs were uplifted by 45% to account for the cost of preliminaries and appraisal (35% preliminaries and 10% appraisal). In line with the HM Treasury guidance an optimism bias of 60% was applied to costs for each option to account for unknown risks and uncertainties. In addition to the optimism bias, a further 30% uplift was applied to take into account known risk factors associated with the Strategy frontage, such as the

¹ The September 2023 Construction Price Index from the Office for National Statistics was the latest available inflation data when costs were updated in February 2024 prior to submission of the Strategy to the BCP Council and NFDC.

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requirement for tidal working, the potential need for temporary works and the presence of buried services.

5.5 Options benefits (Damages avoided)

5.5.1 The short list strategic options aim to reduce the coastal flooding and erosion risk compared to the baseline Do Nothing scenario. This reduction in risk has been quantified in economic terms to generate the option benefits.

5.5.2 The first stage in calculating the option benefits was to calculate the flood and erosion residual damages associated with the options. Residual damages are the damages that would still be expected to occur with the options in place.

5.5.3 Residual damages associated with flood risk were calculated for:

- Damages to properties outside of the option benefit area;
- Damages from flooding from above design return period events greater than the intended SoP of the defences; and
- Damages for the time period before FCERM measures are implemented in the options.

5.5.4 Residual damages associated with erosion risk were calculated for:

- Damages to properties outside of the benefit area;
- Damages due to the intent of the option (i.e. some options aimed to just reduce the rate of further erosion but not prevent it from happening, thus delaying the onset of damages);
- Damages for the time period before any FCERM measures are implemented in the options; and
- Damages associated with the residual risk of erosion occurring after defences were constructed.

5.5.5 Once the residual damages for each short list option had been established, these damages were subtracted from the baseline Do Nothing damages to determine the option benefits. The whole life present value benefits for each of the short list options are shown in Section 6. A full description of the option benefit calculations and assumptions is provided in the Economics Appraisal Report (Appendix F).

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6 Selection and details of the leading options

- 6.1.1 As outlined in Section 4.1, up to three types of leading option have been identified in each ODU (National Option, Local Aspirational Option, Backup Option). The process for identifying these options is outlined below.
- 6.1.2 In ODUs where multiple types of option have been identified, the preference for implementing the option is as follows; 1) Local Aspirational Option 2) National Option 3) Backup Option.
- 6.1.3 The Strategy has been developed to allow for adaptive pathways between the different types of leading option and more details can be found in Section 7. In ODUs where Local Aspirational Options have been identified, this option be assumed to be the starting point / preference of the Strategy implementation.

National Option selection

- 6.1.4 Initially, the National Option was identified first in each ODU using the process outlined in FCERM-AG (Environment Agency, 2020). The key steps are discussed below.
- 6.1.5 For each of the ODUs, Cost Benefit Analysis (CBA) has been used to determine the National Leading Option. Through discussions with the Environment Agency it was determined that cost Effectiveness Analysis (CEA) was not appropriate.
- 6.1.6 As per FCERM-AG, it is typical to use CBA to appraise options at the strategic level where multiple FCERM problems across a large, interconnected area are being considered. CBA balances the range of costs and benefits allowing the appraiser to identify the nationally leading option. There are two different approaches that can be used for CBA, depending on the risks at the location being considered.
- 6.1.7 For options that are primarily focussed on creating a reduction in the flood risk, the process involves:
1. Establish the whole life costs and benefits of the options: Remove any options with an average benefit cost ratio (ABCR) <1 from the remainder of the appraisal. Take forward the options with an ABCR >1 .
 2. Organise the options and select the leading economic option: Organise the options with an ABCR >1 into a list based on reducing Annual Exceedance Probability of flooding (AEP) – improving Standard of Protection (SoP). The AEP for the onset of flooding will vary depending on where it is in a floodplain. The AEP can either be defined by the event probability that the economic impacts start (typically used in inland flood options and sheltered coastal areas) or the event probability that exceeds allowable overtopping rates (typically applied to coastal frontages with significant wave action).
- 6.1.8 Once organised, the incremental benefit cost ratio (IBCR) between options is then used to select the SoP that provides best value for money. The selected option (and SoP) is classified as the provisional economic leading option. The IBCR is calculated as the difference in option benefits between two options divided by the difference in option costs between the options.

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3. Test for uncertainty: Using results from a sensitivity analysis, consider whether the choice of the leading economic option needs to change to account for the uncertainties. If the provisional leading economic option stays the same in the sensitivity tests, do not change the option choice. However, if the sensitivity tests are showing that the choice of the provisional leading economic option changes under the test, consider a range of next steps, including whether to change choice of the leading option or to adapt the option to minimise the impact of uncertainties.

4. Determine National Leading Option: The leading economic option at the end of step 3 is identified as the National Leading Option.

6.1.9 For options that cannot be ordered by AEP, step 2 uses Net Present Value (NPV) to organise the options rather than reducing probability of flooding. Examples of options that cannot be ordered by AEP within the Strategy are coastal erosion focussed options (where a flood risk SoP is not provided) or strategic based options that deal with different areas within an ODU or other risk factors such as defending historic landfill sites. For this approach, steps 1, 3 and 4 remain the same for options that are reducing the erosion risk, but step 2 involves:

2. Organise the options and select the leading economic option: Organise the options with an ABCR >1 into a list based on increasing NPV. The leading economic option is the option with the highest NPV.

6.1.10 For the Strategy appraisal, when the options under consideration were solely focussed on managing flood risk, two different SoPs were considered in step 2; a 1 in 75 year standard and a 1 in 200 year standard. These standards were used as they represent the boundaries of the IBCR thresholds in the FCERM-AG and a recommendation for the SoP can therefore be made in the Strategy. In order to select the 1 in 200 year standard as the leading economic option, the IBCR needs to be greater than 3 relative to the 1 in 75 year standard.

Local Aspirational Option selection

6.1.11 In some ODUs the National Leading Option may not be preferable for local decision makers or communities, and there may be compelling local reasons to choose an alternative option from the short list.

6.1.12 FCERM-AG outlines how a local choice option can be selected as the overarching leading option to replace the National Leading Option if the additional expenditure for the local option is fully funded. Given that the Strategy represents the initial part of the overall appraisal process and funding for subsequent projects has yet to be secured, the local choice option has been termed the 'Local Aspirational Leading Option'. This reflects the intent of the project team to secure funding if possible but acknowledges that at this stage the Local Aspirational Leading Option does not fully replace the National Leading Option.

6.1.13 To decide whether a Local Aspirational Leading Option was required for an ODU, the project team considered the evidence collected during rounds 1-4 of stakeholder engagement to identify the key local opportunities, wants and needs for each ODU. In cases where a Local Aspirational Leading Option has been selected, these have been listed in the relevant section of this report to provide justification for the decision.

6.1.14 In many cases in the Strategy, the difference between the National Leading Option and the Local Aspirational Leading Option is often related to timing. For example, the National Leading Option may not recommend a new coastal defence until epoch 2 or 3 when the risk increases and the economic case provides justification to do so. However, there may

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be a local preference to construct a new defence sooner than this, for example, in epoch 1 to avoid losses or impacts on assets in the interim. Typically the earlier timing of capital interventions negatively impacts the benefit cost ratios of options as the cost of the capital intervention are discounted less than capital interventions undertaken at a later stage.

- 6.1.15 With respect to FCERM-GiA availability for the Local Aspirational Leading Options, this will be capped at the amount of FCERM-GiA available for the National Leading Option. Any Local Aspirational Leading Options will need to secure funding for all other costs.

Backup Option selection

- 6.1.16 On a national basis, funding availability is recognised as a constraint for delivering FCERM options and schemes. This is representative of the situation in the Strategy area and in most cases, both the National Leading Option and Local Aspirational Leading Option for each ODU would not be fully funded by FCERM-GiA. Significant funding shortfalls for both the leading National and Local Options are common.
- 6.1.17 It is the aspiration of both BCP and NFDC to work with funding partners to secure the additional funding to deliver the Strategy, however, it is recognised that this may not always be possible. Therefore, for each ODU where there is a large funding shortfall for the major capital scheme (i.e. > several £million) a Backup Option has also been identified.
- 6.1.18 The Backup Options do not typically involve large capital schemes to upgrade the standard of protection of defences and are instead focussed on more frequent defence maintenance / refurbishments. This means that the Backup Options typically have lower present value cost than the National / Local Aspirational Options and would be more deliverable as there would not be a large one-off funding shortfall associated with a major capital scheme. Instead smaller scale and less costly (but more frequent) interventions would be needed.

Partnership Funding

- 6.1.19 Where possible, indicative Partnership Funding scores have been calculated for the initial major capital schemes recommended by the leading options in the Strategy.
- 6.1.20 For the many of the leading options, the first major capital scheme is not outlined to occur until epoch 2 or 3. To work out indicative GiA availability the base date for the calculation has assumed a 'jump forward' in time to the time of the scheme.
- 6.1.21 There are many uncertainties associated with the indicative Partnership Funding calculations that are outlined in the Economic Appraisal Report (Appendix F) and the calculations should be viewed within the context of this uncertainty. The funding calculations therefore should be viewed as a way of illustrating approximate / hypothetical funding availability and to indicate the possible scale of contributions that are likely to be required to deliver the major schemes in the leading options.

6.2 SMZ 1 (Mundeford Sandbank)

Selecting the leading options

- 6.2.1 Table 6-1 presents the benefit cost assessment for the ODUs within SMZ 1. The options have been ranked according to NPV because the options are focussed on managing coastal erosion risk. For erosion risk options it is not possible to rank the options according to flooding AEP and use the incremental AEP decision thresholds.

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Table 6-1: Benefit-cost assessment for SMZ 1

Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
ODU 1 – Hengistbury Head East						
Do Nothing	Baseline option. No active intervention.	0	0	-	0	Provisional economic
Do Minimum	Small scale maintenance but defences may fail in the future.	340	0	-	-340	National
Managed Realignment	Refurbish defences at toe of cliff. Some cliff erosion would still occur due to slope processes and sea level rise but the process would be controlled.	2,823	0	-	-2,823	Local
Improve	Upgrade defences at toe of cliff to make more robust against sea level rise and minimise cliff erosion.	3,240	0	-	-3,240	
ODU 2 – Mudeford Sandbank						
Do Nothing	Baseline option. No active intervention	0	0	-	0	Provisional economic
Do Minimum	Small scale maintenance but defences may fail in the future.	680	0	-	-680	National
Maintain & Adaptation	Maintain option with PLR	5,456	89	0.02	-5,367	Local
Maintain	Undertake defence refurbishments and beach nourishment in the future. Some limited rollback of the Sandbank may occur but the shape / function of the Sandbank would be largely retained.	5,382	0	-	-5,382	
Managed Realignment	Actively facilitate rollback of the Sandbank in a controlled and proactive manner, moving and refurbishing rock defences as required.	5,382	0	-	-5,382	
Improve	Upgrade the defences in the long term and hold the Sandbank in its current position.	6,933	145	0.02	-6,788	

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ODU 1 (Hengistbury Head east)

- 6.2.2 Due to a lack of benefits directly attributed to this location, none of the short list options have an NPV above 0.
- 6.2.3 Do Nothing has the strongest economic case because it does not have a negative NPV and was therefore identified as the provisional economic leading option. However, Do Nothing is not acceptable from a technical perspective because it would lead to increased uncertainty in the morphology of the area, leading to reduced shelter to Christchurch Harbour and outflanking of the Hengistbury Head long groyne.
- 6.2.4 The next strongest option from an economic perspective is Do Minimum and therefore this has been identified as the National Leading Option. However, Do Minimum does not meet wider objectives and there would still be some uncertainty with this option in the long term if erosion were to occur if defences fail in the future.
- 6.2.5 Managed Realignment has therefore been identified as the Local Aspirational Option. This option would provide greater certainty from a technical perspective and would also lead to less environmental and social impacts. The expenditure required for the Local Aspirational Option would need to come from non-GiA sources. Wider local benefits (up to £7.7million) that are not presented in the economic comparison in Table 6-1 would justify the expenditure from a local economic perspective.

ODU 2 (Mundeford Sandbank)

- 6.2.6 Due to a lack of benefits directly attributed to this location, none of the short list options have an NPV above 0.
- 6.2.7 Do Nothing has the strongest economic case because it does not have a negative NPV and was therefore identified as the provisional economic leading option. However, Do Nothing is not acceptable from a technical perspective because it would lead to increased uncertainty in the morphology of the area, leading to unmanaged rollback of the Sandbank, exposure, and damage to buried services and reduced shelter to Christchurch Harbour.
- 6.2.8 The next strongest option from an economic perspective is Do Minimum and therefore this has been identified as the National Leading Option. However, Do Minimum does not meet wider objectives and there would still be some uncertainty with this option in the long term if rollback of the Sandbank were to occur if defences fail in the future.
- 6.2.9 Maintain with Adaptation has therefore been identified as the Local Aspirational Option. This option would provide greater certainty from a technical perspective and would lead to wider benefits such as reduced disruption to the beach huts and businesses on the Sandbank and would continue to support this area as an important recreation and tourism location. The expenditure required for the Local Aspirational Option would need to come from non-GiA sources. Wider local benefits (up to £14million) that are not presented in the economic comparison in Table 6-1 would justify the expenditure from a local economic perspective.

Sensitivity testing

Option cost

- 6.2.10 A key uncertainty in SMZ 1 relates to option cost. As outlined in the previous section, on a national basis there is already no economic case for either the National or Local Options

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due to a lack of nationally eligible benefits in SMZ 1. Therefore sensitivity testing the option cost will not change the comparison of options in the national context.

6.2.11 However, on a local basis, there are estimated to be up to £7.7million and £14million of benefits in ODU 1 and ODU 2 respectively that would be delivered by the Local Aspirational Option in these locations (these benefits not shown in Table 6-1 as they are not nationally eligible). These benefit amounts are approximately twice the estimated cost of the Local Aspirational Options and therefore even with a cost increase of 100% these options would still have a favourable economic case in the local cost / benefit context.

Details of the leading options

Technical aspects

6.2.12 The key strategic issue in SMZ 1 relates to the evolution and position of the shoreline in the future. Under a Do Nothing scenario, once existing defences fail then Hengistbury Head would erode and Mudeford Sandbank would be expected to roll back into Christchurch Harbour. This would lead to a number of risks and uncertainties:

- If the erosion to the headland and roll back of the Sandbank occur at different rates then a disconnect in the shoreline position could occur which would threaten the overall stability of the system and could lead to increased risk of breaching, with uncertain consequences for the wider area in terms of physical processes and habitats as well as adversely impacting the management intent in Poole Bay which is to prevent a breach into the harbour from that direction.
- Rollback of the Sandbank would expose buried services which would lead to them becoming damaged.
- Rollback of the Sandbank could be accompanied by other morphological changes such as flattening of the Sandbank. Changes in position or geometry of the Sandbank could lead to the Sandbank providing less shelter to Christchurch Harbour, impacting the flood risk in the Harbour itself.
- Unmanaged erosion of Hengistbury Head and rollback of the Sandbank would lead to erosion of the scheduled monument at Hengistbury Head and would lead to disruption to beach huts and businesses and loss of tourism value from the Sandbank. The Sandbank is a key attraction for visitors within the wider Strategy area and loss or damage to the Sandbank would likely have a wider impact on tourism within the Strategy frontage.
- Unmanaged erosion on the east side of the headland at Hengistbury Head could lead to outflanking of Hengistbury Head long groyne which is a key coastal defence for FCERM within Poole Bay and is shortly due to undergo refurbishment.

6.2.13 In SMZ 1, when appraised on a national basis, due to a lack of nationally eligible damages and benefits there is little economic justification for extensive FCERM interventions and therefore the National Option in both ODU 1 and 2 is to Do Minimum. Do Minimum would involve undertaking small scale maintenance of existing defences to prolong their service life. This would likely prevent the risks outlined above from occurring in the short term, but in the medium and long term there is uncertainty as to how long existing defences could be maintained and therefore some of the risks outlined above could occur.

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- 6.2.14 With this in mind a Local Aspirational Option has been identified in both ODUs which would require additional non-GiA funding but would minimise the likelihood of the risks outlined above from occurring and would provide increased confidence in the shoreline evolution in the medium and long term.
- 6.2.15 In ODU 1 the Local Aspirational Option is Managed Realignment. This would involve a series of refurbishments to the existing defences over time to reduce the amount of wave action at the cliff toe. There would still be some erosion over time due to cliff slope processes and erosion would not be stopped entirely, but the rate of erosion could be controlled and significant erosion of the headland would not be expected to occur.
- 6.2.16 In ODU 2 the Local Aspirational Option is Maintain with Adaptation. This would involve a series of refurbishments to the existing defences on the Sandbank (rock groynes, rock revetment and seawall) and beach nourishment to increase beach levels relative to sea level rise. Property level resilience measures would then be undertaken in the businesses on the Sandbank to help mitigate the consequences of flooding. The goal of this option is to sustain the shape, position and function of the Sandbank over the appraisal period. There may be some limited rollback / movement that occurs in response to storm events, but this would be controlled with beach management so that any movement occurs in unison with Hengistbury Head.
- 6.2.17 A full schedule of proposed works as part of the leading options is provided in the Economic Appraisal Report and Leading Options Report (Appendix F and C). As these are erosion defences, an indicative SoP for the defences has not been determined. Defence heights will need to be established during business case development, considering aspects such as wave run-up, rock sizing, and volume of beach nourishment required.

Environmental aspects

- 6.2.18 The Strategy HRA Appropriate Assessment concluded that the Local Aspirational Options in SMZ 1 would not have any adverse effects on the qualifying features, and thus the integrity of the Dorset Heaths SAC, the Dorset Heathlands SPA or the Solent and Dorset Coast SPA.
- 6.2.19 The Strategy WFD assessment concluded that beach nourishment in ODU 2 as part of the Local Aspirational option has the potential for water quality deterioration in the Coastal Dorset / Hampshire water body. These impacts can be mitigated accordingly and will be confirmed at scheme stage in the design and construction methodologies. Beach nourishment materials will come from licenced dredging areas which will have had separate environmental studies undertaken to confirm impacts.
- 6.2.20 The Strategy SEA assessment concluded that the Local Aspirational Options in SMZ 1 are likely to have an overall positive impact across most of the environmental categories. In categories where there is potential for minor negative impacts (such as the historic environment in ODU 1 due to the potential for some limited erosion of the Hengistbury Head scheduled monument), it is recommended that a programme of recording is established for heritage assets.
- 6.2.21 The MCZ assessment concluded that the leading options would have no significant risk to the conservation objectives of the Needles MCZ and Southbourne Rough MCZ.
- 6.2.22 There is potential for environmental enhancements and BNG as part of the Local Aspirational Options in SMZ 1; including opportunities for sand dune creation at ODU 2 that will be developed as part of the scheme implementation.

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Costs of the leading options

6.2.23 Table 6-2 presents the present value costs of the leading options in SMZ 1. Costs are presented by capital costs and time epoch.

Table 6-2 Present Value Costs of Leading Options in SMZ 1

ODU	Option	Cost	Epoch 1 (2024- 2044) (£K)	Epoch 2 (2044- 2074) (£K)	Epoch 3 (2074- 2144) (£K)	Total (£K)
1	Local Aspirational Option: Managed Realignment	Capital	1,459	632	454	2,545
		Non-Capital	137	91	50	278
		Total	1,596	724	503	2,823
2	Local Aspirational Option: Maintain with Adaptation	Capital	2,588	1,122	1,533	5,243
		Non-Capital	98	74	40	213
		Total	2,686	1,196	1,574	5,456

Contributions and funding

6.2.24 Where possible indicative Partnership Funding scores have been calculated for the initial capital schemes recommended by the leading options in the Strategy.

6.2.25 However, calculations have not been undertaken for SMZ 1 because both of the Local Aspirational Options do not have a benefit cost ratio above unity in the national benefits context therefore a Partnership Funding calculation would not be valid.

6.2.26 It is recognised that FCERM GiA for SMZ 1 will not be available and funding will need to come from other sources, such as Local Levy, Local Council, private investments etc.

6.2.27 In the Economic Appraisal Report (Appendix F) the local economic damages avoided / benefits for the leading options have been determined and will be used as justification for investment to support the leading options in SMZ 1.

6.3 SMZ 2 (Christchurch Harbour)

Selecting the leading options

6.3.1 Table 6-3 and Table 6-4 present the benefit cost assessment for the ODUs within SMZ 2. For ODUs 3, 4, 5, 6 and 11 the options have been ranked according to NPV (Table 6-3) and for ODUs 7, 9 and 10 the options have been ranked according to AEP (Table 6-4).

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Table 6-3: Benefit-cost assessment for SMZ 2 (NPV comparisons for ODUs 3, 4, 5, 6 & 11)

Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
ODU 3 – Christchurch Harbour South						
Adaptation / Resilience A	Property level resilience measures to properties at risk from flooding	118	669	5.67	551	Provisional Economic / National
Adaptation / Resilience B	Property level resilience measures to properties at risk from flooding, and localised erosion defences to Hengistbury Head access road	253	669	2.64	416	
Adaptation / Resilience C	Property level resilience measures to properties at risk from flooding, and localised erosion defences to Hengistbury Head access road and historic landfill site	776	811	1.05	35	Local
Do Nothing	Baseline option. No active intervention	-	0	-	-	
Do Minimum	Small scale maintenance but defences may fail in the future	44	0	-	-44	
Maintain A	Localised erosion defences to Hengistbury Head access road	204	0	-	-204	
Maintain B	Localised erosion defences to Hengistbury Head access road and historic landfill site	727	143	0.20	-584	
ODU 4 - Wick						
Sustain C	Upgrade setback defences incrementally over time to provide defined SoP.	1,468	3,586	2.44	2,118	Provisional Economic / National
Improve C	Same approach as Sustain C, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	2,889	3,850	1.33	961	
Sustain B	Upgrade setback defences incrementally over time to provide defined SoP. Refurbish quay wall to defend historic landfill site from erosion.	3,499	3,638	1.04	139	Local
Do Nothing	Baseline option. No active intervention.	-	0	-	-	
Do Minimum	Small scale maintenance but defences may fail in the future.	340	8	0.02	-332	
Improve B	Same approach as Sustain B, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	4,919	3,902	0.79	-1,017	
Maintain	Capital refurbishments to quay wall and setback flood embankment.	2,684	39	0.01	-2,645	
Sustain A	Upgrade defences incrementally over time to provide defined SoP. Construct new quay wall in epoch 1 with frontline defence that will also defend historic landfill site from erosion.	6,301	3,638	0.58	-2,663	

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Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
Improve A	Same approach as Sustain A, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	10,818	3,902	0.36	-6,916	
ODU 5 – Willow Drive and the Quomps						
Improve F	Same approach as Sustain F, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	11,383	34,424	3.02	23,041	Provisional Economic / National
Improve E	Same approach as Sustain E, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	13,953	36,424	2.61	22,471	
Improve D	Same approach as Sustain D, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	14,553	36,424	2.50	21,871	
Improve C	Same approach as Sustain C, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	13,660	34,439	2.52	20,779	Local
Sustain F	Upgrade defences incrementally over time to provide defined SoP. Same defence alignment as Sustain C but initial intervention from epoch 2.	11,059	31,752	2.87	20,693	
Sustain E	Upgrade defences incrementally over time to provide defined SoP. Same defence alignment as Sustain B but initial intervention from epoch 2.	13,943	33,449	2.40	19,506	
Sustain D	Upgrade defences incrementally over time to provide defined SoP. Same defence alignment as Sustain A but initial intervention from epoch 2.	16,547	33,449	2.02	16,902	
Sustain C	Upgrade defences incrementally over time from epoch 1 to provide defined SoP. Setback defence in east and west part of the unit.	15,398	31,769	2.06	16,371	
Improve B	Same approach as Sustain B, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	20,908	36,532	1.75	15,624	Local
Improve A	Same approach as Sustain A, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	22,507	36,532	1.62	14,025	Local
Sustain B	Upgrade defences incrementally over time from epoch 1 to provide defined SoP. Frontline defence in east part of the unit.	21,130	33,481	1.58	12,351	
Sustain A	Upgrade defences incrementally over time from epoch 1 to provide defined SoP. Setback defence in east part of the unit.	24,435	33,481	1.37	9,046	
Adaptation / Resilience	Capital refurbishments to quay wall and defences. PLR to properties at risk from flooding	11,927	16,526	1.39	4,599	Backup

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Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
Do Minimum	Small scale maintenance but defences may fail in the future.	340	820	2.41	480	
Do Nothing	Baseline option. No active intervention.	-	0	-	-	
Maintain	Capital refurbishments of quay wall and setback flood walls / defences	9,079	7,676	0.85	-1,403	
ODU 6 – River Avon West Bank						
Sustain B	New defences in the central flood cell of the unit in epoch 1 that would be raised incrementally over time to provide defined SoP. PLR measures to properties in southern flood cell of the unit.	3,278	3,666	1.12	388	Provisional Economic
Adaptation / Resilience	Capital refurbishments of quay walls. PLR to properties at risk of flooding	2,802	2,877	1.03	75	National
Do Nothing	Baseline option. No active intervention.	-	0	-	-	
Do Minimum	Small scale maintenance but defences may fail in the future.	170	0	-	-170	
Improve B	Same approach as Sustain B, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	4,988	3,783	0.76	-1,205	
Maintain	Capital refurbishments of existing quay walls.	1,519	0	-	-1,519	
Sustain A	New defences constructed in the central and southern flood cells of the unit in epoch 1 that would be raised incrementally over time to provide defined SoP.	7,877	4,519	0.57	-3,358	
Improve A	Same approach as Sustain A, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	10,252	5,774	0.56	-4,478	
ODU 11 – Mundeford Quay						
Do Nothing	Baseline option. No active intervention.	-	-	-	-	Provisional Economic
Do Minimum	Small scale maintenance but defences may fail in the future.	340	0	0	-340	National
Adaptation / Resilience	Capital refurbishments to quay walls. PLR to properties at risk from flooding.	9,530	680	0.07	-8,850	Local
Maintain	Capital refurbishments to quay walls.	9,350	10	0.00	-9,340	
Improve A	Same approach as Sustain A, except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	10,765	1,326	0.12	-9,439	

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Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
Sustain A	Capital refurbishments to quay walls and construction of new setback flood scheme around properties at risk in epoch 1. Flood defences raised incrementally over time to provide defined SoP.	10,688	1,188	0.11	-9,500	
Sustain B	Same as Sustain A, except new flood defence also constructed in epoch 1 to defend road (Chichester Way) from flooding.	11,615	1,188	0.10	-10,427	
Improve B	Same approach as Sustain B, except defences raised in one intervention to provide defined SoP for the end of the appraisal period.	11,801	1,326	0.11	-10,475	

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Table 6-4: Benefit-cost assessment for SMZ 2 (AEP comparisons for ODUs 7, 9 and 10)

Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
ODU 7 – Rossiters Quay						
Do Nothing	Baseline option. No active intervention.	-	0	-	-	
Do Minimum	Small scale maintenance but defences may fail in the future.	340	313	0.92	-27	
Maintain	Capital refurbishments to existing quay walls and setback defences.	1,975	1,672	0.85	-303	
Adaptation / Resilience	Capital refurbishments to existing quay walls and setback defences. PLR to properties at risk from flooding in the future.	2,630	3,253	1.24	632	Backup
Sustain A (75yr)	Construct new raised defences from epoch 2 and raise incrementally over time to provide defined SoP.	4,031	4,743	1.18	712	
Sustain A (200yr)		4,090	5,178	1.27	1,088	
Improve A (75yr)	Same approach as Sustain except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	4,060	5,244	1.29	1,184	
Improve A (200yr)		4,118	5,329	1.29	1,211	Provisional Economic / National
ODU 9 - Stanpit						
Do Nothing	Baseline option. No active intervention.	-	0	-	-	
Do Minimum	Small scale maintenance but defences may fail in the future.	510	1,293	2.54	783	
Maintain	Capital refurbishments to existing defences and strengthening of verge around historic landfill sites.	7,087	6,700	0.95	-387	
Adaptation / Resilience	Same as Maintain with the addition of PLR measures to properties at risk from flooding in the future.	8,271	12,554	1.52	4,283	Backup
Sustain A (75yr)	Construct new raised defences from epoch 2 and raise incrementally over time to provide defined SoP.	10,859	34,284	3.16	23,425	
Sustain A (200yr)		10,960	37,809	3.45	26,849	Provisional Economic / National
Improve A (75yr)	Same approach as Sustain except defence raised in one intervention to provide defined SoP for the end of the appraisal period.	11,760	37,632	3.20	25,872	
Improve A (200yr)		12,082	39,007	3.23	26,925	
ODU 10 - Mundeford						
Do Nothing	Baseline option. No active intervention.	-	0	-	-	
Do Minimum	Small scale maintenance but defences may fail in the future.	340	0	-	-340	
Maintain	Capital refurbishments to existing quay walls.	3,526	0	-	-3,526	
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Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
Adaptation / Resilience	Same as Maintain with the addition of PLR measures to properties at risk from flooding in the future.	5,473	2,777	0.51	-2,696	Backup
Improve A (75yr)	Construct new raised defences in epoch 3 to defined SoP at the of the appraisal period.	8,319	10,493	1.26	2,174	
Improve B (75yr)	Construct new raised defences in epoch 3 to defined SoP at the of the appraisal period. Different alignment to Improve A (setback in west part of unit)	9,003	10,493	1.17	1,490	
Improve A (200yr)	Construct new raised defences in epoch 3 to defined SoP at the of the appraisal period.	8,373	11,124	1.33	2,751	Provisional Economic / National
Improve B (200yr)	Construct new raised defences in epoch 3 to defined SoP at the of the appraisal period. Different alignment to Improve A (setback in west part of unit)	9,071	11,124	1.23	2,053	

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ODU 3 – Christchurch Harbour South

- 6.3.2 In Table 6-3 the short list options have been ranked according to NPV because the options are primarily focussed on managing coastal erosion risk. For erosion risk options it is not possible to rank the options according to flooding AEP and use the incremental AEP decision thresholds.
- 6.3.3 Adaptation / Resilience A has the strongest economic case with the largest NPV and was therefore identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option. However, Adaptation / Resilience A does not meet wider objectives because it does not include erosion defences to Hengistbury Head access road or the historic landfill sites.
- 6.3.4 Adaptation / Resilience C has therefore been identified as the Local Aspirational Option. This option would provide erosion defences to these areas and would therefore meet wider objectives and be favourable from an environmental perspective. The additional expenditure required for the Local Aspirational Option would need to come from non-GiA sources. Wider local benefits (up to £6.44million) that are not presented in the economic comparison in Table 6-3 would help justify the additional expenditure from a local economic perspective.

ODU 4 - Wick

- 6.3.5 The options in ODU 4 consider both flooding and erosion risk. The options cannot be ordered based on AEP as different areas are being defended in each of the options and the options have different strategic intentions such as including / excluding erosion defences. In Table 6-3 the options have therefore been ranked by NPV initially and then once the National Option was identified, additional IBCR testing was carried out to determine the desired SoP. As can be seen in Table 6-3, Sustain C has the strongest economic case with the largest NPV and was identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option.
- 6.3.6 Sustain C includes flood defences and therefore in Table 6-5 the AEP IBCR thresholds have been used to determine the desired SoP of these defences:
- For Sustain C the IBCR of moving from a 75yr SoP to a 200yr SoP is greater than the threshold in FCERM-AG (threshold of 3 required).
 - The IBCR of moving from a 200yr SoP to a higher SoP initially (the Improve C option would have an initial SoP higher than 1 in 200 years) is less than the next threshold in FCERM-AG (threshold of 5 required).
- 6.3.7 Based on the IBCR analysis, a 200yr SoP for Sustain C is recommended.

Table 6-5: IBCR comparison for ODU 4

	PV Costs (£k)	PV Benefits (£k)	Av. Benefit/Cost Ratio	Incremental BCR	Leading SoP
Sustain C (75yr SoP)	1,468	3,586	2.44	-	
Sustain C (200yr SoP)	1,490	3,898	2.62	14.18	X
Improve C (200yr SoP at end of appraisal period)	3,124	4,029	1.29	0.08	

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- 6.3.8 Sustain C does not meet wider objectives because it does not include refurbishments or replacement of the quay wall adjacent to the historic landfill site. This could lead to failure of this wall and erosion of the historic landfill site in the future.
- 6.3.9 Sustain B has therefore been identified as the Local Aspirational Option. This option would involve refurbishing the quay wall to prevent erosion of the historic landfill. This is more favourable from a wider objective and environmental perspective. The additional expenditure required for the Local Aspirational Option would need to come from non-GiA sources.

ODU 5 – Willow Drive and the Quomps

- 6.3.10 The options in ODU 5 consider both flooding and erosion risk. The options cannot be ordered based on AEP as different areas are being defended in each of the options and the options have different strategic intentions such as including / excluding erosion defences. In Table 6-3 the options have therefore been ranked by NPV initially and then once the National Option was identified, additional IBCR testing was carried out to determine the desired SoP. As can be seen in Table 6-3, Improve D-F have the strongest economic case with the largest NPVs. Each of these options is similar in intent but would be delivered using different defence alignments. It is too early in the appraisal of these options to identify an exact alignment (further work would be needed during business case development) and therefore each of these options has been identified as provisional economic options. After considering uncertainty and sensitivity tests, these options were retained and identified as the National Options.
- 6.3.11 Improve D-F includes flood defences and therefore in Table 6-6 the AEP IBCR thresholds have been used to determine the desired SoP of these defences:
- For each of these options, the IBCR of moving to a 200yr SoP is greater than the threshold in FCERM-AG (threshold of 3 required)
 - Higher SoPs than 1 in 200 year have not been tested as this SoP is already high being the target for end of the appraisal period with the Improve D-F options.
- 6.3.12 Based on the IBCR analysis, a 200yr SoP is recommended.

Table 6-6: IBCR comparison for ODU 5

	PV Costs (£k)	PV Benefits (£k)	Av. Benefit/Cost Ratio	Incremental BCR	Leading SoP
Improve D:					
Improve D (75yr SoP)	14,553	36,424	2.50	-	
Improve D (200yr SoP)	14,702	37,306	2.54	5.92	X
Improve E:					
Improve E (75yr SoP)	13,953	36,424	2.61	-	
Improve E (200yr SoP)	14,059	37,306	2.65	8.32	X
Improve F:					
Improve F (75yr SoP)	11,383	34,424	3.02	-	
Improve F (200yr SoP)	11,397	35,206	3.09	55.86	X

- 6.3.13 Improve D-F does not involve an immediate intervention (new defences not constructed until epoch 2. There is a local aspiration to intervene sooner than this to provide increased confidence in the status of the frontline quay wall in this location because there is historic landfill located landward.

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6.3.14 Improve A-C have therefore been identified as the Local Aspirational Options. This option would involve an earlier intervention in epoch 1 and provide increased confidence in the robustness of the defences over the short term. The additional expenditure required for the Local Aspirational Option would need to come from non-GiA sources.

6.3.15 The Adaptation / Resilience option was identified as a Backup Option in case funding for either the National or Local Options could not be secured.

ODU 6 – River Avon West Bank

6.3.16 The options in ODU 6 consider both flooding and erosion risk. The options cannot be ordered based on AEP as different areas are being defended in each of the options and the options have different strategic intentions. In Table 6-3 the options have therefore been ranked by NPV. As can be seen in Table 6-3, Sustain B has the strongest economic case with the largest NPV and was identified as the provisional economic leading option. However, upon further sensitivity testing, this option is not considered to be deliverable (see sensitivity testing section for more details).

6.3.17 The Adaptation / Resilience option has the next strongest economic case and was therefore selected as the National Option.

6.3.18 No Local Aspirational Option was identified for ODU 6.

ODU 7 – Rossiters Quay

6.3.19 The options in ODU 7 are primarily focussed on managing flood risk and have the same benefit areas / strategic intentions. Therefore in Table 6-4 it has been possible to order the options by reducing AEP (increasing SoP). As can be seen in Table 6-4, the option with the highest ABCR is Improve A (200yr SoP) and this option was therefore identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option.

6.3.20 Improve A provides the highest SoP of the options considered and whilst it was identified as the National Option, for completeness a comparison of the IBCR between the lower SoPs has been undertaken and presented in Table 6-7:

- For Sustain A the IBCR of moving to a 200yr SoP is greater than the threshold in FCERM-AG (threshold of 3 required).
- The IBCR of moving to Improve A with an even higher SoP initially (the Improve A option would have an initial SoP higher than 1 in 200 years) is 5.39 which is above the threshold (threshold of 5 required).

6.3.21 The IBCR analysis confirms Improve A (200yr SoP) as the recommended SoP.

Table 6-7: IBCR comparison for ODU 7

	PV Costs (£k)	PV Benefits (£k)	Av. Benefit/Cost Ratio	Incremental BCR	Leading SoP
Sustain A (75yr SoP)	4,031	4,743	1.18	-	
Sustain A (200yr SoP)	4,090	5,178	1.27	7.37	
Improve A (200yr SoP at end of appraisal period)	4,118	5,329	1.29	5.39	X

6.3.22 No Local Aspirational Option was identified for ODU 7. The Adaptation / Resilience Option has been identified as a Backup Option in case funding for the National Option could not be secured.

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ODU 9 – Stanpit

6.3.23 The options in ODU 9 have the same benefit areas in terms of flood risk reduction and have the same strategic intentions with regards to defending the historic landfill sites. Therefore in Table 6-4 it has been possible to order the options by reducing AEP (increasing SoP). As can be seen in Table 6-4, the option with the highest ABCR is Sustain A (200yr SoP) and this option was therefore identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option.

6.3.24 Sustain A includes flood defences and therefore in Table 6-8 the AEP IBCR thresholds have been used to confirm the desired SoP of these defences:

- For Sustain A the IBCR of moving to a 200yr SoP is greater than the threshold in FCERM-AG (threshold of 3 required), and therefore the 200yr SoP is recommended.
- The IBCR of moving to a higher SoP initially (the Improve A option would have an initial SoP higher than 1 in 200 years) is less than the next threshold (threshold of 5 required).

6.3.25 The IBCR analysis confirms Sustain A (200yr SoP) as the recommended SoP.

Table 6-8: IBCR comparison for ODU 9

	PV Costs (£k)	PV Benefits (£k)	Av. Benefit/Cost Ratio	Incremental BCR	Leading SoP
Sustain A (75yr SoP)	10,859	34,284	3.16	-	
Sustain A (200yr SoP)	10,960	37,809	3.45	34.90	X
Improve A (200yr SoP at end of appraisal period)	12,082	39,007	3.23	1.07	

6.3.26 No Local Aspirational Option was identified for ODU 9. The Adaptation / Resilience Option has been identified as a Backup Option in case funding for the National Option could not be secured.

ODU 10 – Mundeford

6.3.27 The options in ODU 10 have the same benefit areas in terms of flood risk reduction. Therefore in Table 6-4 it has been possible to order the options by reducing AEP (increasing SoP). As can be seen in Table 6-4, the option with the highest ABCR is Improve A (200yr SoP) and this option was therefore identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option.

6.3.28 Improve A provides the highest SoP of the options considered and whilst it was identified as the National Option, for completeness a comparison of the IBCR between the lower SoPs has been undertaken and presented in Table 6-9:

- For Improve A (75yr SoP) the IBCR of moving to a 200yr SoP is greater than the threshold in FCERM-AG (threshold of 3 required), and therefore the 200yr SoP is recommended.
- Higher SoPs than 1 in 200 year have not been tested as this SoP is already high being the target for end of the appraisal period with the Improve A option.

6.3.29 The IBCR analysis confirms Improve A (200yr SoP) as the recommended SoP.

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Table 6-9: IBCR comparison for ODU 10

	PV Costs (£k)	PV Benefits (£k)	Av. Benefit/Cost Ratio	Incremental BCR	Leading SoP
Improve A (75yr SoP)	8,319	10,493	1.26	-	
Improve A (200yr SoP at end of appraisal period)	8,373	11,124	1.33	11.69	X

6.3.30 No Local Aspirational Option was identified for ODU 10. The Adaptation / Resilience Option has been identified as a Backup Option in case funding for the National Option could not be secured.

ODU 11 (Mudford Quay)

6.3.31 In Table 6-3 the short list options have been ranked according to NPV because the options are primarily focussed on managing coastal erosion risk. For erosion risk options it is not possible to rank the options according to flooding AEP and use the incremental AEP decision thresholds. Due to a lack of benefits directly attributed to this location, none of the short list options have an NPV above 0.

6.3.32 Do Nothing has the strongest economic case because it does not have a negative NPV and was therefore identified as the provisional economic leading option. However, Do Nothing is not acceptable from a technical perspective because it would lead to increased uncertainty in the morphology of the area, potentially leading increased wave activity, exposure and damage to buried services and reduced shelter to Christchurch Harbour.

6.3.33 The next strongest option from an economic perspective is Do Minimum and therefore this has been identified as the National Leading Option. However, Do Minimum does not meet wider objectives and there would still be some uncertainty with this option in the long term if defences fail in the future and Mudford Quay is eroded / lost.

6.3.34 Adaptation / Resilience has therefore been identified as the Local Aspirational Option. This option would provide greater certainty from a technical perspective and would lead to wider benefits such as reduced disruption and would continue to support this area as an important recreation and tourism location. The expenditure required for the Local Aspirational Option would need to come from non-GiA sources. Wider local benefits (up to £14.6million) that are not presented in the economic comparison in Table 6-3 would justify the expenditure from a local economic perspective.

Sensitivity testing

6.3.35 A range of sensitivity tests have been undertaken on the option appraisal in SMZ 2. These are summarised below and further details can be found in the Economic Appraisal Report (Appendix F).

Option cost

6.3.36 A key uncertainty for the options in SMZ 2 relates to option cost. Sensitivity tests that increase the National Options costs by 10% and 25% have been undertaken to determine whether the increase in cost would change the choice of the National Options. In summary, the results of the cost sensitivity tests and interpretation did not lead to changes in the choice of the National Option in any of the ODUs.

- In many ODUs a rise in the National Option costs by 10-25% would not impact which option had the strongest economic case.

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- In ODUs where a different option would have a stronger economic case as a result of the National Option costs increasing by 10-25%, due to similar packages of measures between options, similar cost increases would be expected to occur with the alternative options. This would negate the economic advantage that alternative options may have over the National Option and no changes would be recommended.

Increased sea level rise

- 6.3.37 Another uncertainty for the options in SMZ 2 is the amount of sea level rise that could occur over the appraisal period. A sensitivity test was undertaken whereby the height of defences in each short option was increased by 0.9m. This equates to the difference between the H++ sea level rise scenario and the sea level rise value used in the Strategy appraisal.
- 6.3.38 Raising the height of all defences in a short list option would affect different options differently, as the option cost would be impacted to varying extents based on the package of measures that comprise an option. However, in general the results of the sea level rise sensitivity test show that the economic case of all options would be weaker, but the choice of National Option would remain unchanged.

Consideration of funding mechanism – ODU 6

- 6.3.39 In ODU 6 there are two main flood cells. The main uncertainty associated with the provisional economic leading option (Sustain B) was whether the proposed defences for each flood cell would be deliverable in isolation. This was particularly important given the different pathways and funding mechanisms that could be followed here to deliver the measures in each flood cell.
- 6.3.40 In the south part of the unit, the property level protection could be delivered by individual property owners with support / coordination from BCP Council. The property owners may have access to flood resilience grants to help with funding. However, the flood defences in the north part of the unit would be a capital scheme, most likely with an aspiration to use FCERM-GiA if available and other funding sources.
- 6.3.41 If the benefits / costs from the property level protection in the south part of the unit were removed from the overall option, the economic viability of the flood defences in the north part of the unit was uncertain, which would impact FCERM-GiA availability. Therefore a sensitivity test was undertaken to determine the economic case of the flood defences in the north part of the unit in isolation.
- 6.3.42 The sensitivity test showed that the ABCR of the flood defences in the north part of the unit was below unity (if this was delivered in isolation) and there would be no economic justification to proceed with this part of the option.
- 6.3.43 Based on the results of this sensitivity test the choice of National Option is different to the provisional leading economic option in ODU 6.

Details of the leading options

Technical aspects

- 6.3.44 The key strategic issues in SMZ 2 include:
- The impact of sea level rise on the flood risk within Christchurch Harbour and the uncertainty around this; and

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- The erosion risk to historic landfill sites around Christchurch Harbour, such as at Stanpit, Wick and the Quomps.

6.3.45 The leading options in SMZ 2 have been selected to manage these strategic issues effectively, in a proactive and pragmatic way, recognising future uncertainty and potential funding limitations.

6.3.46 In each ODU within SMZ 2, where there is an economic case to do so, the National Option recommends upgraded flood defences to reduce the risk to properties and historic assets within the area. The National Options outline a phased programme of upgrades that are required based on the onset of risk that is expected according to the latest UKCP18 sea level rise projections. However, should sea levels rise faster or slower than anticipated, then the recommended defence upgrades can be brought forward or delayed accordingly, without impacting the overall success of the options.

6.3.47 In the National Options the upgraded flood defences are recommended in ODUs 4, 5, 7, 9 and 10 at various points in time in the future. These are the ODUs where the vast majority of properties, assets and infrastructure are expected to be at risk from flooding within SMZ 2. In total these options will reduce the flood risk to over 1900 properties over the appraisal period.

6.3.48 In ODUs 3, 6 and 11, there are only a small number of properties anticipated to be at risk from flooding over the appraisal period and there is not an economic case to construct new or upgraded flood defences to manage this risk. Instead, property level resilience measures are recommended as part of the National Leading Options in these locations.

6.3.49 In some ODUs (ODUs 5 and 9), it has been possible to incorporate defences to the historic landfill sites as part of the National Option. This has been possible where either the defences to historic landfill site would be dual purpose (i.e. flooding and erosion risk) or where there is a strong enough economic case in the unit to include additional expenditure on frontline defences to defend the historic landfill sites.

6.3.50 However, in other locations (ODUs 3, 4 and 11), due to economic limitations it has not been possible to incorporate erosion defences to the historic landfill sites as part of the National Option. Therefore in these locations a Local Aspirational Option has also been identified that includes erosion defences or frontline wall refurbishments to defend historic landfill sites from erosion.

6.3.51 A full schedule of proposed works as part of the leading options is provided in the Economic Appraisal Report (Appendix F). An indicative SoP for the defences has been identified as outlined previously. However, the SoP will need to be reappraised as part of business case development, including further consideration of defence heights and alignments.

Environmental aspects

6.3.52 The conclusions and suggested mitigations of the Strategy HRA Appropriate Assessment for the leading options in SMZ 2 are summarised in Table 6-10 below.

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Table 6-10: Summary of HRA Appropriate Assessment for SMZ 2

European site	Recommendations / Mitigation
Dorset Heathlands SPA	ODU 3 – in order to avoid adverse effects on hen harrier and merlin it is recommended to time the works of the Local Aspirational Option outside the over-wintering bird season
River Avon SAC	<p>ODU 7 – due to space constraints the National Option could cause temporary habitat loss and mitigation would be required during construction. The relevant works are not planned until epoch 2. Permanent habitat loss likely to be minimal but could be compensated for in ODU 3. This should be considered during erosion defence alignment decision here.</p> <p>ODU 6, 7 and 9 – works on frontline defences as part of the National Option that could affect the river bed should be undertaken at low tide</p>
Avon Valley SPA / Ramsar	ODU 7 – due to space constraints the National Option could cause temporary habitat loss and mitigation would be required during construction. The relevant works are not planned until epoch 2. Permanent habitat loss likely to be minimal but could be compensated for in ODU 3. This should be considered during erosion defence alignment decision here.

6.3.53 The Strategy WFD assessment identified a range of potential impacts of the leading options on WFD objectives in SMZ 2 but identified suitable mitigation:

- At the Strategy stage there is considerable uncertainty in defence alignments for the leading options in SMZ 2 but there is a commitment to keeping any new defences within the footprints of existing defences where possible during scheme design. This will help to minimise impacts on WFD objectives.
- Construction will need to consider seasonal working to avoid impacts on sensitive species and construction methodologies will need to be developed in line with the EA’s Pollution Prevention guidance.
- In parts of ODUs 3, 9 and 10 there is potential for coastal squeeze of intertidal habitats in locations where the existing defence line may be held in place (subject to defence alignment decisions during scheme appraisal). The intertidal habitats are not qualifying features of the European sites but the WFD still recommended that any habitat loss is quantified at scheme level (once defence alignments are known). If the scheme appraisal identifies the need for mitigation / compensatory habitat then this should be agreed accordingly with assistance from the Regional Habitat Creation Programme. There is potential for defence realignment in parts of ODU 3 to create new intertidal habitat and this could be explored during scheme appraisal.
- In ODU 3, 4 and 11 there is potential for impacts to water quality to occur with the National Options if historic landfill sites erode, although it is recognised that further investigations to determine the contaminations status of these sites are required. Delivering the Local Aspirational Options in these locations would include defences to these sites and reduce this risk.

6.3.54 The Strategy SEA assessment concluded that the leading options in SMZ 2 are likely to have an overall positive impact across most of the environmental categories. In some areas there is potential for negative impacts to the historic environment due to residual flood risk and it is recommended that at scheme stage resilience measures and heritage impact assessments are undertaken, as well as a programme of recording for heritage assets.

6.3.55 The MCZ assessment concluded that the leading options would have no significant risk to the conservation objectives of the Needles MCZ and Southbourne Rough MCZ.

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6.3.56 There is potential for environmental enhancements and BNG as part of the leading options in SMZ 2; including opportunities for saltmarsh restoration and creation in multiple locations that will be developed as part of scheme implementation.

Costs of the leading options

6.3.57 Table 6-11 presents the present value costs of the leading options in SMZ 2. Costs are presented by capital costs and time epoch.

Table 6-11 Present Value Costs of Leading Options in SMZ 2

ODU	Option	Cost	Epoch 1 (2024-2044) (£K)	Epoch 2 (2044-2074) (£K)	Epoch 3 (2074-2144) (£K)	Total (£K)
3	Local Aspirational Option: Adaptation / Resilience C	Capital	378	164	118	660
		Non-Capital	48	45	24	116
		Total	426	209	142	776
4	Local Aspirational Option: Sustain B	Capital	1,632	931	732	3,294
		Non-Capital	101	67	36	204
		Total	1,733	998	768	3,499
5	Local Aspirational Option: (Improve B shown for reference)	Capital	19,913	0	859	20,772
		Non-Capital	67	45	24	136
		Total	19,980	45	883	20,908
6	National Option: Adaptation / Resilience	Capital	1,572	708	455	2,734
		Non-Capital	34	22	12	68
		Total	1,605	730	467	2,802
7	National Option: Improve A	Capital	0	4016	0	4016
		Non-Capital	34	45	24	103
		Total	34	4061	24	4118
9	National Option: Sustain A	Capital	0	9,487	1,269	10,756
		Non-Capital	101	67	36	204
		Total	101	9,554	1,306	10,960
10	National Option: Improve A	Capital	2,550	658	5,028	8,236
		Non-Capital	67	45	24	136
		Total	2,618	703	5,052	8,373
11	Local Aspirational Option: Adaptation / Resilience	Capital	5,411	2,363	1,689	9,462
		Non-Capital	34	22	12	68
		Total	5,445	2,384	1,701	9,530

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Contributions and funding

- 6.3.58 Where possible indicative Partnership Funding scores have been calculated for the initial major capital schemes recommended by the leading options in the Strategy.
- 6.3.59 For the majority of the leading options in SMZ 2, the first major capital scheme is not outlined to occur until epoch 2 or 3. To work out indicative GiA availability the base date for the calculation has assumed a 'jump forward' in time to the time of the scheme.
- 6.3.60 Table 6-12 below presents the indicative funding scores. In ODUs where a Local Aspirational Option has been identified, the funding score for this option is shown. In ODUs where no Local Aspirational Option has been identified, the score for the National Option is shown. The funding scores for all the leading options are shown in Appendix F. *Note that the costs and benefits presented in this table are different to the values presented in the option appraisal due to a different base year and appraisal period duration.*
- 6.3.61 As can be seen, the funding scores range between 8-20% and therefore significant non-GiA funding is expected to be required to deliver the Strategy leading options (note that funding scores for National Options in SMZ 2 increase to 40% but significant non-GiA funding still required). BCP as an outcome of the Strategy have committed to developing a funding and implementation plan for the Strategy which will identify where funding will be obtained.
- 6.3.62 No Partnership Funding scores were calculated for ODUs 3, 6 and 11 as the leading options in these units are a combination of maintenance / PLR.
- 6.3.63 Where there is a large amount of non-GiA funding required to deliver either the National and/or Local Aspirational Options in a unit then Backup Options have been identified (ODUs 5, 7, 9 and 10). These Backup Options do not involve large capital schemes to upgrade defences and therefore the one-off funding needs for schemes are less and more deliverable.

Table 6-12: Indicative Partnership Funding scores for major capital schemes as part of the Leading Options in SMZ 2

ODU	Option	Capital scheme	PV cost (£k)	PV benefits (£k)	Indicative PF score	PV maximum eligible GiA (£k) for upfront costs	Minimum contribution / savings required (£k) for upfront cost
4	Local: Sustain B	Epoch 3	3,995	11,665	20%	775	3,013
5	Local: Improve B	Epoch 1	21,121	37,417	13%	2,536	17,589
7	National: Improve A	Epoch 2	8,121	8,535	8%	630	7,360
9	National: Sustain A	Epoch 2	21,365	45,966	16%	2,985	15,892
10	National: Improve A	Epoch 3	25,598	28,074	8%	2,093	23,394

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6.4 SMZ 3 (Christchurch Beaches and Cliffs)

Selecting the leading options

6.4.1 Table 6-13 presents the benefit cost assessment for the ODUs within SMZ 3. The options have been ranked according to NPV because the options are focussed on managing coastal erosion risk. For erosion risk options it is not possible to rank the options according to flooding AEP and use the incremental AEP decision thresholds.

ODU 12 – Avon Beach and Friars Cliff

6.4.2 Improve A has the strongest economic case with the largest NPV and was therefore identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option.

6.4.3 This area is key for tourism and recreation and there are aspirations in this area to improve the public realm, especially in the future when higher / larger sea defences will be required.

6.4.4 Improve C has therefore been identified as the Local Aspirational Option. This option would provide public realm enhancements as well as bringing forward the defence upgrades and beach nourishment, to provide more certainty in the short term and reduce the reliance on existing defences that are ageing. The additional expenditure required for the Local Aspirational Option would need to come from non-GiA sources. Wider local benefits that are not presented in the economic comparison in Table 6-13 could be considered to help justify the additional expenditure. The economic appraisal has identified up to £80million of local damages that could be avoided by either the National or Local Options. Public realm enhancements with the Local Option could differentiate this option and lead to additional recreation / tourism benefits that have not been calculated in the Strategy.

ODU 13 – Highcliffe

6.4.5 Improve C has the strongest economic case with the largest NPV and was therefore identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option. This option does not include a beach nourishment scheme until epoch 3 which could lead to increased uncertainty before this point in time, particularly in the medium term (i.e. epoch 2) as the beach response to sea level rise is difficult to predict. Improve A has therefore been selected as the Local Aspirational Option as this option brings forward the start of beach nourishment interventions into epoch 2 which will reduce uncertainty.

6.4.6 The Managed Realignment options were considered in detail in this location but the project team decided not to pursue these options due to increased uncertainty, risk of causing instability at Highcliffe and a weaker economic case. Beach levels to the east will instead be managed holistically with beach management activities. More details can be found in the Leading Options report (Appendix C).

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Table 6-13: Benefit-cost assessment for SMZ 3 (NPV comparisons for ODUs 12 and 13)

Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
ODU 12 – Avon Beach and Friars Cliff						
Improve A	Refurbish existing seawall and revetment in epoch 1 and undertake defence upgrades and beach nourishment in epoch 2	8,443	8,978	1.06	535	Provisional Economic / National
Do Nothing	Baseline option. No active intervention.	-	-	-	-	
Do Minimum	Small scale maintenance but defences may fail in the future.	510	162	0.32	-348	
Improve B	Construct new linear defences along length of frontage (no beach nourishment)	11,398	8,978	0.79	-2,420	
Improve C	As per Improve A but undertake defence upgrades and beach nourishment in epoch 1 and also deliver public realm improvements	14,030	8,978	0.64	-5,052	Local
Maintain	Capital refurbishments of existing defences and beach recycling	9,412	3,454	0.37	-5,958	
ODU 13 - Highcliffe						
Improve C	As Improve A, except beach nourishment would be undertaken in epoch 3.	5,431	6,946	1.28	1,515	Provisional Economic / National
Improve A	Construct outflanking defence in epoch 1. In epoch 2 refurbish existing defences and undertake beach nourishment.	6,689	6,946	1.04	257	Local
Do Nothing	Baseline option. No active intervention.	-	0			
Do Minimum	Small scale maintenance but defences may fail in the future.	177	0	-	-177	
Improve B	Construct outflanking defence in epoch 1. In epoch 2 construct new larger cliff toe defences (no beach nourishment)	7,918	6,946	0.88	-972	
Managed Realignment A	As Improve A, except also reduce length of groynes in epoch 1 to promote greater movement of material from west to east, into ODU 14.	7,562	6,577	0.87	-985	
Maintain	Capital refurbishments of existing defences and beach recycling	5,310	2,545	0.48	-2,765	
Managed Realignment B	As Managed Realignment A, except offshore breakwaters also constructed to help defend cliff toe and promote movement of material from west to east, into ODU 14.	11,474	6,577	0.57	-4,897	

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Sensitivity testing

6.4.7 A range of sensitivity tests have been undertaken on the option appraisal in SMZ 3. These are summarised below and further details can be found in Appendix F (economics report).

Option cost

6.4.8 A key uncertainty for the options in SMZ 3 relates to option cost. Sensitivity tests that increase the National Options costs by 10% and 25% have been undertaken to determine whether the increase in cost would change the choice of the National Options.

6.4.9 In summary, the results of the cost sensitivity tests and interpretation did not lead to changes in the choice of the National Option in any of the ODUs.

- In ODU 12 a rise in the National Option costs by 10-25% would reduce the ABCR to below unity. In this case there would be no economically viable alternatives so changing the choice of option in this basis is not justified.
- In ODU 13 a rise in the National Option costs by 10-25% would not impact the choice of National Option.

Cost of beach nourishment

6.4.10 A high proportion of the costs of the leading options in ODUs 12 and 13 are associated with beach nourishment. The beach nourishment cost applied in the economic appraisal was approximately £33 per m³ of material which is considered a reasonably, mid-level estimate of nourishment costs at the Strategy level. However, there could be potential to reduce this cost if local sources of material are used, or if material with different characteristics (i.e. coarser) is used.

6.4.11 A sensitivity test has been undertaken to determine whether a 50% lower beach nourishment cost changes the choice of the National Option.

6.4.12 In summary, the choice of National Option in ODUs 12 and 13 would remain unchanged with a 50% lower beach nourishment cost and therefore there is no justification to change the National Option on this basis.

Details of the leading options

Technical aspects

6.4.13 The main risk in SMZ 3 is from coastal erosion. Erosion would occur if existing defences at the top of the beach were not refurbished and left to fail and to a lesser extent if the defences were not upgraded in response to sea level rise.

6.4.14 The longshore movement of beach material within Christchurch Bay is also a key strategic issue along the open coast. Currently there is general movement of material from west to east. Existing defences at Highcliffe at the eastern end of SMZ 3 are effective at retaining beach material and this area has historically been used as an area of supply for beach management activities in ODUs 12 and 13.

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- 6.4.15 To the east of the Highcliffe defences there is a stretch of undefended cliff at Naish Cliff. This area is actively eroding and continued erosion could threaten the Highcliffe defences by outflanking.
- 6.4.16 The National Options in ODUs 12 and 13 involve refurbishing and upgrading existing toe defences and would be combined with beach nourishment to ensure that continued protection is provided to the toe of the cliffs in this location. This would reduce the risk of any erosion from occurring in the future and defend over 300 properties. In addition, outflanking defences would be constructed in epoch 1 in ODU 13 to reduce the risk of outflanking from the undefended area to the east.
- 6.4.17 The Local Options in ODU 12 and 13 are largely the same as the National Options but bring forward in time the initial interventions to provide more certainty in the short and medium terms.
- 6.4.18 The National and Local Options would work with the natural movement of beach material in this location which is predominantly from west to east. As part of the leading options it is recommended that a bay wide Beach Management Plan is produced that draws on analysis of beach monitoring.
- 6.4.19 In the future it is likely that beach material will continue to accumulate at the Highcliffe area and therefore this area could continue to be used as an area of supply for beach recycling activities within ODUs 12 and 13.
- 6.4.20 The beach nourishment included in the National and Local Options in SMZ 3 will ensure that the beach continues to provide toe protection with rising sea levels in this location. With the recommended upgrades to the groynes in ODU 12 and continued maintenance of the groynes in ODU 13, the majority of the beach nourishment material would be expected to stay within SMZ 3. However, the increased beach levels as a result of the beach nourishment could lead to some bypassing of material around the defences in SMZ 3, moving to the east into SMZ 4 and beyond. If this was to occur it would likely to be a positive development for management of beach levels within the bay as a whole.
- 6.4.21 Depending on the amount of bypassing that is being observed at Highcliffe, there could be merit in supplementing this with additional beach recycling that moves material a short distance from Highcliffe to Naish Cliff. This would provide a more holistic bay wide beach management approach and benefit Barton on Sea and Milford on Sea defences to the east. In addition, the bypassing of material to the east past could be purposefully incorporated into the design of the beach nourishment schemes in SMZ 3.
- 6.4.22 A full schedule of proposed works as part of the leading options is provided in the Economics Appraisal report (Appendix F). As these are erosion defences, an indicative SoP for the defences has not been determined. Defence heights will need to be established during business case development, considering aspects such as wave run-up, rock sizing, and volume of beach nourishment required.

Environmental aspects

- 6.4.23 The Strategy HRA Appropriate Assessment concluded that the Local Aspirational Options in SMZ 3 would not have any adverse effects on the qualifying features, and thus the integrity of the Solent and Dorset Coastal SPA (Marine Components GB).
- 6.4.24 The Strategy WFD assessment identified a range of potential impacts of the leading options on WFD objectives in SMZ 3 but identified suitable mitigation:

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- At the Strategy stage there is considerable uncertainty in defence alignments for the leading options in SMZ 3. Where possible during scheme design there is a commitment to minimise new defence footprints within European sites and aim to keep footprints within those of existing defences. This will help to minimise impacts on WFD objectives.
- Construction will need to consider seasonal working to avoid impacts on sensitive species and construction methodologies will need to be developed in line with the EA's Pollution Prevention guidance.
- Beach nourishment has the potential to lead to water quality deterioration and therefore appropriate mitigation during construction will be required. Beach nourishment materials will come from licenced dredging areas which will have had separate environmental studies undertaken to confirm impacts.

6.4.25 The Strategy SEA assessment concluded that the leading options in SMZ 3 are likely to have a major overall positive impact across the majority of the environmental categories.

6.4.26 The MCZ assessment concluded that the leading options would have no significant risk to the conservation objectives of the Needles MCZ and Southbourne Rough MCZ.

6.4.27 There is potential for environmental enhancements and BNG as part of the Leading in SMZ 3; including opportunities for rock pool creation / intertidal habitat creation within defences that will be developed as part of the scheme implementation.

Costs of the leading options

6.4.28 Table 6-14 presents the present value costs of the leading options in SMZ 3. Costs are presented by capital costs and time epoch.

Table 6-14 Present Value Costs of Leading Options in SMZ 3

ODU	Option	Cost	Epoch 1 (2024-2044) (£K)	Epoch 2 (2044-2074) (£K)	Epoch 3 (2074-2144) (£K)	Total (£K)
12	Local Aspirational Option: Improve C	Capital	12,880	468	364	13,712
		Non-Capital	146	97	75	318
		Total	13,025	565	439	14,030
13	Local Aspirational Option: Improve A	Capital	482	4,509	1,334	6,325
		Non-Capital	179	119	65	363
		Total	661	4,628	1,399	6,689

Contributions and funding

6.4.29 Where possible indicative Partnership Funding scores have been calculated for the initial major capital schemes recommended by the leading options in the Strategy.

6.4.30 For the majority of the leading options in SMZ 3, the first major capital scheme is not outlined to occur until the future. To work out indicative GiA availability the base date for the calculation has assumed a 'jump forward' in time to the time of the scheme.

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6.4.31 Table 6-15 below presents the indicative funding scores. The funding scores for all the leading options are shown in the Economics Appraisal Report (Appendix F). For the purpose of Table 6-15, for ODU 12 the National Option (Improve A) has been shown in rather than the Local Option because the main difference between the two options is public realm enhancements that would not be covered by GiA. Note that the costs and benefits presented in this table are different to the values presented in the option appraisal due to a different base year and appraisal period duration.

6.4.32 As can be seen, the funding scores range between 15-17% and therefore significant non-GiA funding is expected to be required to deliver the Strategy leading options.

6.4.33 Backup Options have been identified for each ODU that involve smaller volumes of beach nourishment in each location. These would be lower cost options and more deliverable but would not be expected to provide a wider benefit to beach levels outside of SMZ 3 as beach levels would be lower and less material would be expected to bypass any defences and move east into SMZ 4.

Table 6-15: Indicative Partnership Funding scores for major capital schemes as part of the Leading Options in SMZ 3

ODU	Option	Capital scheme	PV cost (£k)	PV benefits (£k)	Indicative PF score	PV maximum eligible GiA (£k) for upfront costs	Minimum contribution / savings required for upfront costs (£k)
12	National: Improve A	Epoch 2	11,436	15,332	15%	1,454	8,235
13	Local: Improve A	Epoch 2	10,287	11,758	17%	1,537	7,435

6.5 SMZ 4 (Naish Cliff and Barton on Sea)

Selecting the leading options

6.5.1 Table 6-16 presents the benefit cost assessment for the ODU 14 within SMZ 4. The options have been ranked according to NPV because the options are focussed on managing coastal erosion risk. For erosion risk options it is not possible to rank the options according to flooding AEP and use the incremental AEP decision thresholds.

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Table 6-16: Benefit-cost assessment for SMZ 4 (NPV comparisons for ODU 14)

Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
ODU 14 – Naish Cliff and Barton on Sea						
Managed Realignment A	In epoch 1 upgrade and extend toe defences and cliff drainage to cover the full Barton on Sea frontage between Marine Drive West and Marine Drive East. Defences would be more robust against sea level rise and slow rate of erosion but not stop it.	22,211	23,489	1.06	1,278	Provisional Economic / National
Managed Realignment B	As per Managed Realignment A, except upgrades would not happen until epoch 2. Beach nourishment at Naish Cliff would be included with this option.	19,718	20,077	1.02	359	Backup
Managed Realignment D	As per Managed Realignment C, except defences would not be constructed at Marine Drive West and upgrades would not happen until epoch 2. Beach nourishment at Naish Cliff would be included with this option.	14,218	14,391	1.01	173	Backup
Maintain	Capital refurbishments of existing defences at the cliff toe and small-scale annual maintenance to the cliff drainage system.	5,927	5,959	1.01	32	Backup
Do Nothing	Baseline option. No active intervention.	-	-	-	-	
Managed Realignment C	In epoch 1 upgrade existing toe defences and cliff drainage to cover central and eastern parts of the Barton on Sea frontage, between Marine Drive and Marine Drive East. Marine Drive West would remain undefended. Upgraded defences would be more robust against sea level rise. Defended areas would have slower rate of erosion but it would still occur.	15,317	14,391	0.94	-926	
Do Minimum	Small scale maintenance but defences may fail in the future	1,228	286	0.23	-942	
Managed Realignment F	As per Managed Realignment E, except upgrades would not happen until epoch 2. Beach nourishment at Naish Cliff would be included with this option.	11,750	9,214	0.78	-2,536	
Managed Realignment E	In epoch 1 upgrade existing toe defences and cliff drainage to cover eastern parts of the Barton on Sea frontage at Marine Drive East. Marine Drive West would remain undefended and existing defences at Marine Drive would not be replaced. Defended areas would have slower rate of erosion but it would still occur.	11,836	9,214	0.78	-2,622	
Improve B	In epoch 1 upgrade and extend toe defences to cover the full length of the frontage (Naish Cliff to Marine Drive East). No beach nourishment.	46,061	27,275	0.59	-18,786	
Improve A	In epoch 1 refurbish and upgrade rock structures at cliff toe. Undertake large scale beach nourishment scheme to provide wide beach along full frontage length (Naish Cliff to Marine Drive East).	55,527	27,275	0.49	-28,252	

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ODU 14 – Naish Cliff and Barton on Sea

- 6.5.2 Managed Realignment A has the strongest economic case with the largest NPV and was therefore identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option. This option would defend the extent of the built-up area of Barton on Sea but would not defend Naish Cliff. The intervention would be undertaken in epoch 1 which increases confidence in a technically successful solution because more of the amenity open space at the top of the cliff would be retained, improving buildability, and enabling the design to be optimised.
- 6.5.3 No Local Aspirational Option was identified for this location. There is however a need for Backup Options as there are several uncertainties. Three Backup Options have been identified.
- 6.5.4 The first Backup Option is Managed Realignment B. This option is the same as Managed Realignment A, but the initial capital scheme (cliff drainage and toe protection) would be undertaken at the start of epoch 2 (rather than in the first part of epoch 1 with Managed Realignment A). This option has been identified as a Backup Option in case of a scenario in which not enough non-GiA funding could be secured during the first part of epoch 1 to implement Managed Realignment A, and more time is needed to secure all the funding contributions.
- 6.5.5 The second Backup Option is Managed Realignment D. Both Managed Realignment A and B include cliff drainage and toe defences at Marine Drive West, but the effectiveness of cliff drainage and toe defences here is uncertain due to this area being within the slump zone of Naish Cliffs. Managed Realignment D does not include defences at Marine Drive West and could be implemented as a Backup Option if further appraisal work during scheme development determines that defences at Marine Drive West are not likely to be effective.
- 6.5.6 The third Backup Option is Maintain. This has been identified in case the scheme costs for either Managed Realignment A, B or D increase, leading to the benefit cost ratios of these options falling below unity.

Sensitivity testing

- 6.5.7 Sensitivity tests have been undertaken on the option appraisal in SMZ 4. These are summarised below and further details can be found in Appendix F (Economics Report).

Option cost

- 6.5.8 Given the marginal ABCRs for the leading options in SMZ 4 a key uncertainty for the options relates to option cost. A sensitivity test that increases the National Option costs by 10% and 25% has been undertaken to determine whether the increase in cost would change the choice of the National Option. In summary, the results of the cost sensitivity tests and interpretation did not lead to changes in the choice of the National option:
- A rise in the Managed Realignment A costs by 10-25% would mean that Managed Realignment B would be selected as the provisional economic leading option. However, given the similarities between Managed Realignment A and B (they are the same option with different timings), any scenarios leading to a cost increase

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would impact both options in a similar way so there is no justification for selecting Managed Realignment B as the National Option due to this test.

- On balance Managed Realignment A is considered a less risky option than Managed Realignment B with greater buildability (owing to the earlier intervention and more space available at the top of the cliff).

Scheme timing and funding

6.5.9 It is recognised that there is a significant funding shortfall for capital schemes at Barton on Sea due to a lack of FCERM-GiA relative to option costs. Therefore an additional sensitivity test specific to the option funding has been undertaken, considering how the potential GiA funding availability may change if the capital scheme is delayed until year 50 or year 75 in the appraisal period. The test indicates that whilst the funding case would improve, there would still be a large funding shortfall at this time and therefore irrespective of when a capital scheme is delivered, significant amounts of non-GiA funding will be needed.

Details of the leading options

Technical aspects

- 6.5.10 The risk in SMZ 4 (ODU 14) is from coastal erosion and land sliding of the complex cliff system. The drivers of the erosion and land sliding are erosion of the cliff toe from wave action and rainfall / groundwater induced instability.
- 6.5.11 The National Option in SMZ 4 (ODU 4) is Managed Realignment A which involves refurbishing and upgrading existing rock toe defences and extending them to the west to cover Marine Drive West. In addition, new cliff drainage would be installed at Marine Drive and Marine Drive West. These upgrades would be undertaken during epoch 1 (estimated to be from year 10).
- 6.5.12 It is not possible to completely stop erosion of the cliff in this location due to the complex underlying geology. However, the National Option would significantly slow the rate of erosion relative to the Do Nothing scenario and would be expected to reduce (but not eliminate) the risk of erosion to over 470 properties over the Strategy appraisal period.
- 6.5.13 There is uncertainty as to how effective defences at Marine Drive West would be given that this part of the cliff is within the wider slump zone of Naish Cliff. It is the aspiration of the National Option to reduce the risk of erosion to the properties at Marine Drive West but this will require further detailed investigation during scheme development to determine if defences here can be effective.
- 6.5.14 As outlined in the Leading Option Report (Appendix C), whilst not included in the leading options at the Strategy stage, beach nourishment at Naish Cliff should be considered during scheme appraisal as there may be merit in placing material here. This requires further investigation and liaison with potential funding partners for this intervention.

Environmental aspects

- 6.5.15 The Strategy HRA Appropriate Assessment concluded that the National Option in SMZ 4 would not have any adverse effects on the qualifying features, and thus the integrity of the Solent and Dorset Coastal SPA (Marine Components GB).
- 6.5.16 The Strategy WFD assessment identified a range of potential impacts of the leading options on WFD objectives in SMZ 4 but identified suitable mitigation:

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- At the Strategy stage there is considerable uncertainty in defence alignments for the leading options in SMZ 4. Where possible during scheme design there is a commitment to minimise new defence footprints within European sites. This will help to minimise impacts on WFD objectives.
- Construction will need to consider seasonal working to avoid impacts on sensitive species and construction methodologies will need to be developed in line with the EA's Pollution Prevention guidance.

6.5.17 The Strategy SEA assessment concluded that the leading options in SMZ 4 are likely to have a major overall positive impact across the majority of the environmental categories. The Managed Realignment A option (National Option) is not expected to worsen the condition of the SSSI designation in this location relative to the baseline. Erosion would not be stopped entirely so continued exposure of geological features would be expected over time.

6.5.18 The MCZ assessment concluded that the leading options would have no significant risk to the conservation objectives of the Needles MCZ and Southbourne Rough MCZ.

6.5.19 There is potential for environmental enhancements and BNG as part of the Leading in SMZ 4; including opportunities for rock pool creation / intertidal habitat creation within defences that will be developed as part of the scheme implementation.

Costs of the leading options

6.5.20 Table 6-17 presents the present value costs of the leading options in SMZ 4. Costs are presented by capital costs and time epoch.

Table 6-17 Present Value Costs of Leading Options in SMZ 4

ODU	Option	Cost	Epoch 1 (2024- 2044) (£K)	Epoch 2 (2044- 2074) (£K)	Epoch 3 (2074- 2144) (£K)	Total (£K)
14	National Option: Managed Realignment A	Capital	18,503	0	1,820	20,323
		Non-Capital	780	749	360	1,889
		Total	19,283	749	2,179	22,211

Contributions and funding

6.5.21 Where possible indicative Partnership Funding scores have been calculated for the initial major capital schemes recommended by the leading options in the Strategy.

6.5.22 For the National Option in SMZ 4 the first major capital scheme is not outlined to occur until the future (estimated year 10). To work out indicative GiA availability the base date for the calculation has assumed a 'jump forward' in time to the time of the scheme.

6.5.23 Table 6-18 below presents the indicative funding score for the National Option. Note that the costs and benefits presented in this table are different to the values presented in the option appraisal due to a different base year and appraisal period duration.

6.5.24 As can be seen, the funding score is 12% and therefore significant non-GiA funding is expected to be required to deliver the Strategy leading option. NFDC as an outcome of the Strategy have committed to developing a funding and implementation plan for the Strategy which will identify where funding will be obtained.

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6.5.25 Backup Options have been identified for this area for various reasons. The Managed Realignment B Backup Option would provide more time to secure the non-GiA funding required to progress the scheme. The Maintain Backup Option would reduce the capital funding requirements as there are no major capital upgrade schemes with this option. This would be more deliverable but would not deliver the same level of benefits and there would be increased uncertainty.

Table 6-18: Indicative Partnership Funding scores for major capital schemes as part of the Leading Options in SMZ 4

ODU	Option	Capital scheme	PV cost (£k)	PV benefits (£k)	Indicative PF score	PV maximum eligible GiA (£k) for upfront costs	Minimum contribution / savings required for upfront costs (£k)
14	National: Managed Realignment A	Epoch 1	30,525	30,710	12%	3,215	22,886

6.6 SMZ 5 (Taddiford)

Selecting the leading options

ODU 15 –Barton on Sea to Hordle Cliff

- 6.6.1 In Table 6-19 the short list options have been ranked according to NPV because the options are focussed on managing coastal erosion risk. For erosion risk options it is not possible to rank the options according to flooding AEP and use the incremental AEP decision thresholds.
- 6.6.2 Do Nothing has the strongest economic case because it does not have a negative NPV and was therefore identified as the provisional economic leading option. There is no economic, technical, environmental or social justification for FCERM interventions in ODU 15 and therefore Do Nothing was retained and identified as the National Option.

Sensitivity testing

- 6.6.3 No sensitivity tests were undertaken in SMZ 5 because Do Nothing is the National Option and there is no justification to intervene.

Details of the leading options

- 6.6.4 There are no specific technical or environmental aspects to consider for the Do Nothing option in this location
- 6.6.5 There is no cost or funding associated with the Do Nothing Option. There may be some costs associated with moving the cliff top footpath inland and ensuring health and safety compliance but these costs are not attributable to FCERM.
- 6.6.6 Erosion of the cliff line in SMZ 5 would be expected to continue which will provide a feed of material to the beach.

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Table 6-19: Benefit-cost assessment for SMZ 5 (NPV comparisons for ODU 15)

Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
ODU 15 –Barton on Sea to Hordle Cliff						
Do Nothing	Baseline option. No active intervention	-	-	-	-	Provisional economic / National
Do Minimum	Health and safety compliance only	44	-	-	-44	
Managed Realignment	Maintain beach levels through beach recycling	110	-	-	-110	

6.7 SMZ 6 (Milford on Sea)

Selecting the leading options

6.7.1 Table 6-20 presents the benefit cost assessment for the ODUs within SMZ 6. The options have been ranked according to NPV because the options are primarily focussed on managing coastal erosion risk. For erosion risk options it is not possible to rank the options according to flooding AEP and use the incremental AEP decision thresholds.

ODU 16 – Cliff Road

6.7.2 Managed Realignment C has the strongest economic case with the largest NPV and was therefore identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option. However, this option does not include the beach nourishment and strong point scheme until the mid-point of epoch 2 which could lead to increased uncertainty before this point in time as the beach level response to sea level rise is difficult to predict. If additional erosion were to occur then it could make it more technically challenging to implement a strong point / beach nourishment scheme in the future.

6.7.3 Managed Realignment A and B have therefore been selected as Local Aspirational Options as this would bring forward the intervention in time and reduce this uncertainty. It is the aspiration to do a scheme here sooner rather than later so having these options as aspirational options on the adaptive pathways will facilitate this. The additional expenditure required for the Local Aspirational Option would need to come from non-GiA sources. Wider local benefits that are not presented in the economic comparison in Table 6-20 could be considered to help justify the additional expenditure. The economic appraisal has identified up to £26million of local damages that could be partially avoided by the National or Local Options. Approximately £4million of this damage is related to beach hut income and intervening sooner would likely help retain more of this income.

6.7.4 The Maintain option has been identified as a Backup Option in case funding for the Managed Realignment options cannot be secured.

ODU 17 – Rook Cliff

6.7.5 Improve C has the strongest economic case with the largest NPV and was therefore identified as the provisional economic leading option. After considering uncertainty and sensitivity tests, this option was retained and was identified as the National Option. However, this option does not include the upgrading the defences until the mid-point of epoch 2 which could lead to increased uncertainty before this point as there will be a reliance on ageing defences.

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Table 6-20: Benefit-cost assessment for SMZ 6 (NPV comparisons for ODU 16-18)

Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
ODU 16 – Cliff Road						
Managed Realignment C	As Managed Realignment A except beach nourishment and strong point construction at mid-point of epoch 2	4,405	7,400	1.68	2,995	Provisional Economic / National
Managed Realignment B	As Managed Realignment A except beach nourishment and strong point construction at start of epoch 2	5,069	7,400	1.46	2,331	Local
Managed Realignment A	In epoch 1 undertake beach nourishment and construct local strong point to control (but not stop) further erosion and coastline position.	5,612	7,400	1.32	1,788	Local
Maintain	Capital refurbishments to existing defences in the east part of the unit (most of the unit is undefended) and regular small scale beach nourishment to provide some protection to the cliff toe	1,791	3,017	1.68	1,226	Backup
Do Nothing	Baseline option. No active intervention	-	-	-	-	
Do Minimum	Small scale maintenance but defences may fail in the future	469	0	-	-469	
Improve	In epoch 1 construct new hard defence along length of unit to prevent erosion of the cliff toe and minimise further cliff erosion	7,954	7,415	0.93	-539	
ODU 17 – Rook Cliff						
Improve C	As Improve A except upgrade undertaken at mid-point of epoch 2.	9,055	11,516	1.27	2,461	Provisional Economic / National
Improve B	As Improve A except upgrade undertaken at start of epoch 2.	9,376	11,516	1.23	2,140	Local
Maintain	Capital refurbishments to existing defences	4,110	4,222	1.03	112	Backup
Improve A	In epoch 1 upgrade existing cliff toe defences to make more robust against sea level rise	11,471	11,516	1.00	45	Local
Do Nothing	Baseline option. No active intervention	-	-			
Do Minimum	Small scale maintenance but defences may fail in the future	241	0	-	-241	
Managed Realignment A	In epoch 1 retain strong points but remove defences between Rook Cliff and the White House to realign shoreline landwards. Beach nourishment and rock groynes to hold new shoreline in place.	14,021	10,092	0.72	-3,929	

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Option	Description	PV Costs (£k)	PV Benefits (£k)	ABCR	NPV (£k)	Leading Option(s)
Managed Realignment B	In epoch 1 construct nearshore breakwaters and undertake beach nourishment to realign shoreline seawards and promote beach growth	17,269	11,516	0.67	-5,753	
ODU 18 – Milford on Sea						
Improve B	As per Improve A except upgrade the open coast defences and undertake beach nourishment in epoch 2. Refurbish defences in epoch 1 to extend service life. Timing of setback defence construction unchanged and occurs in epoch 2.	11,035	11,155	1.01	120	Provisional Economic / Backup
Improve A	In epoch 1 upgrade open coast defences and undertake large scale beach nourishment and construction of new groynes. Construct setback defences to reduce tidal flood risk from Sturt Pond in epoch 2.	11,060	11,155	1.01	95	Provisional Economic / National
Maintain	Capital refurbishments to existing defences and regular small scale beach nourishment	8,872	8,933	1.01	61	Backup
Do Nothing	Baseline option. No active intervention	-	-	-	-	
Do Minimum	Small scale maintenance but defences may fail in the future	963	83	0.09	-880	
Managed Realignment B	In epoch 1 construct nearshore breakwaters and undertake beach nourishment to realign shoreline seawards and promote beach growth	12,269	11,155	0.91	-1,114	
Managed Realignment A	In epoch 1 retain strong points at White House and Hurst Spit revetment but realign the shoreline landwards between these points. Beach nourishment to help control rates of erosion and shoreline evolution.	11,999	7,618	0.63	-4,381	

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- 6.7.6 Improve A and B have therefore been selected as Local Aspirational Options as this would bring forward the intervention in time and reduce this uncertainty. It is the aspiration to do a scheme here sooner rather than later so having these options as aspirational options on the adaptive pathways will facilitate this. The additional expenditure required for the Local Aspirational Option would need to come from non-GiA sources. Wider local benefits that are not presented in the economic comparison in Table 6-20 could be considered to help secure funding from non-GiA sources.
- 6.7.7 The Maintain option has been identified as a Backup Option in case funding for the Improve options cannot be secured.

ODU 18 – Milford on Sea

- 6.7.8 Improve A and B have very similar NPVs and therefore both were identified as the provisional economic leading options. Both options are similar, but Improve A involves intervening sooner with defence upgrades and beach nourishment (in epoch 1, rather than epoch 2).
- 6.7.9 Currently the defences in ODU 18 are in a poor condition and threatened by lowering beach levels. NFDC need to frequently top up beach levels to ensure there is enough material to protect the defence toe and reduce the risk of failure. As such, with the earlier capital scheme, Improve A provides significantly more certainty to the success of the option. By shortening the time until the capital scheme is undertaken, the existing assets will not need to be relied upon for as long leading to a reduced risk of defence failure before the scheme is implemented. Furthermore, should beach nourishment costs reduce (see sensitivity test), the economic case of Improve A improves relative to Improve B.
- 6.7.10 After considering uncertainty and sensitivity tests, Improve A was identified as the National Option.
- 6.7.11 Improve B was retained as a Backup Option in case funding for the defence improvements and beach nourishment could not be secured in epoch 1. Maintain was also identified as a Backup Option in case funding for either Improve options could not be secured.
- 6.7.12 Lowering beach levels are a key concern in this location and there remains uncertainty as to which defence measures are most likely to be effective in this location. Further work and numerical modelling is required during business case development to reconsider the potential defences measures in more detail.
- 6.7.13 The Improve A and B options include rock groynes and a beach nourishment scheme and the purpose of these measures is to retain a larger beach volume in this location to defend the toe of the defences, whilst providing an added benefit of an amenity and recreation resource. However, the coastal processes are complex here and there is uncertainty as to how successful this approach will be, particularly as there would be no room for the beach to move inland over time with sea level rise.
- 6.7.14 Managed Realignment B included nearshore breakwaters with the aim of transitioning the shoreline seaward, but the estimated cost of this approach at the strategy stage is prohibitive. However during business case development more details and site specific analysis can be undertaken and this may result in the cost of breakwaters coming down, potentially making breakwaters a feasible measure. Breakwaters could have advantages in terms of retaining beach material relative to groynes (due to the fixed seawall position

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and the restriction this imposes on future beach position), but numerical modelling is required to investigate this and confirm the outcome during further appraisal work.

Sensitivity testing

6.7.15 A range of sensitivity tests have been undertaken on the option appraisal in SMZ 6. These are summarised below and further details can be found in the Economic Appraisal Report (Appendix F).

Option cost

6.7.16 A key uncertainty for the options in SMZ 6 relates to option cost. Sensitivity tests that increase the National Options costs by 10% and 25% have been undertaken to determine whether the increase in cost would change the choice of the National Options. In summary, the results of the cost sensitivity tests and interpretation did not lead to changes in the choice of the National Option in any of the ODUs.

6.7.17 In each ODU a rise in cost of the National Option would result in an alternative having a stronger economic case and being identified as the provisional economic leading option. However, in each case the alternative that would be identified is similar to the National Option in terms of the package of measures, with the only difference being in implementation timing. Therefore in a scenario whereby costs for the National Option increase, similar cost increases would be expected for the alternative options too. Changing the choice of National Option on this basis is not justified.

Cost of beach nourishment

6.7.18 A high proportion of the costs of the leading options in ODUs 16 and 18 are associated with beach nourishment. The beach nourishment cost applied in the economic appraisal was approximately £33 per m³ of material which is considered a reasonably, mid-level estimate of nourishment costs at the Strategy level. However, there could be potential to reduce this cost if local sources of material are used, or if material with different characteristics (i.e. coarser) is used.

6.7.19 A sensitivity test has been undertaken to determine whether a 50% lower beach nourishment cost changes the choice of the National Option. In summary, the choice of National Option in ODUs 16 and 18 would remain unchanged with a 50% lower beach nourishment cost and therefore there is no justification to change the National Option on this basis.

Details of the leading options

Technical aspects

6.7.20 The main risk in SMZ 6 is from coastal erosion. Erosion would occur if existing defences were not refurbished and left to fail. Lowering beach levels at Milford on Sea have increased the vulnerability of the ageing defences in this location, resulting in seawall failures in 2008 & 2020.

6.7.21 There is also a risk from flooding in ODU 18 within SMZ 6. The risk is from two directions; wave overtopping from the open coast / beach frontage and still water level tidal flooding from Sturt Pond.

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- 6.7.22 The National Options in SMZ 6 manage these key risks facing the frontage by recommending a series of defence upgrades and beach nourishment schemes to improve beach levels.
- 6.7.23 In ODU 16 the National Option of Managed Realignment would transition the coastline to a more sustainable position over time, aiming to prevent erosion of the roadway and properties by constructing a local strong point and increasing beach levels through nourishment. In ODU 17 existing defences at the toe of Rook Cliff would be upgraded to ensure they are more robust against sea level rise and can continue to perform their erosion defence function in the future. In ODU 18 the seawall would be upgraded (including raising to reduce overtopping risk), a major beach nourishment scheme would be undertaken to improve beach levels and new groynes constructed to help retain this material. Setback flood defences would also be constructed to reduce the risk of tidal flooding from Sturt Pond.
- 6.7.24 The Local Options in ODUs 16-18 are largely the same as the National Options but bring forward in time the initial interventions to provide more certainty in the short and medium term.
- 6.7.25 The National and Local Options aim to use beach nourishment and new beach control structures (groynes) to improve beach levels in this location. It is recommended that numerical modelling is undertaken during scheme appraisal to determine the most appropriate beach material gradings and groyne layout. As outlined in the option selection discussion previously, alternative types of control structures such as fishtail groynes or nearshore breakwaters may also be of merit in this location and should be considered during business case development.
- 6.7.26 A full schedule of proposed works as part of the leading options is provided in the Economics Appraisal Report (Appendix F). As these are primarily erosion defences in SMZ 6, an indicative SoP for the defences has not been determined. Defence heights will need to be established during business case development, considering aspects such as wave run-up and overtopping, groyne layout, rock sizing, and volume of beach nourishment required.

Environmental aspects

- 6.7.27 The conclusions and suggested mitigations of the Strategy HRA Appropriate Assessment for the leading options in SMZ 6 are summarised in Table 6-21 below.

Table 6-21: Summary of HRA Appropriate Assessment for SMZ 6

European site	Recommendations / Mitigation
Solent and Southampton Water SPA	ODUs 16, 17 & 18 – project level HRA recommended to help inform defence alignments. Due to the proximity to the designation there is potential for habitat loss / damage and disturbance (noise, visual). There are opportunities to choose alignments that avoid the impact and undertake construction mitigation but more detailed appraisal is required at scheme stage and project level HRA should support this.
Solent Maritime SAC	ODU 18 – project level HRA recommended to help inform defence alignments. Due to the proximity to the designation there is potential for habitat loss. There are opportunities to choose alignments that avoid the impact and undertake construction mitigation but more detailed appraisal is required at scheme stage and project level HRA should support this.

- 6.7.28 The Strategy WFD assessment identified a range of potential impacts of the leading options on WFD objectives in SMZ 6 but identified suitable mitigation:

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- At the Strategy stage there is considerable uncertainty in defence alignments for the leading options in SMZ 6 but there is a commitment to minimising encroachment into designated sites where possible during scheme design (see HRA summary table above for more details).
- Construction will need to consider seasonal working to avoid impacts on sensitive species and construction methodologies will need to be developed in line with the EA's Pollution Prevention guidance.

6.7.29 The Strategy SEA assessment concluded that the leading options in SMZ 6 are likely to have an overall positive impact across most of the environmental categories.

6.7.30 The MCZ assessment concluded that the leading options would have no significant risk to the conservation objectives of the Needles MCZ and Southbourne Rough MCZ.

6.7.31 There is potential for ecological enhancements and BNG as part of the leading options in SMZ 6 including opportunities for creating intertidal habitats such as rockpools and 'living' seawalls. These opportunities will be explored further during scheme design.

Costs of the leading options

6.7.32 Table 6-22 presents the present value costs of the leading options in SMZ 6. Costs are presented by capital costs and time epoch. Note that for ODUs 16 and 17 the Managed Realignment A and Improve A options are shown as these have the highest PV cost (Managed Realignment B and Improve B are also Local Options here).

Table 6-22 Present Value Costs of Leading Options in SMZ 6

ODU	Option	Cost	Epoch 1 (2024-2044) (£K)	Epoch 2 (2044-2074) (£K)	Epoch 3 (2074-2144) (£K)	Total (£K)
16	Local: Managed Realignment A	Capital	3,808	597	424	4,829
		Non-Capital	368	270	146	784
		Total	4,176	866	571	5,612
17	Local: Improve A	Capital	10,709	0	464	11,174
		Non-Capital	147	98	53	298
		Total	10,856	98	517	11,472
18	National: Improve A	Capital	8,060	1,249	470	9,779
		Non-Capital	918	170	192	1,280
		Total	8,978	1,419	662	11,060

Contributions and funding

6.7.33 Where possible indicative Partnership Funding scores have been calculated for the initial major capital schemes recommended by the leading options in the Strategy.

6.7.34 For the majority of the leading options in SMZ 6, the first major capital scheme is not outlined to occur until the future (at the earliest mid-way through epoch 1). To work out indicative GiA availability the base date for the calculation has assumed a 'jump forward' in time to the time of the scheme.

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6.7.35 Table 6-23 below presents the indicative funding scores. In ODUs where a Local Aspirational Option has been identified, the funding score for this option is shown. In ODUs where no Local Aspirational Option has been identified, the score for the National Option is shown. The funding scores for all the leading options are shown in the Economic Appraisal Report (Appendix F). *Note that the costs and benefits presented in this table are different to the values presented in the option appraisal due to a different base year and appraisal period duration.*

6.7.36 As can be seen, the funding scores range between 12-29% and therefore significant non-GiA funding is expected to be required to deliver the Strategy leading options. NFDC as an outcome of the Strategy have committed to developing a funding and implementation plan for the Strategy which will identify where funding will be obtained.

6.7.37 Backup Options have been identified for each ODU that do not involve capital defence upgrade schemes or large scale beach nourishment. These Backup Options would be more deliverable but would not be expected to provide the same levels of benefit and the residual risk of defence failure / erosion would remain elevated.

Table 6-23: Indicative Partnership Funding scores for major capital schemes as part of the Leading Options in SMZ 6

ODU	Option	Capital scheme	PV cost (£k)	PV benefits (£k)	Indicative PF score	PV maximum eligible GiA (£k) for upfront costs	Minimum contribution / savings required for upfront costs (£k)
16	Local: Managed Realignment A	Epoch 1 mid	6,533	8,957	29%	1,301	3,221
17	Local: Improve A	Epoch 1 mid	14,458	14,826	18%	2,400	11,225
18	National: Improve A	Epoch 1 mid	12,420	13,999	12%	1,355	9,552

Other aspects / interaction with Hurst Spit

6.7.38 The leading options in SMZ 6 include beach nourishment in ODUs 16 and 18 which will help to increase the volume of beach material within the bay. This will support the long term management of Hurst Spit because the dominant longshore transport direction is from west to east and therefore a proportion of the material placed in SMZ 6 would be expected to feed Hurst Spit over time. There would also be benefit from the nourishment in other parts of the bay, such as SMZ 3 (Christchurch Beaches and Cliffs) as some of this beach material placed further west may also be expected to move through to Hurst Spit gradually over time as part of a bay wide approach to managing the beaches.

6.7.39 At the time of writing there is some uncertainty around the final leading options for Hurst Spit, to be identified as part of the Hurst Spit to Lymington Strategy:

- It is currently unclear what the leading options may be with a range of options still being considered, including medium term controlled rollback of the spit. However, through collaboration with the Hurst Spit to Lymington Strategy team it has been agreed that the rock revetment strong point at the base of the spit will be held in place over the next century. This will secure the position of the shoreline immediately to the east of SMZ 6 and create a stable transition point between SMZ 6 and Hurst Spit.

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- If controlled rollback of Hurst spit is the leading option for the Hurst Spit to Lymington Strategy, it will be important to fully understand the coastal processes implications of the rollback and to manage the rollback accordingly. It is important that any rollback does not threaten the rock revetment transition point between the two Strategies or have negative unforeseen coastal process impacts across the wider area which cannot be planned for. This may require studies to understand how changes to the spit alignment could impact coastal processes on the beaches and offshore banks in the area and the sediment transport linkages between the two.
- With the Hurst Spit to Lymington Strategy still ongoing, there is also some uncertainty around when a decision on the leading option for the spit will be made. In the interim whilst the Hurst Spit to Lymington Strategy is completed, the spit will continue to be managed in line with the BMP / SMP policies (i.e. keep maintaining the spit until the long term direction is finalised). The leading options in SMZ 6 will support both the short term management of the spit until the Strategy is finalised (i.e. continuing the status quo) and also a longer term approach once it is decided upon.

6.7.40 When implementing the Strategy leading options and developing the beach nourishment and defence schemes in ODUs 16 and 18, it is recommended that the design considers potential synergies to support the management of the spit. For example, the beach nourishment / scheme design could consider ‘overfilling’ groyne bays in SMZ 6 to encourage additional movement of material to the east if this would support the long term plan and evolution of the spit.

6.8 Summary of strategy

6.8.1 A summary of the Strategy leading options is provided below.

6.8.2 The leading options are adaptable to future changes in risks, community aspirations and funding availability. Generally, each option includes a series of interventions through (in three epochs) that can be brought forward or delayed as required. In addition, up to three leading options have been identified in each ODU, providing the FCERM delivery team with suitable flexibility to change course between options as required based on new information / funding that may become available over the course of the Strategy implementation.

6.8.3 In ODUs 1 and 2 it is important to sustain the FCERM function of the Mudeford Sandbank as uncontrolled erosion / movement of Mudeford Sandbank could have uncertain impacts on the wider morphology of the area, potentially impacting flood risk, navigation, sediment transport and buried services in the vicinity. The Local Aspirational Options for this location are focussed on maintaining the existing FCERM function of the Sandbank over the course of the appraisal period. On a national basis there is not a strong economic case to deliver the Local Aspirational Options in ODUs 1-2, but it is important for these to be delivered to ensure the leading options in ODUs 3-10 are successful.

6.8.4 In ODUs 3-10 the main risk is from tidal flooding to properties and other assets. Where there is an economic case, the leading options are generally focussed on upgrading the SoP provided by defences in these locations. This could be achieved by raising existing defences or constructing new defences as required. Different timings are recommended for defence upgrades based on a range of factors such as the onset of risk and the residual life of existing defences. Another risk in ODUs 3-10 is historic landfill sites and the potentially contaminated materials that could be exposed should these locations be undefended and erode. The different approaches to managing this risk (with respect to

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timings and cost) have been explored in the appraisal and are picked up in the leading options.

- 6.8.5 In ODU 11 it is important to sustain the FCERM function of the existing quay walls as erosion / damage to the quay could lead to more widespread morphological changes and impact flood risk elsewhere in the area. The Local Aspirational Option in this location aims to prevent the quay from eroding and provides property level protection to the properties on the quay at risk from flooding. Similar to ODUs 1 and 2, on a national basis there is not a strong economic case to sustain the function of the quay walls in ODU 11, but it is important for the function of these assets to be continued to ensure the leading options in ODUs 3-10 and ODU 12 can be delivered successfully.
- 6.8.6 In ODUs 12-18, along this open coast part of the Strategy frontage the leading options are underpinned by a series of strategically placed beach nourishment interventions over time. The placement locations have been identified to provide an immediate benefit to the placement location but also to provide a long term benefit to areas downdrift over the Strategy period, including Hurst Spit. The leading options recommend beach nourishment is undertaken in ODU 12, ODU 13, ODU 16 and ODU 18 at various points over the next 100 years. There is an opportunity to explore a joined-up approach to scheme delivery in these locations which could deliver efficiencies and cost-savings that could make the economic case more affordable than currently identified. If a combined source of material could be secured for all or many of the areas, the adaptive pathways between the leading options in the Strategy provides the flexibility in timings of interventions to deliver nourishment schemes for each location simultaneously rather than treating each location individually. The beach nourishment will ensure that the beach can continue to provide an integral part of the overall defence system along the open coast. However, in some locations it would need to be supplemented with additional hard defence structures and cliff slope stabilisation. For example in ODU 14 at Barton on Sea new cliff toe defences and cliff slope drainage is recommended.
- 6.8.7 For each of the leading options (National and/or Local Aspirational), the partnership funding score for their initial schemes is typically less than 50%. This indicates that significant funding contributions from non-GiA sources will need to be found to deliver the Strategy and its recommendations. Typically the initial schemes are not recommended to occur for several years at least (with many recommended to occur even later during epoch 2 / 3). This provides the BCP / NFDC FCERM teams with time to source funding contributions and one of the recommendations following the Strategy is to develop a funding action plan to plan, identify and secure contributions before schemes are required.
- 6.8.8 In some ODUs the average benefit cost ratio of the leading options is less than unity. However, this is on a national basis only (i.e. only considering nationally eligible benefits). As part of the Strategy, the wider local impacts of flooding and erosion in each ODU have also been calculated and when these damages (and potential benefits) are considered, this results in a much stronger economic case of the options on a local economic basis.
- 6.8.9 The Strategic links between ODUs have been considered and a sensitivity analysis undertaken to assess the impact of following different adaptive pathways or types of leading option in adjacent units. A full description of this test can be found in the Leading Options report (Appendix C). In summary, if either of the National, Local or Backup Options are delivered in an ODU then this would not be expected to impact the success of options in adjacent units. The main exceptions to this are:

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- ODUs 1, 2 and 11 where it is important that the Local Aspirational Options are delivered to prevent widespread morphological changes to the harbour and harbour entrance.
- In SMZ 6 (Milford on Sea) where there is a clear link between ODUs 16-18 and a reliance on the delivery of one of the leading options in each unit to ensure a cohesive approach. To help manage this uncertainty it is recommended that schemes in ODU 16-18 are delivered concurrently where possible to provide more certainty in the approach and outcomes delivered.

6.8.10 Table 6-24 presents details of the Strategy, including the present value and cash costs, present value benefits and benefit cost ratio. All benefits presented in this table are nationally eligible benefits. Where ODUs have a Local Aspirational Option then this has been presented. Otherwise the National Option is presented.

6.8.11 Table 6-25 presents an estimate of the local economic damages in each ODU from flooding and erosion under the Do Nothing scenario. A significant proportion of these damages would be avoided by implementing the leading options, thus strengthening the economic case of the options on a local basis. The impacts relate to tourism, car park income, beach hut income, health and wellbeing and gross value added (GVA) business impacts. Note that these local impacts are not eligible to be included in a business case on a national basis but can support local decision making and acquiring non-GiA partnership funding. Note that there is some uncertainty in the local economic impact values and it has been necessary to make a range of assumptions. More work is required during scheme level appraisal to refine the values. For more details on the local economic impacts refer to the Strategy Economics Report (Appendix F).

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Table 6-24 Summary of strategy

	SMZ 1		SMZ 2								SMZ 3		SMZ 4	SMZ 5	SMZ 6			Total
	ODU 1	ODU 2	ODU 3	ODU 4	ODU 5	ODU 6	ODU 7	ODU 9	ODU 10	ODU 11	ODU 12	ODU 13	ODU 14	ODU 15	ODU 16	ODU 17	ODU 18	Total
Option*	L	L	L	L	L	N	N	N	N	L	L	L	N	N	L	L	L	
PV Costs (£k)																		
Capital	2,545	5,243	660	3,294	20,772	2,734	4,016	10,756	8,236	9,462	13,712	6,325	20,323	0	4,829	11,147	9,779	133,833
Non-capital	278	213	116	204	136	68	103	204	136	68	318	363	1,889	0	784	298	1,280	6,458
Total PV Costs (£k)	2,823	5,456	776	3,499	20,908	2,802	4,118	10,960	8,373	9,530	14,030	6,689	22,211	0	5,612	11,472	11,060	140,319
PV Benefits (£k)**	0	89	811	3,638	36,532	2,877	5,329	37,809	11,124	680	8,978	6,946	23,489	0	7,400	11,516	11,155	168,373
Average Benefit/Cost Ratio	0.00	0.02	1.05	1.04	1.75	1.03	1.29	3.45	1.33	0.07	0.64	1.04	1.06	0.00	1.32	1.00	1.01	1.20
Cash Costs (£k)																		
Capital	8,232	19,076	2,135	10,953	24,268	8,283	7,991	25,312	30,570	30,463	24,429	17,230	38,497	0	9,546	16,354	18,182	291,521
Non-capital	943	728	434	685	457	228	411	685	457	228	1185	1,199	6,848	0	2,697	1,000	3,503	21,688
Total Cash Costs (£k)	9,175	19,804	2,569	11,638	24,725	8,511	8,402	25,997	31,027	30,691	25,614	18,429	45,345	0	12,243	17,354	21,685	313,209

*National Option denoted by "N". Local Option denoted by "L"

**Only nationally eligible benefits are included (i.e. eligible to be included in FCERM-AG decision criteria and FCERM-GiA funding applications).

Table 6-25 Local Economic Impacts

	SMZ 1		SMZ 2								SMZ 3		SMZ 4	SMZ 5	SMZ 6			Total
	ODU 1	ODU 2	ODU 3	ODU 4	ODU 5	ODU 6	ODU 7	ODU 9	ODU 10	ODU 11	ODU 12	ODU 13	ODU 14	ODU 15	ODU 16	ODU 17	ODU 18	Total
Option	L	L	L	L	L	N	N	N	N	L	L	L	N	N	L	L	L	
Total PV Costs (£k)	2,823	5,456	776	3,499	20,908	2,802	4,118	10,960	8,373	9,530	14,030	6,689	22,211	0	5,612	11,472	11,060	140,319
PV Do Nothing local economic damages that could be avoided with Leading Option*	7,754	13,989	6,414	5,955	12,118	6,548	7,974	15,466	7,292	14,559	79,974	35,674	54,327	7,619	26,228	13,838	22,857	338,586

*Local impacts are in addition to the national eligible benefits outlined in Table 6-24

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7 Implementation

7.1 Project planning

Phasing and Approach

7.1.1 The Strategy promotes and supports long term, sustainable adaptive management of the coastal flooding and erosion risks in Christchurch Bay and Harbour. The Strategy has set out the leading options for each ODU. In order to implement these options a series of phased capital interventions and scheduled maintenance is required. This work needs to be planned ahead of time through the development of business cases. Ongoing engagement with stakeholders and communities will be required to manage the risks and consequences of flooding and erosion and to build support for FCERM interventions.

Adaptive Pathways

7.1.2 As outlined in Section 4.1, the Strategy has been developed to provide adaptive capacity in the future so that there is the flexibility to make changes to the approach in response to key uncertainties such as climate change, funding, land use and development.

7.1.3 The identification of up to three types of leading Option in each ODU (National, Local Aspirational and Backup Options) has been integral to this approach. This provides the FCERM teams implementing the Strategy with flexibility to set out on different pathways and then to move between the option pathways over time.

7.1.4 In ODUs where Local Aspirational Options have been identified, the starting pathway will be this option. In other areas the starting pathway will be the National Option. As uncertainties are reduced or amended over time, the FCERM teams can switch to deliver different leading options (moving pathways to a new option) or choose to stay with the original option (staying on the original pathway). For example, funding is recognised as a key uncertainty. In the short term if funding is not available for a particular location with a Local Aspirational Option, the pathway may be switched to deliver either the National or Backup Options instead. However, if in the future there is success in acquiring additional funding from different sources or there could be potential changes to funding rules and more funding becomes available, then the pathway could switch back to delivering the Local Aspirational Option at that point in time.

7.1.5 The Strategy leading options have been developed to allow the switching between options / pathways without comprising the approach in adjacent areas. Figure 7-1 presents an illustration of the adaptive pathway approach. It shows hypothetical options within an ODU. The epoch by epoch breakdown of the National, Local Aspirational and Backup Options are shown as well as the different adaptive pathways that could be taken through the various options. Decisions on which route to take would be subject to changing risks, opportunities and funding availability.

7.1.6 In the figure, the solid arrows are the anticipated route through each option at the start of the Strategy implementation period. However, there are two dotted arrows shown on the figure, illustrating two different examples of how the FCERM delivery team could change course between options as risks change or more funding became available:

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- the purple dashed line illustrates one pathway that could occur. In this hypothetical example, initially, at the start of the delivery period the back-up option was implemented as there was insufficient funding to deliver the National Option or Local Aspirational Leading Option. However, in epoch 2 the funding rules are altered and more funding becomes available meaning that it is viable to construct a new defence, as planned as part of the Local Aspirational Leading Option. Therefore, there is a change in the pathway and the new defence is delivered.
- the red dashed line illustrates another potential pathway that could occur. In this example a decision may be made initially to start with the National Leading Option with funding committed to future FCERM schemes. This option involves constructing upgraded defences in epoch 3 as flood risk is not expected to impact a significant number of properties until then. However, over the course of epoch 1, new sea level rise guidance and updated modelling becomes available which suggests that flood risk is much more significant than original expectations and many more properties are at risk earlier. Therefore, a shift in approach is required and funding is secured through partnership working to undertake the new defence upgrade sooner and deliver the Local Aspirational Leading Option.

7.1.7 Adaptive pathway illustrations similar to Figure 7-1 have been developed for each of the ODU's in the Strategy. These are presented in Appendix E.

7.1.8 As part of the Strategy an action and implementation plan has been developed and is presented in Appendix G. This plan includes details of the triggers and thresholds to inform key FCERM decisions and movement through the adaptive pathways in each ODU.

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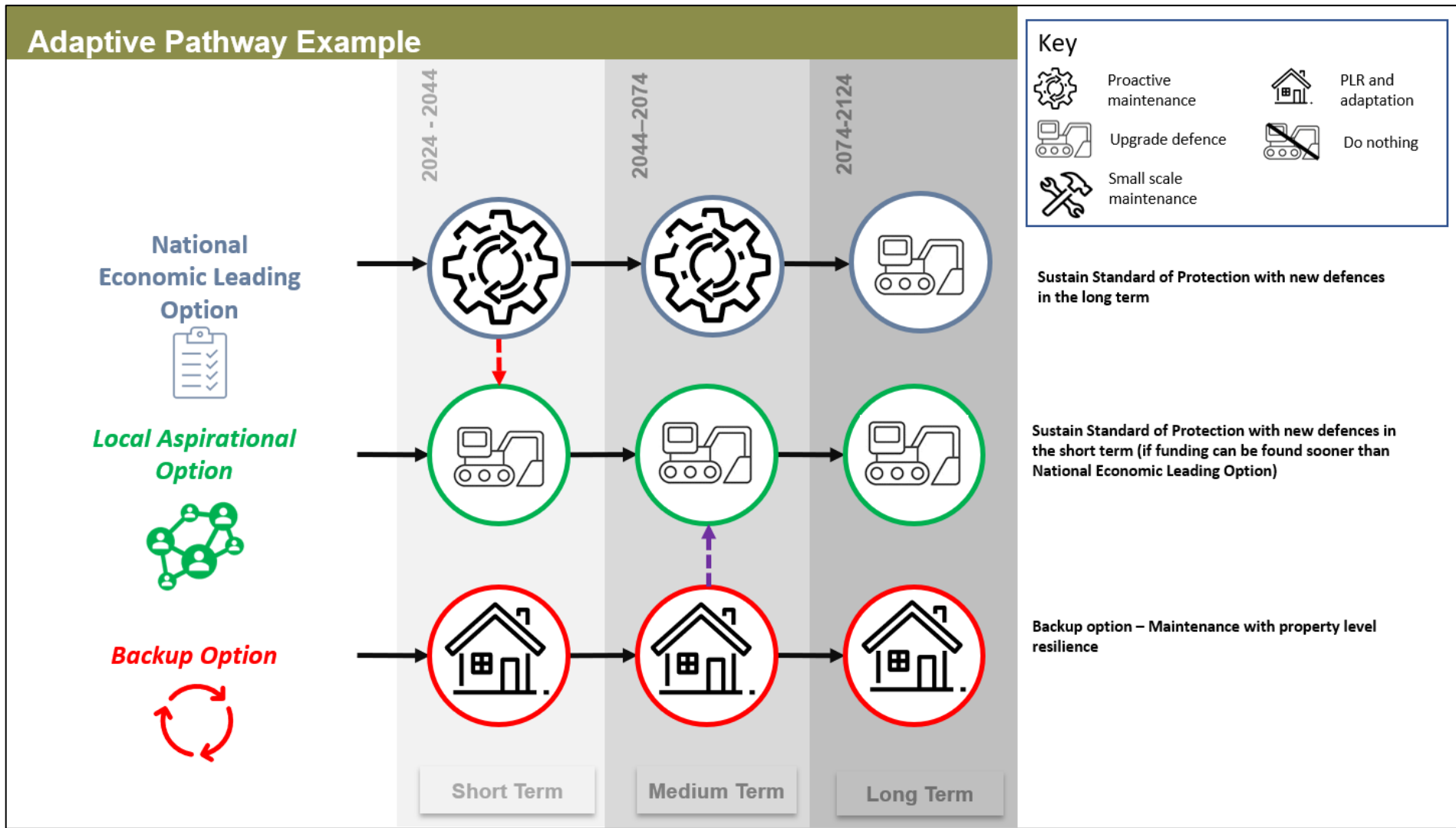


Figure 7-1: Adaptive Pathway illustration

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Programme and spend profile

- 7.1.9 The Strategy proposes a 100-year schedule of phased capital investments and maintenance to reduce the risks of coastal flooding and erosion for up to three leading options in each ODU.
- 7.1.10 The programme and spend profile for the Strategy will vary depending on which adaptive pathways are implemented. However, for the purposes of this section, the programme of works and spend profiles outlined below assume that the Local Aspirational Option is delivered in ODUs where one has been identified. In other ODUs where there is not a Local Aspirational Option identified it has been assumed that the National Option will be delivered.
- 7.1.11 Table 7-1 shows the programme of works by ODU and time epoch. The programme shows capital defence construction and upgrades, capital refurbishment and beach management activities. Ongoing small scale patch repairs and small scale beach recycling / management are not shown in the table but would be required and have been included for each do something option in the option costing. Full details can be found in the Leading Options Report (Appendix C).
- 7.1.12 Table 7-2 shows the indicative key dates for defence upgrades / beach nourishment schemes recommended by the leading options during epoch 1. The timelines are based on either delivering the Local Aspirational Option (if there is one identified in an ODU) or the National Option. The timings do not account for the different adaptive pathways that could be taken through the options and therefore would be subject to change as the Strategy is delivered. The timings are also subject to acquiring the necessary funding and investment.
- 7.1.13 As can be seen in Table 7-2, there are defence upgrades scheduled during epoch 1 in nine different ODUs. In practice some of the works could be grouped together, for example, works at Milford on Sea in ODUs 16, 17 and 18 could be appraised and constructed as one scheme. The schemes outlined in epoch 1 as part of the leading options are generally 'low regret' and are needed to manage existing risks that are happening now (such as beach lowering at Milford on Sea, outflanking risk at Highcliffe etc.).
- 7.1.14 The timelines set out in Table 7-2 are subject to acquiring the required funding and both BCP and NFDC have committed to developing a funding strategy following approval of the Strategy. If the required funding cannot be secured it may result in the FCERM delivery team following different pathways through the options (for example the Backup or National Options) which may delay scheme delivery.
- 7.1.15 Spend profiles for each of the Strategy leading options can be found in the Economic Appraisal Report (Appendix F). There is uncertainty as to exact year in which measures will be implemented and therefore spend across 5-year increments are shown.

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Table 7-1: Strategy implementation programme by ODU and time epoch

ODU	Option shown	2024-2044	2044-2074	2074-2124
1- Hengistbury Head East	Local – Managed Realignment	Capital refurbishment of defences	Capital refurbishment of defences	Capital refurbishment of defences
2 – Mudeford Sandbank	Local – Adaptation / Resilience	Capital refurbishment of defences, PLR	Capital refurbishment of defences, PLR	Beach nourishment scheme, capital refurbishment of defences, PLR
3 – Christchurch Harbor South	Local – Adaptation / Resilience C	Verge / slope armouring, PLR	Capital refurbishment of slope armouring, PLR	Capital refurbishment of slope armouring, PLR
4 – Wick	Local – Sustain B	Raise and lengthen setback embankment, capital refurbishment of frontline quay wall	Further raise and lengthening of setback embankment, capital refurbishment of frontline quay wall.	Further raise and lengthening of setback embankment, capital refurbishment of frontline quay wall
5 – Willow Drive and the Quomps	Local – Improve B (shown as example)	Raise height and lengthen defences (subject to option alignment choice)	-	Capital refurbishment of defences
6 – River Avon West Bank	National – Adaptation / Resilience	Capital refurbishment of existing quay walls, PLR	Capital refurbishment of existing quay walls, PLR	Capital refurbishment of existing quay walls, PLR
7 – Rossiters Quay	National – Improve A	-	Raise height of defences (setback walls, embankment and quay walls)	-
9 - Stanpit	National – Sustain A	-	Raise and lengthen defences	Further raising of defences
10 – Mudeford	National – Improve A	Capital refurbishment of quay walls, PLR	Capital refurbishment of quay walls, PLR	Raise height and lengthen defences
11 - Mudeford Quay	Local – Adaptation / Resilience	Capital refurbishment of quay walls, PLR	Capital refurbishment of quay walls, PLR	Capital refurbishment of quay walls, PLR
12 – Avon Beach and Friars Cliff	Local – Improve C	Beach nourishment scheme, replace / upgrade groynes and upgrade seawall	Beach nourishment top-ups	Beach nourishment top-ups and PLR
13 – Highcliffe	Local – Improve A	New outflanking defence	Beach nourishment scheme and capital refurbishment of defences	Beach nourishment top-ups and upgrades to groynes and rock revetment

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ODU	Option shown	2024-2044	2044-2074	2074-2124
14 – Naish Cliff and Barton on Sea	National – Managed Realignment A	Upgrade rock toe defences and lengthen the revetment to cover Marine Drive West. Install new cliff drainage at Marine Drive and Marine Drive West.	-	Capital refurbishment of rock toe defences and cliff drainage.
15 – Barton on Sea to Hordle Cliff	National – Do Nothing	-	-	-
16 – Cliff Road	Local – Managed Realignment A	Beach nourishment scheme and construct local strong point.	Beach nourishment top-ups	Beach nourishment top-ups
17 – Rook Cliff	Local – Improve A	Upgrade rock defences and construct groynes to help retain beach material.	-	Capital refurbishment of defences
18 – Milford on Sea	Local – Improve A	Beach nourishment scheme, upgrade seawall and upgrade / replace groynes.	Construct setback tidal defences adjacent to Sturt Pond and PLR. Beach nourishment top-ups	Beach nourishment top-ups and PLR

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Table 7-2 Indicative key dates for defence upgrades in epoch 1, subject to acquiring suitable funding and adaptive pathways / trigger thresholds

Activity	Date
ODU 3 – Christchurch Harbour South (verge / slope armouring to historic landfill) Historic landfill / contaminated land investigations Commence detailed appraisal Approval Construction start Construction completion	2026 2029 2032 2033 2035
ODU 4 - Wick (lengthening / raising defence embankment) Commence detailed appraisal Approval Construction start Construction completion	2030 2032 2033 2035
ODU 5 – Willow Drive and the Quomps (frontline / setback defence improvements) Commence detailed appraisal Approval Construction start Construction completion	2026 2029 2030 2032
ODU 12 – Avon Beach and Friars Cliff (beach nourishment, groyne / seawall improvement) Commence detailed appraisal Approval Construction start Construction completion	2033 2035 2036 2038
ODU 13 – Highcliffe (outflanking defence) Commence detailed appraisal Approval Construction start Construction completion	2033 2035 2036 2038
ODU 14 – Naish Cliff and Barton on Sea (cliff drainage, toe defence upgrades) Drainage trial and analysis Commence detailed appraisal Approval Construction start Construction completion	2025 2028 2032 2033 2035
ODU 16 – Cliff Road (beach nourishment, local strong point) Commence detailed appraisal Approval Construction start Construction completion	2026 2029 2030 2032
ODU 17 – Rook Cliff (upgrade rock defences) Commence detailed appraisal Approval Construction start Construction completion	2026 2029 2030 2032
ODU 18 – Milford on Sea (beach nourishment, upgrade defences) Commence detailed appraisal Approval Construction start Construction completion	2026 2029 2030 2032

Outcome measures contributions

7.1.16 Table 7-3 summarises the Outcome Measure (OM) contributions of the leading options in each SMZ. For the purposes of this table it has been assumed that the Local Aspirational Option will be delivered in ODUs where one has been identified. In other ODUs where there is not a Local Aspirational Option identified it has been assumed that the National Option will be delivered.

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7.1.17 Note that the same assumptions as outlined in the Partnership Funding scores presented in Section 6 apply to this table (i.e. assuming a jump forward in time for OM2 and OM3s delivered by schemes).

7.1.18 In total the leading options would be expected to deliver over £168million in PV benefits over the strategy duration.

7.1.19 Over 700 OM2s would be expected in SMZ 2. The OM2a values presented in Table 7-3 only include the residential properties initially at risk from flooding at the time of the scheme implementation and the OM2b properties are the residential properties that would otherwise have been at risk a short time period after (in approx. 20 years, from the 2040s). These OM2 values do not include the additional properties that would become at risk due to sea level rise by the end of the scheme service life, or non-residential properties. When these additional properties are considered, in total 1,977 properties within SMZ 2 (of which 1,656 are residential) would be expected to benefit from an improved standard of protection from flooding by the Strategy.

7.1.20 In total 1,178 OM3s would be expected across SMZ 3, SMZ 4 and SMZ 6. These are the properties that would be better protected against erosion risk.

Table 7-3 Outcome measures contributions

Outcome Measure	SMZ 1	SMZ 2	SMZ 3	SMZ 4	SMZ 5	SMZ 6	Total
OM1 Economic Benefit							
PV Benefits (£k)	89	98,800	15,924	23,489	0	30,071	168,373
OM2 Households at risk improving risk bands (nr)		258					258
OM2b Households at risk improving risk Bands (Nr)		446					446
OM3 Households at risk better protected (Nr)			297	303	0	578	1,178

7.2 Procurement strategy

7.2.1 Prior to any appraisal or construction works a review of procurement routes available to appoint the required Professional Services and Contractors to deliver the schemes will be undertaken by BCP and NFDC.

7.2.2 Professional Services will be appointed following respective BCP and NFDC procurement rules and would likely utilise the Southern Coastal Group Coastal, Flood & Infrastructure Professional Services Framework or similar – depending on frameworks in place at time of procurement.

7.2.3 Professional Services will be appointed using a standard NEC Professional Services Contract or through a standard ‘design and build’ NEC Engineering and Construction Contract. Secondary contracts for minor or ancillary works will be appointed through standalone quotation / tender procedures or through existing the Southern Coastal Group Coastal Engineering Minor Works Framework.

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7.3 Delivery risks

High level risk register

7.3.1 A high level risk register for the delivery of the Strategy has been developed collaboratively as a project team and is outlined in Table 7-4. The adopted mitigation measures are outlined. It will be reviewed at regular intervals during the Strategy delivery and updated accordingly as new risks develop.

Table 7-4 High level risk schedule and mitigation

Key project risk	Adopted mitigation measure
Political	
Change in local authority leadership and priorities resulting in reduced support and resource prioritisation for the schemes	Support already established. It is unlikely that a change would result in reduced support for the Strategy given that the FCERM risk in the area is high and mitigation is high on the public agenda.
Economic	
Affordability of future schemes	BCP / NFDC are committed to raising the external contributions needed to deliver the works from this Strategy.
Requirements for significant external funding, reliance on FCRM GiA funding to augment external funding	Upfront engagement and collaboration with potential beneficiaries has taken place throughout strategy development.
Reduced GiA contribution due to change in guidance of PF score thresholds	BCP / NFDC will develop a funding Strategy upon completion of the Strategy and the adaptive pathways provides sufficient flexibility to delay schemes if required due to funding limitations.
Actual option costs are higher than currently estimated	The maximum recommended optimism bias of 60% has been adopted to the costs in the strategy economics and Partnership Funding calculations. An additional 30% uplift was applied to account for known risks. Costs are based on the latest available cost price information (i.e. SPONS 2024) and have accounted for inflation.
The schemes may not be attractive or in support of the plans of external developers/investors	Ensure early engagement with potential investors to align their development plans with coastal protection options, thus making the schemes more attractive.
Technical	
Climate change / sea level rise occurs at a different rate than predicted	The Strategy has sufficient adaptive capacity to adjust course / adaptive pathways as risks develop. The schemes outlined in epoch 1 as part of the leading options are 'low regret' and needed to manage existing risks that are happening now (such as beach lowering at Milford on Sea, outflanking risk at Highcliffe etc.)
Problems in supply of suitable materials when constructing new defences. Particularly over 100 year implementation timescale	Phasing of works is flexible to allow for variation in materials supply and costs. Further studies such as the scheme business cases and detailed design will establish suitable materials and supply for each scheme.
Publication of new data or guidance	Ensure subsequent strategy updates / additional studies / business cases / detailed designs utilise the most up to date guidance and datasets. A range of sensitivity tests have been carried out on the strategy options and demonstrate a robust strategy. Changes in guidance should therefore not have a significant impact on the Strategy recommendations.
Development of adjacent Hurst Spit to Lymington FCERM Strategy and potential implications of Hurst spit evolution on Christchurch Bay	FCERM decisions made via the Hurst Spit to Lymington Strategy regarding the evolution of Hurst Spit should be cognisant of the potential impacts on coastal processes within the sediment cell and other coast protection risks as a whole (i.e. shoreline alignment and potential sediment source locations). The project teams from both Strategies have liaised throughout the development of both projects and the Christchurch Bay and Harbour Strategy leading options support the short, medium and long term evolution of the spit by providing an additional sediment feed to the spit.
Social	
Implementation difficulties – e.g. on agreeing preferred defence route alignment, planning objections etc.	Early and ongoing engagement with key landowners and stakeholders along the frontage will be carried out to agree and confirm suitable alignments for the schemes required during epoch 1. Any special

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	access requirements or provisions will also be ascertained to ensure the option is feasible.
Environment	
HRA / WFD compliance during scheme development	The Strategy HRA Appropriate Assessment and WFD assessment have identified the locations where project level assessments are required. There are opportunities for the scheme designs to minimise impact (through construction mitigation / alignment decisions) and mechanisms for providing compensatory habitat if required (such as the Regional Habitat Creation Programme).

Safety plan

- 7.3.2 Public health and safety will form a key consideration in scheme development and will be considered throughout the option appraisal, outline and detailed design phases and will form part of the designer's risk assessment. This approach will be continued through the construction phase with any risks included in the Health and Safety file.
- 7.3.3 Consideration will be given to CDM and key health and safety issues as the leading Strategy options are advanced through further appraisal and design. Designer risk assessments will be written and appropriate records will be kept throughout future stages of each scheme. Where risks are identified that cannot be resolved entirely then appropriate mitigation measures will be developed wherever possible to reduce the probability of the risk occurrence.
- 7.3.4 Risk assessments will be carried out prior to any work starting on site to ensure the safety of the public during and after construction.

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8 Appendices

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Appendix A Project appraisal report data sheet

Entries required in clear boxes, as appropriate.

GENERAL DETAILS

Authority Project Ref. (as in forward plan):

Project Name
(60 characters
max.):

Christchurch Bay and Harbour FCERM Strategy

Promoting Authority: Defra ref (if known)
Name

Bournemouth, Christchurch and Poole Council

Emergency Works:

No Yes/No

Strategy Plan Reference:

NA

River Basin Management Plan

Hampshire Avon Catchment Flood
Management Plan (2012)

System Asset Management Plan

NA

Shoreline Management Plan:

Poole and Christchurch Bay SMP 2
(2011)

Project Type:

FCERM Strategy

Shoreline Management Study/ Preliminary Study/ Strategy Plan/Prelim. Works to Strategy/ Project within Strategy/Stand-alone Project/
Strategy Implementation/Sustain SOS. Coast Protection/Sea Defence/Tidal Flood Defence/Non-Tidal Flood Defence/Flood Warning
Tidal/Flood Warning - Fluvial/Special

CONTRACT DETAILS

Estimated start date of works/study:

03/2021

Estimated duration in months:

45

Contract type*

Framework

(*Direct labour, Framework, Non Framework, Design/Construct)

COSTS

	APPLICATION (£000's)
Appraisal:	NA
Costs for Agency approval:	140,319
Total Whole Life Costs (cash):	313,209

For breakdown of costs see Table in Section 2.4

CONTRIBUTIONS

Windfall Contributions:	NA
Deductible Contributions:	NA
ERDF Grant:	NA
Other Ineligible Items:	NA

LOCATION - to be completed for all projects

EA Region/Area of project site (all projects):	WSX and SSD
Name of watercourse (fluvial projects only):	
District Council Area of project (all projects):	Bournemouth, Christchurch and Poole Council. New Forest District Council
EA Asset Management System Reference:	
Grid Reference (all projects):	SZ1791

(OS Grid reference of typical midpoint of project in form ST064055)

DESCRIPTION

Specific town/district to benefit:

Christchurch, Barton on Sea, Milford on Sea

Brief project description including essential elements of proposed project/study
(Maximum 3 lines each of 80 characters)

FCERM Strategy that sets out the leading options, adaptive pathways and timings to sustainably address coastal flood and erosion risk over the next 100 years

DETAILS

Design standard (chance per year):	Varies	yrs
Existing standard of protection (chance per year)	Varies	yrs
Design life of project:	100 years	yrs
Fluvial design flow (fluvial projects only):	NA	m ³ /s
Tidal design level (coastal/tidal projects only):	Varies	m
Length of river bank or shoreline improved:	27,000	m
Number of groynes (coastal projects only):	To be determined at scheme stage	
Total length of groynes* (coastal projects only):	To be determined at scheme stage	m
Beach Management Project?	No	Yes/No
Water Level Management (Env) Project?	No	Yes/No
Defence type (embankment, walls, storage etc)	Varies	

* i.e. total length of all groynes added together, ignore any river training groynes

ADDITIONAL AGREEMENTS:

Maintenance Agreement(s):	NA	Not Applicable/Received/Awaited
EA Region Consent (LA Projects only):	South West and Southern	Not Applicable/Received/Awaited
Non Statutory Objectors:	No	Yes/No
Date Objections Cleared:	NA	
Other:	NA	Not Applicable/Received/Awaited

ENVIRONMENTAL CONSIDERATIONS

Natural England (or equivalent) letter:	Received	Not Applicable/Received/Awaited
Date received	14/11/23	

SITES OF INTERNATIONAL IMPORTANCE

(Answer Y if project is within, adjacent to or potentially affects the designated site)

Special Protection Area (SPA):	Yes	Yes/No
Special Area of Conservation (SAC):	Yes	Yes/No
Ramsar Site	Yes	Yes/No
World Heritage Site	No	Yes/No
Other (Biosphere Reserve etc)	Yes	Yes/No

SITES OF NATIONAL IMPORTANCE (Answer Y if project is within, adjacent to or potentially affects the designated site)

Environmentally Sensitive Area (ESA):	Yes	Yes/No
Site of Special Scientific Interest (SSSI):	Yes	Yes/No
National/Regional Landscape Designation:	Yes	Yes/No
National Park/The Broads	No	Yes/No
National Nature Reserve	No	Yes/No
AONB, RSA, RSC, other	No	Yes/No
Scheduled Ancient Monument	Yes	Yes/No
Other designated heritage sites	Yes	Yes/No

OTHER ENVIRONMENTAL CONSIDERATIONS

Listed structure consent	NA	Not Applicable/Received/Awaited
Water Level Management Plan Prepared?	No	Yes/No
FEPA licence required?	No	Not Applicable/Received/Awaited
Statutory Planning Approval Required	NA	Yes/No/Not Applicable

COMPATIBILITY WITH OTHER PLANS

Shoreline Management Plan	Yes	Yes/No/Not Applicable
River Basin Management Plan	Yes	Yes/No/Not Applicable
Catchment Flood Management Plan	Yes	Yes/No/Not Applicable
Water Level Management Plan	NA	Yes/No/Not Applicable
Local Environment Agency Plan	Yes	Yes/No/Not Applicable

SEA/ENVIRONMENTAL IMPACT ASSESSMENT

SEA	Statutory stakeholder approval	Statutory required/Agency voluntary/not applicable
EIA	NA	Yes (schedule 1); Yes (schedule 2); SI1217; not applicable
SEA/EIA status	Final	Scoping report prepared/draft/draft advertised/final

Other agreements	Detail	Result	(Not Applicable/Received/Awaited for each)
	HRA	Natural England letter of support obtained	
	WFD	Reviewed by Environment Agency and support conclusions	
	MCZ	Natural England letter of support obtained	
	SEA	Natural England letter of support obtained. Historic England letter of support obtained. Environment Agency reviewed and support conclusions.	

Costs, benefits and scoring data

(Apportion to this phase if part of a strategy)

Local authorities only: For projects done under Coast Protection Act 1949, please separately identify: FRM = Benefits from reduction of asset flooding risk; CERM = Benefits from reduction of asset erosion risk

Benefit type (DEF: reduces risk (contributes to Defra SDA 27); CM: capital maintenance; FW: improves flood warning; ST: study; OTH: other projects)

DEF

LAND AREA

Total area of land to benefit:	475		Ha
of which present use is:	FRM	CERM	
Agricultural:	0	0	Ha
Developed:	224	147	Ha
Environmental/Amenity:	65	39	Ha
Scheduled for development		0	Ha

PROPERTY & INFRASTRUCTURE PROTECTED

	Number		Value (£'000s)	
	FRM	CERM	FRM	CERM
¹ Residential	1703	1176	47,492	54,316
Commercial/Industrial	352	185	23,172	4,298
Critical Infrastructure	Various	Various		
Key Civic Sites	NA	NA		
Other (description below):				
Description:				

costs and Benefits

¹ Present value of total project whole life costs (£'000s):	140,319	
Project to meet statutory requirement? Y/N	N	
	Value (£'000s)	
	FRM	CERM
Present value of residential benefits:	47,492	54,316
Present value of commercial/industrial benefits:	23,172	4,298
Present value of other benefits (infrastructure, agriculture, environment/amenity, health):	39,095	
¹ Present value of total benefits (FRM & CERM)	168,373	
Net present value:	28,054	
Benefit/cost ratio:	1.20	
Base date for estimate:	2024	
FCERM-AG Decision Rule stage 3 applied	Yes	Yes/No
FCERM-AG Decision Rule stage 4 applied	Yes	Yes/No

OTHER OUTCOME MEASURE SCORING DETAILS

Super Output Area No*:	Varies	Indicate if deprived:	Varies	Yes/No
(*as ranked by Indices of Multiple Deprivation)				
Risk:	N/A	VH, H or N/A		
	Wetland	Saltmarsh/ Mudflat		
Net gain of BAP habitat:	N/A	N/A	Ha	
SSSI protected:	N/A	Ha		
Other Habitat:	N/A	Ha		
Heritage Sites:	N/A	"I or II", "II or other" or "N/A"		

Exemption Details (if exempt from OM scoring system)

Exempt from Scoring: No Yes/No

Outcome measure prioritisation priority score overleaf based on initial / major scheme recommended in leading options. The values presented assume a 'jump forward' in time to year of scheme implementation and details may vary when schemes are actually implemented in the future. The values presented only include the ODUs that have had Partnership Funding scores calculated and do not cover the full Strategy area (see Table 10-1 in Economics Appendix for more details).

Outcome measure prioritisation priority score

Stage 1 - Calculate individual scores						
Ref	Description	Project contributions (including adjustments)			Targets	Individual scores
OM1	Present value of Whole Life Benefits (£000s)	227,266 o1			Divided by 3,700,000 t1	Gives OM1 individual score 0.061 s1
OM2	Number of households moved from any flood / coastal erosion probability category to a lower one (households)	1,434 o2	Minus o2b	164 o2b	Divided by 100,000 t2	Gives OM2 individual score 0.013 s2
OM2b	Number of households moved from the very significant or significant flood probability category to the moderate or low flood probability category; or equivalent coastal erosion probability categories (households)	164 o2b	Minus o3	0 o3	Divided by 36,000 t2b	Gives OM2b individual score 0.005 s2b
OM3	Number of households in deprived communities at reduced flood risk (households)	0 o3			Divided by 9,000 t3	Gives OM3 individual score 0 s3
OM5	The number of hectares Biodiversity Action Plan habitat created, net of compensatory habitat (Hectares)	0 o5			Divided by 800 t5	Gives OM5 individual score 0 s5

Stage 2 - Calculate overall OM prioritisation score

Score

Outcome Measure prioritisation score (total of individual scores divided by whole life cost)

$$0.061 + 0.013 + 0.005 + 0 + 0 =$$

$$(s1 + s2 + s2b + s3 + s5)$$

Divided by

140,319

Project whole life costs

Multiplied by
1,000,000

0.56

OM prioritisation score

- Appendix B List of Reports Produced**
- Appendix C Leading Option Report**
- Appendix D Long List to Short List Report**
- Appendix E Adaptive Pathway Illustrations**
- Appendix F Economics Appraisal Report**
- Appendix G Action and Implementation Plan**
- Appendix H Cost and Funding Profiles**
- Appendix I List of Consultees**
- Appendix J Stakeholder Engagement Report**
- Appendix K SEA Report**
- Appendix L HRA Report**
- Appendix M WFD Report**
- Appendix N MCZ Assessment Report**
- Appendix O Natural England and Historic England Letters of Support**
- Appendix P Carbon Technical Note**
- Appendix Q Coastal Processes Report**
- Appendix R Defence Condition Report**
- Appendix S Stakeholder Engagement Phases 1-5 Summary Reports**
- Appendix T Option Development Unit Maps**

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Version	Details	Date	Prepared	Checked
1	Draft for client review	02/04/2024	BT	JS
2	Update following review	22/04/2024	BT	JS

General notes

- The sea level rise trigger thresholds are relative to the present day sea level (2024)
- The defence condition trigger threshold of 'poor' is for an the overall asset. However, there may be local variations in the condition of defence assets that could mean that localised repairs are needed before the trigger threshold is reached.
- Defence maintenance should be guided by detailed condition assessments undertaken regularly and this action plan should not be relied upon to inform maintenance requirements / timing
- The adaptive pathway figures are to be updated for all units so the epoch dates match those within this spreadsheet
- The cost profiles have been obtained directly from the 'Christchurch FCERM Strategy funding profiles_v5_240130' and the same limitations / assumptions apply (i.e. strategic level costing, subject to change)
- ODU 8 is not included as it has been agreed with the Environment Agency that future River Avon projects will appraise this area

Decision tree notes

- The decision tree diagrams are for illustrative purposes only and may not include all key decisions that need to be made when delivering the Strategy
- The decision tree diagrams have been produced to provide more detail for epoch 1. However, if key decisions within an ODU are due in epoch 2 or 3, the decision tree also provides this information

ODU 1 - Hengistbury Head East

Key features / risks

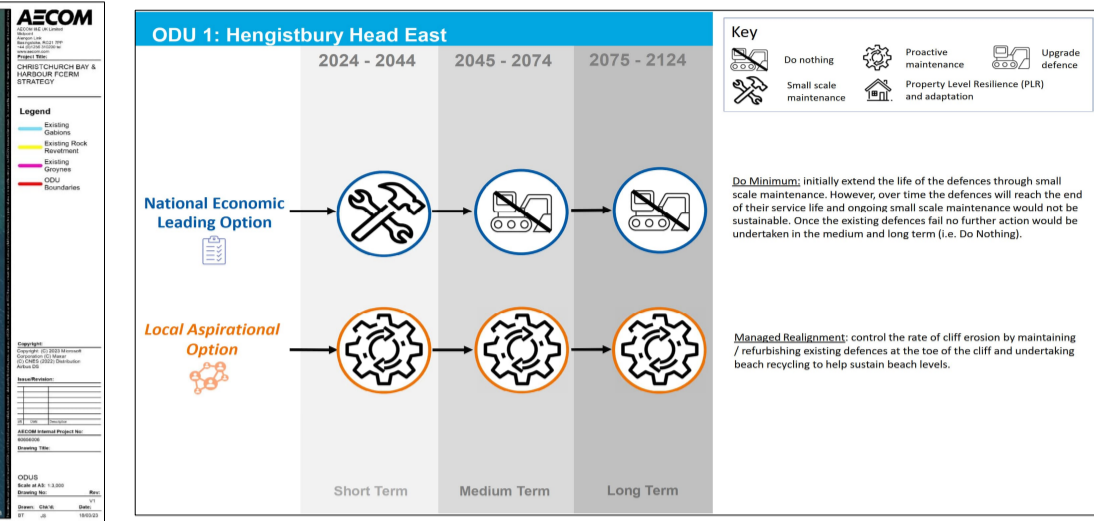
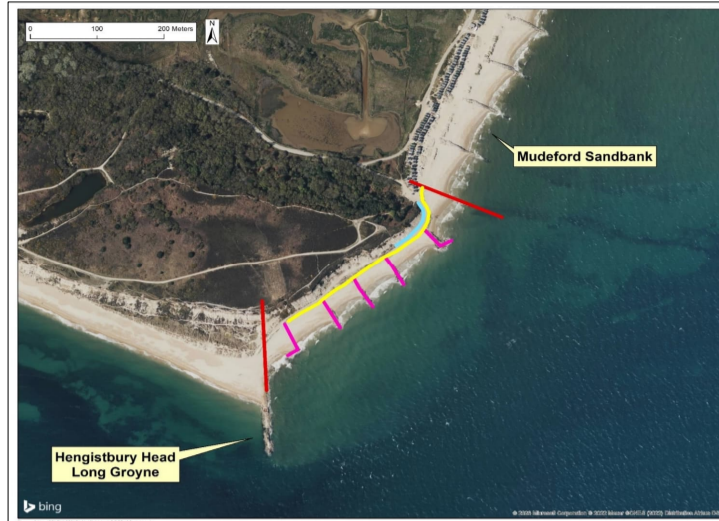
- No flooding / erosion risk to properties
- Erosion risk to headland and scheduled monument / environmental designations (SSSI, SAC, SPA, LNR)
- Existing rock defences at base of cliff including rock revetment and rock groyne
- Unmanaged erosion of headland 'anchor point' could threaten Mudeford Sandbank and wider morphology

Strategy Leading Options

- National and Local Option identified
- National Option is Do Minimum whereas Local Option is Managed Realignment
- Local Option (Managed Realignment) provides more confidence in future coastline position and would involve refurbishing existing rock defences over time. Some limited erosion expected to occur due to cliff slope processes
- National Option (Do Minimum) would not involve replacing existing defences when they fail and erosion would be expected

Map of Leading Options

- Alignments are indicative and will vary subject to further appraisal



Works required to deliver leading options*

Option	Epoch 1			Epoch 2	Epoch 3
	Years 2025 - 2029	Years 2030 - 2034	Years 2035 - 2039		
National	No planned works other than small scale patch & repair and ensuring H&S compliance. Review S&P policy to align with the option if this is the option delivered.				
Local	Develop funding strategy. Undertake defence condition assessments. Begin planning defence refurbishments (as condition is already poor for some assets). Secure funding and consenting for refurbishments. Undertake beach management as required.	Refurbish existing rock defences. Undertake beach management as required.	Undertake beach management as required.	Further refurbishments of existing defences.	Further refurbishments of existing defences.

*note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
 *timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£K - cash)																
	Epoch 1 (years)			Epoch 2 (years)				Epoch 3 (years)			Total						
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2079	2080-2084	2085-2089	2090-2094	2105-2114	2115-2124	
National	23	46	91	183	37	0	0	0	0	0	0	0	0	0	0	0	654
Local	40	54	2,098	54	40	54	40	2,112	40	54	94	2,152	94	2,152	94	9,172	

*note that defence refurbishments timing may need to be adjusted if refurbishments are required sooner (to be informed by detailed defence condition assessment)

FCERM GiA funding availability

- FCERM GiA funding unlikely to be available for defence works due to BCR < 1 on national basis

Trigger Points

Category	Influence on	Details of key decisions when implementing options	Triggers
Defence condition	Timing of defence refurbishments in Local Option	<ul style="list-style-type: none"> If implementing the Local Option: <ul style="list-style-type: none"> The existing rock defences were assessed to have a 'Poor' or 'Fair' condition in the Strategy defence condition assessment, with an estimated residual life (without maintenance) of <10 for the 'poor' defences and 10-15 years for the 'fair' defences. Ongoing small scale / patch repair maintenance would be expected to extend the life of these asset but they are still expected to require a refurbishment during epoch 1. More detailed defence condition assessments are required to inform the exact timing of defence refurbishments. The timing of the refurbishments should be based on these detailed condition inspections and may need to be brought forward or delayed accordingly. It is recommended that when the condition reaches a 'poor' rating then a refurbishment is undertaken as soon as possible once funding is secured. Given the Strategy defence condition assessment identified that some of the defences are already in a poor condition, it is recommended that planning for the refurbishments begins in the first years of the Strategy implementation. 	Condition rating of Poor
Funding	Decision on Local vs National Option and timing of embankment improvements	<ul style="list-style-type: none"> The Local Option will have a funding shortfall for the defence refurbishment works. The Funding Strategy will need to outline how the defence refurbishments will be funded. If funding is not likely, then these refurbishment works could be delayed until the funding is secured or the National Option delivered instead. 	Funding availability Revert to National Option if funding for refurbishments is not secured

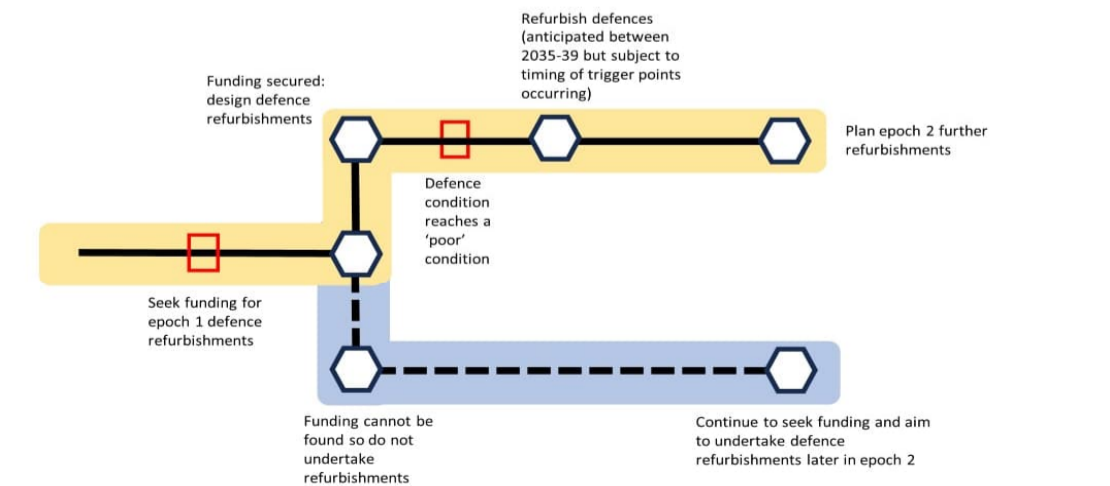
Decision Tree



ODU 1: Hengistbury Head East Decision tree

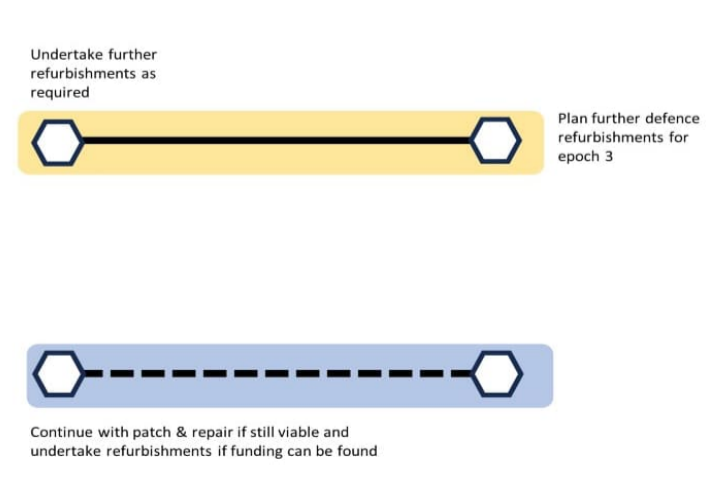
Epoch 1 (2024-2044)

Present day (2024) Time & Sea level rise 2044 or 0.13m SLR



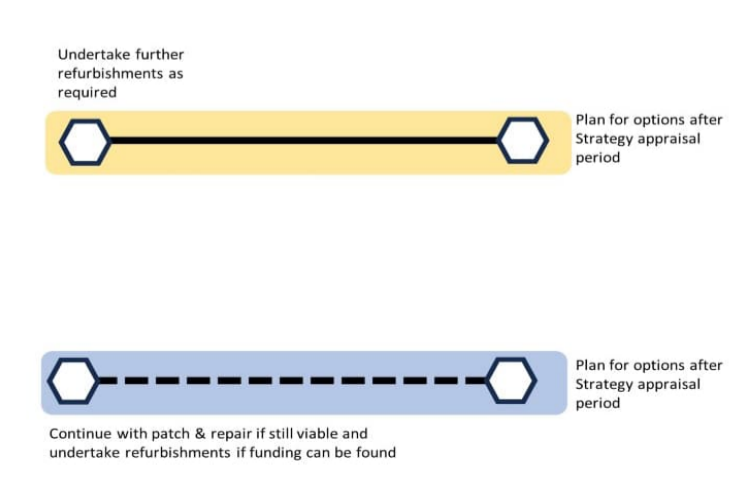
Epoch 2 (2045-2074)

Time & Sea level rise 2074 or 0.42m SLR



Epoch 3 (2075-2124)

Time & Sea level rise 2124 or 1.06m SLR



ODU 2 - Mudeford Sandbank

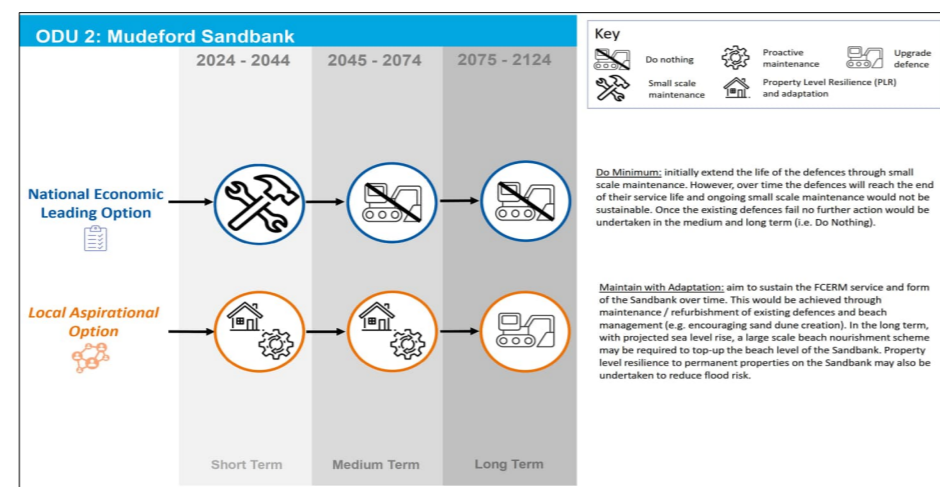
Key features / risks

- Six properties at risk from flooding (2124 0.5% AEP) so therefore there is only limited economic benefits on a national basis
- Large number of beach huts and recreational / amenity resource on the Sandbank providing local benefit to the area
- With no further interventions the Sandbank is expected to roll back over time. Risk of breaching
- Buried services beneath the Sandbank which could be damaged if the Sandbank rolls back significantly
- Uncertain impact on coastal morphology should Sandbank roll back in an unconstrained manner



Strategy Leading Options

- National and Local Option identified
- National Option is Do Minimum whereas Local Option is Maintain with Adaptation
- Local Option (Maintain with Adaptation) aims to sustain the FCERM service of the Sandbank by holding its form over time and aiming to keep it broadly in its current position. Achieved through beach nourishment, defence refurbishments and property level resilience.
- National Option (Do Minimum) would not involve replacing existing defences when they fail and rollback of the Sandbank would be expected



Map of Leading Options

- Alignments are indicative and will vary subject to further appraisal
- PLR requirements to be determined on property by property basis as required



Works required to deliver leading options*

Option	Years 2025 - 2029	Years 2030 - 2034	Years 2035 - 2039	Years 2040 - 2044	Epoch 2 Years 2045-2074	Epoch 3 Years 2075-2124
National	No planned works other than small scale patch repair and ensuring HMA compliance Review DMP policy to align with this option if this is the option delivered					
Local	Develop funding strategy Undertake defence condition assessments Undertake beach management as required Review DMP policy to align with this option if this is the option delivered	Begin planning defence refurbishments Secure funding and consenting for refurbishments Undertake beach management as required	Refurbish existing defences on the Sandbank Undertake beach management as required	Undertake beach management as required	Further refurbishments of existing defences	Beach Nourishment scheme Further refurbishments of existing defences

*note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
*timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£k) - cash													Total		
	Epoch 1 (years)				Epoch 2 (years)				Epoch 3 (years)							
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2084	2085-2094	2095-2104	2105-2114	2115-2124	
National	46	91	183	183	365	365	73	0	0	0	0	0	0	0	0	1,304
Local	23	37	3,688	37	37	37	3,688	37	37	37	3,057	3,725	1,566	3,725	74	19,805

*note that defence refurbishments timing may need to be adjusted if refurbishments are required sooner (to be informed by detailed defence condition assessment)

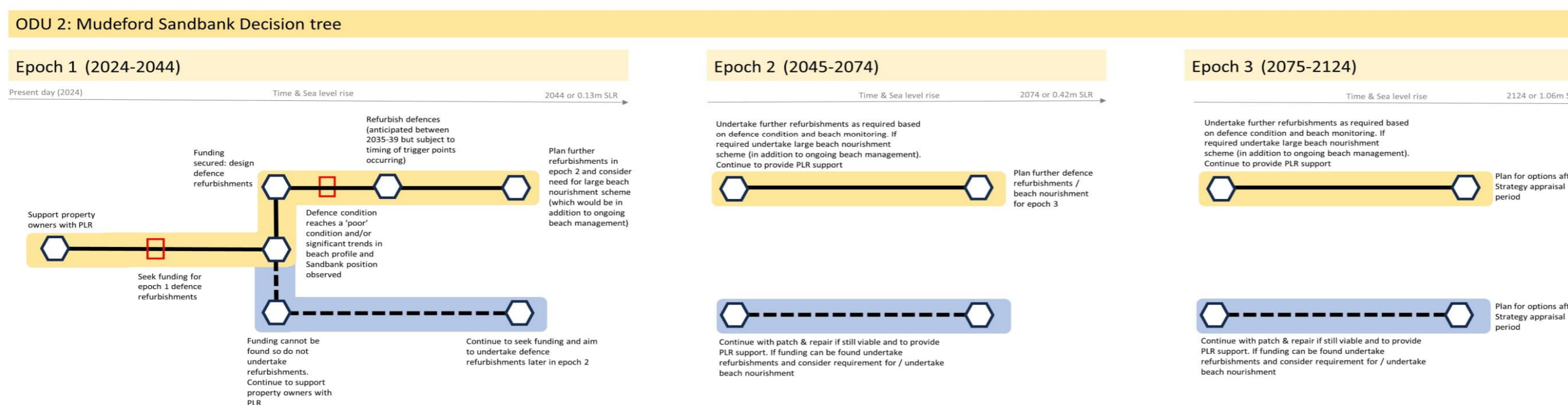
FCERM GIA funding availability

- FCERM GIA funding unlikely to be available for defence works due to BCR < 1 on national basis

Trigger Points

Category	Influence on	Details of key decisions when implementing options	Triggers
Defence condition	Timing of defence refurbishments in Local Option	- If implementing the Local Option: - The existing risk defences were assessed to have a "Good" or "Fair" condition in the Strategy defence condition assessment, with an estimated residual life (without maintenance) of >10 years - Ongoing small scale / patch repair maintenance would be expected to extend the life of these asset but they are still expected to require a refurbishment during epoch 1 - The requirement for a refurbishment will need to be determined based on detailed condition inspections and may need to be brought forward or delayed accordingly based on the results of the inspections - It is recommended that when the condition reaches a "Poor" rating then a refurbishment is undertaken	Condition rating of Poor
Sandbank beach monitoring	Timing of defence refurbishments in Local Option	- If implementing the Local Option: - The existing defences (rock groynes) currently help control beach levels and the position of the Sandbank - There is a risk that the existing defences could become less effective over time in response to storms / sea level rise - It is recommended that the Sandbank beach profiles continues to be monitored on a regular basis (i.e. every 6 months) to identify any trends in the beach profile / Sandbank movement - If the beach profile trends indicate that the beach profile is changing beyond the typical range or there is evidence of the Sandbank position moving significantly then this could be a trigger for refurbishing / modifying the existing defences - A long term record of monitoring is required to enable long term significant trends to be identified relative to typical seasonal variations	- A consistent trend in beach profile change / Sandbank position (not typical seasonal change)
Funding	Decision on Local vs National Option and timing of defence refurbishments	- The Local Option will have a funding shortfall for the defence refurbishment works and beach nourishment (in epoch 3) - The Funding Strategy will need to outline how the defence refurbishments will be funded. If funding is not likely, then these refurbishment works could be delayed until the funding is secured or the National Option could be delivered instead	- Funding availability - Revert to National Option if funding for refurbishments is not secured

Decision Tree



ODU 3 - Christchurch Harbour South

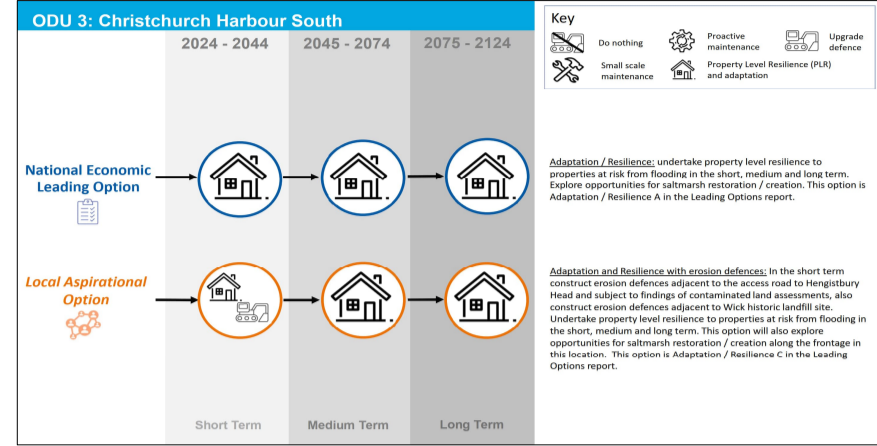
Key features / risks

- Eight properties at risk from flooding (2/124 0.5% AEP event) so therefore there is limited economic benefits on a national basis
- Two historic landfill sites (Wick and east of Double Dykes) adjacent to the shoreline and potentially at risk from erosion
- Contamination status of historic landfill sites is unknown at this stage
- Only access road onto Hengistbury Head also adjacent to shoreline and potentially at risk from erosion



Strategic Leading Options

- National and Local Option Identified
- National Option is Adaptation / Resilience (A) whereas Local Option is Adaptation / Resilience (C) with erosion defences
- Local Option (Adaptation / Resilience C with defences) aims to provide property level resilience measures to properties at risk of flooding
- and new defences to Wick historic landfill as well as refurbish defences to the access road to Hengistbury Head (also defending Double Dykes historic landfill site)
- National Option (Adaptation / Resilience A) would include property level resilience measures to properties at risk but would not include defences to landfill / access road



Map of Leading Options

- Alignments are indicative and will vary subject to further appraisal
- PLR requirements to be determined on property by property basis as required



Works required to deliver leading options*

Option	Years 2025 - 2029	Years 2030 - 2034	Epoch 1	Years 2035 - 2039	Years 2040 - 2044	Epoch 2	Epoch 3
National	Identify properties that would benefit from property level resilience measures Engage with property owners and support property level resilience funding applications / implementation as required Review SAMP policy to align with this option if this is the option delivered						
Local	Develop leading strategy Undertake historic landfill investigations to determine contamination status of the landfill sites Identify properties that would benefit from property level resilience measures Engage with property owners and support property level resilience funding applications / implementation as required Review SAMP policy to align with this option if this is the option delivered		Business case development, outline design and secure funding for erosion defences at Wick historic landfill and Hengistbury Head Access Road (if required pending contaminated land assessment) Approval of business case Outline design, consenting and procurement for erosion defences Construction of erosion defences			Maintenance / refurbishment of erosion defences as required Continued support for PLR measures to property owners	

*note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
*timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£k - cash)														
	Epoch 1 (years)			Epoch 2 (years)						Epoch 3 (years)			Total		
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2084	2085-2094		2095-2104	2105-2114
National	11	11	51	11	11	11	11	11	11	11	23	63	46	579	46
Local	11	11	51	23	23	23	23	51	23	23	46	579	46	579	46

*note that defence upgrades / refurbishments timing may need to be adjusted if works are required sooner (to be informed by detailed defence condition assessment and historic landfill investigations)

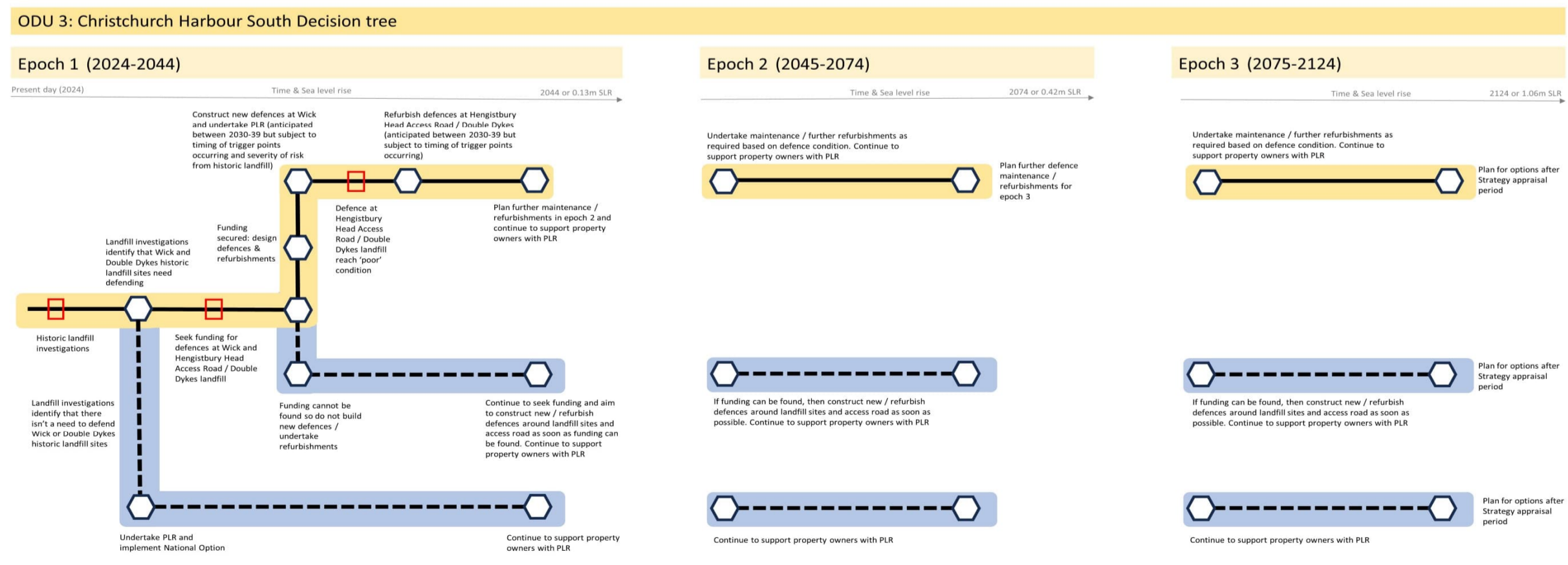
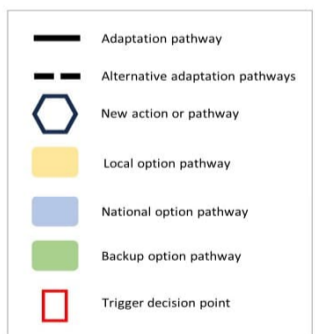
FCERM GIA funding availability

- FCERM GIA funding likely to be limited for defence works due to very few properties being at risk and lack of funding typically available for historic landfill defences

Trigger Points

Category	Influence on	Details of key decisions when implementing options	Triggers
Historic landfill status	Decision on Local vs National Option	It is recommended that site investigations into the contaminated land status of the historic landfill sites are undertaken This will inform whether the new defences are required around the historic landfill sites and help steer the decision on whether the Local Option or National Option is delivered If the land is found to be contaminated then the Local Option should be delivered as a preference / if funding allows The investigations will also help better inform environmental assessments, such as WFD assessment, at scheme level appraisal	Contaminated land status
Defence condition	Timing of defence refurbishments / upgrades at Hengistbury Head Access Road in local option	If implementing the Local Option: There is currently a gabion basket wall adjacent to the Hengistbury Head Access road at the location where it is closest to the shoreline The gabion basket wall is not included in the Strategy defence condition assessment and therefore the condition status is not known It is recommended that routine defence condition assessments are undertaken on this structure to determine its initial condition status and change over time Ongoing small scale / patch repair maintenance would be expected to extend the life of this asset but it is likely that a refurbishment would be needed during epoch 1 It is recommended that when the condition reaches a "Poor" rating then a refurbishment is undertaken	Condition rating of Poor
Funding	Decision on Local vs National Option and timing of defence refurbishments	The Local Option will have a funding shortfall for the defences around Wick historic landfill and any refurbishments to the defence at the Hengistbury Head Access Road The Funding Strategy will need to outline how the defences will be funded. If funding is not likely, then these defences would be delayed until the funding is secured or the National Option could be delivered instead	Funding availability Revert to National Option if funding for refurbishments is not secured

Decision Tree



ODU 4 - Wick

Key features / risks

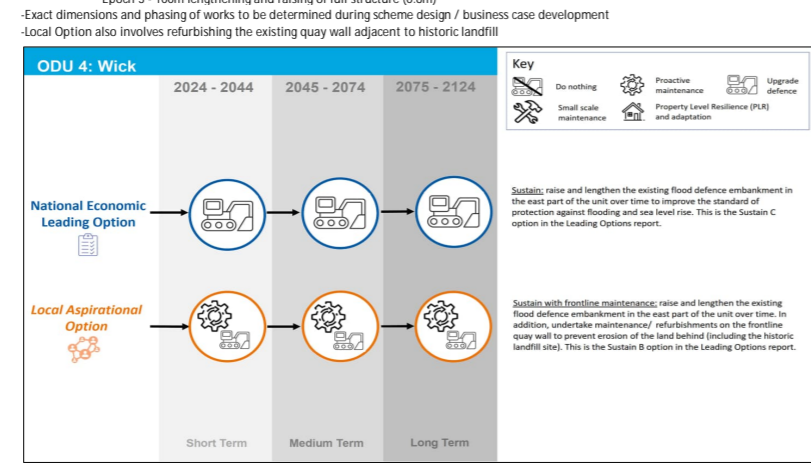
- Flood risk to residential area in west part of unit expected to increase over time with sea level rise
- Two properties at risk from flooding from present day 0.5% AEP event, 121 properties at risk in 2124 0.5% AEP event
- Existing earth embankment defence originally constructed to 2070 20yr SdP (EA comm)
- Latest modelling indicates embankment would be sufficient to the south, increasing in severity over time
- Historic landfill site north of Wick Lane. Contamination status of land unknown
- Quay wall adjacent to historic landfill site will fail at end of service life, leading to erosion of historic landfill
- Adjacent to environmental designations, including LNR & SSSI

Strategy Leading Options

- National and Local Option identified
- Both options involve raising and lengthening the setback embankment in the east part of the unit over time
- Raising and lengthening would be done incrementally
- Approx. changes to embankment required:
 - Epoch 1 - subject to alignment, between 100m to 400m lengthening to the south (low height <0.5m)
 - Epoch 2 - 170m lengthening and raising of full structure (<0.5m)
 - Epoch 3 - 100m lengthening and raising of full structure (0.6m)
- Exact dimensions and phasing of works to be determined during scheme design / business case development
- Local Option also involves refurbishing the existing quay wall adjacent to historic landfill

Map of Leading Options

- Alignments are indicative and will vary subject to further appraisal



Works required to deliver leading options*

Option	Years 2025 - 2029		Years 2030 - 2034		Epoch 1		Years 2035 - 2039		Years 2040 - 2044		Epoch 2		Epoch 3			
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2079	2080-2084	2085-2089	2090-2094	2105-2114	2115-2124
National	34	606	34	34	34	34	34	34	34	1,929	68	68	68	68		
Local	34	606	34	1,162	870	34	34	34	1,162	34	1,162	1,196	68	68	1,196	11,627

*note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
 *timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£k) - cash																
	Epoch 1 (years)				Epoch 2 (years)				Epoch 3 (years)				Total				
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2079	2080-2084	2085-2089	2090-2094	2105-2114	2115-2124	
National	34	606	34	34	34	34	34	34	34	1,929	68	68	68	68			3,984
Local	34	606	34	1,162	870	34	34	34	1,162	34	1,162	1,196	68	68	1,196	11,627	

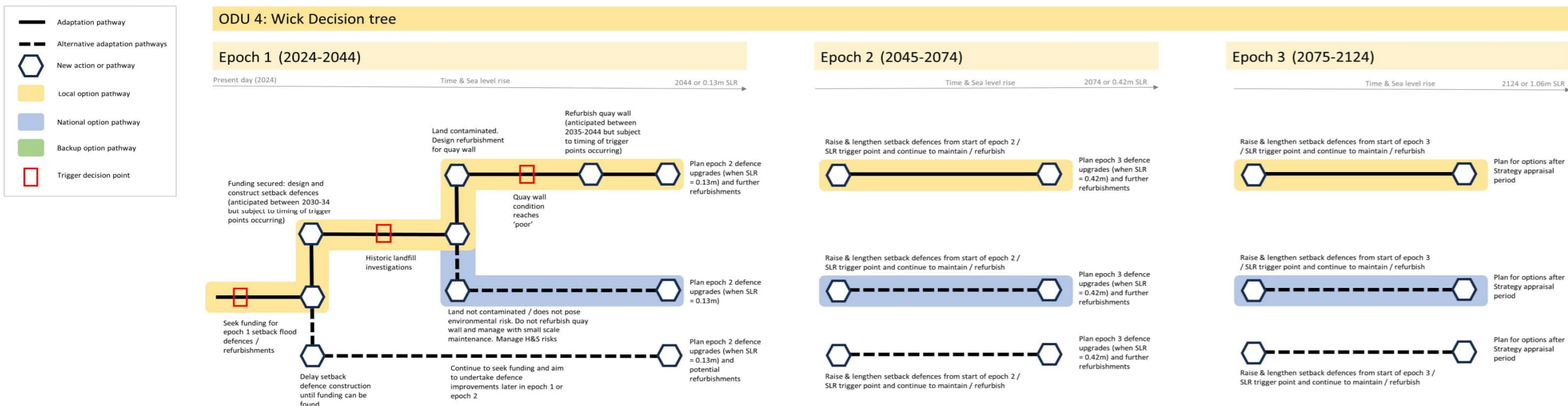
FCERM GIA funding availability

- Indicative FCERM GIA funding availability calculated for largest scheme as part of the national / local option (epoch 3 defence upgrades)
- Indicative amount of FCERM GIA available for epoch 3 upgrades estimated to be in region of £735-809k
- GIA also likely to be available for defence upgrades in epoch 1 and 2, but fewer benefits so amount of GIA likely to be considerably less
- See economics report for assumptions when calculating indicative GIA availability (such as baseline year)

Trigger Points

Category	Influence on	Details of key decisions when implementing options	Triggers
Sea level rise	Embarkment improvements for Local and National Options	<ul style="list-style-type: none"> The Strategy National and Local Options follow a managed adaptive approach whereby the setback embankment is raised / lengthened incrementally over time in response to rising sea levels For each embarkment improvement, the target SdP is for a SdP at the end of the epoch. For example, the epoch 2 improvement undertaken at the start of the epoch will aim to achieve a target SdP for 2074. Note that more work to define the SdP will need to be reviewed during business case development In the National and Local options, estimates have been made as to when the embankment will need improving based on projections for sea level rise (UKCP18, RCP 8.5, 70%ile). Should sea level rise occur faster / slower than projected, this will change the timing of when embankment improvements are required The projected sea level rise between present day and the start of epoch 2 is 0.13m The projected sea level rise between present day and the start of epoch 3 is 0.42m The embankment improvement in epoch 1 is not related to sea level rise but due to outflanking risk identified in the River Avon model for present day model simulations. Therefore the timing of this intervention will remain unchanged (i.e. midway through epoch 1). The planning / business case development for the second and third rounds of defence improvements (in epochs 2 and 3 respectively) should be undertaken when the structure design life is close to falling below the design SdP of the previous round of defence upgrades. Based on existing UKCP18 sea level rise projections, and assuming the defences are designed to a target SdP at the start of each epoch, the planning / business case development should begin when sea level rise reaches 0.13m (epoch 2) and 0.42m (epoch 3). 	<ul style="list-style-type: none"> Commencement of second round of embarkment planning / upgrades when SLR is 0.13m Commencement of third round of embarkment planning / upgrades when SLR is 0.42m
Historic landfill status	Decision on Local vs National Option	<ul style="list-style-type: none"> It is recommended that site investigations into the contaminated land status of the historic landfill site are undertaken This will help inform how important it is to refurbish the quay wall adjacent to the historic landfill site and help steer the decision on whether the Local Option or National Option are delivered The Local Option includes a provision for refurbishing the frontline quay wall over time to ensure that it continues to provide erosion protection to the historic landfill behind If the land is found to be contaminated then the Local Option should be delivered as a preference / if funding allows The investigations will also help better inform environmental assessments, such as WFD assessment, at scheme level appraisal 	Contaminated land status
Defence condition	Timing of quay wall refurbishments in Local Option	<ul style="list-style-type: none"> If implementing the Local Option The frontline quay wall was assessed to have an 'Fair' condition in the Strategy defence condition assessment, with an estimated residual life (without maintenance) of 10-15 years Ongoing small scale / patch repair maintenance would be expected to extend the life of this asset but it is still expected to require a refurbishment during epoch 1 (assumed to be around year 15 in the appraisal) The requirement for a refurbishment will need to be determined based on detailed condition inspections and may need to be brought forward or delayed accordingly based on the results of the inspections It is recommended that when the condition reaches a 'Poor' rating then a refurbishment is undertaken 	Condition rating of Poor
Funding	Decision on Local vs National Option and timing of embarkment improvements	<ul style="list-style-type: none"> The National and Local Options will have a funding shortfall for the embarkment improvement works in each epoch (i.e. FCERM GIA will not cover the full cost) The funding shortfall is likely to be most significant for the earlier interventions (i.e. epochs 1 and 2) because the benefits are not expected to have increased significantly yet, relative to epoch 3 The Funding Strategy will need to outline how the epoch 1 embarkment improvements will be funded. If funding is not likely, then these embarkment improvement works could be delayed until the funding is secured This will increase the residual risk to properties at risk from outflanking prior to the works being completed, but it is not until epoch 3 when significant numbers of properties are expected to be at risk here (with current SLR projections) and therefore risks could be managed on an individual property by property basis. With existing FCERM GIA Funding rules, for the Local Option, it is unlikely that FCERM GIA will cover a significant proportion (if any) of the refurbishment costs as the primary benefit will be to defend historic landfill from erosion (and not properties) The Funding Strategy will need to outline how the quay wall refurbishment works will be funded. If funding is not likely then the National Option could be delivered as a fallback in the interim. This could lead to the failure of the quay wall and therefore health and safety compliance measures would be needed in this location. 	Funding availability Revert to National Option if funding for quay wall refurbishment is not secured

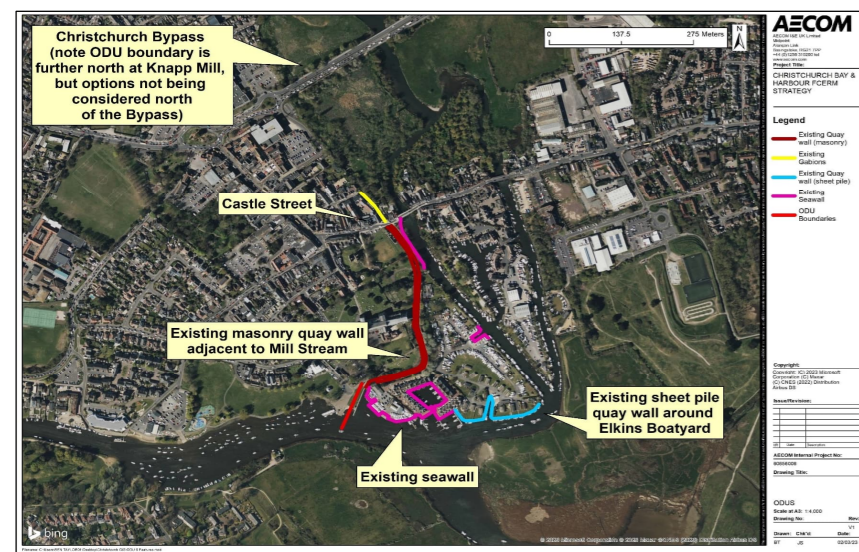
Decision Tree



ODU 6 - River Avon West Bank

Key features / risks

- 126 properties at risk from flooding in the future (2124 0.5% AEP event).
- Flooding also in proximity to key historic environment designations such as scheduled monument
- Economic case for new defences is weak due to length of defences required
- Two main areas of flood risk: Elkins Boatyard / Priory Quay and adjacent to Castle Street. Risk comes from River Avon and Millstream

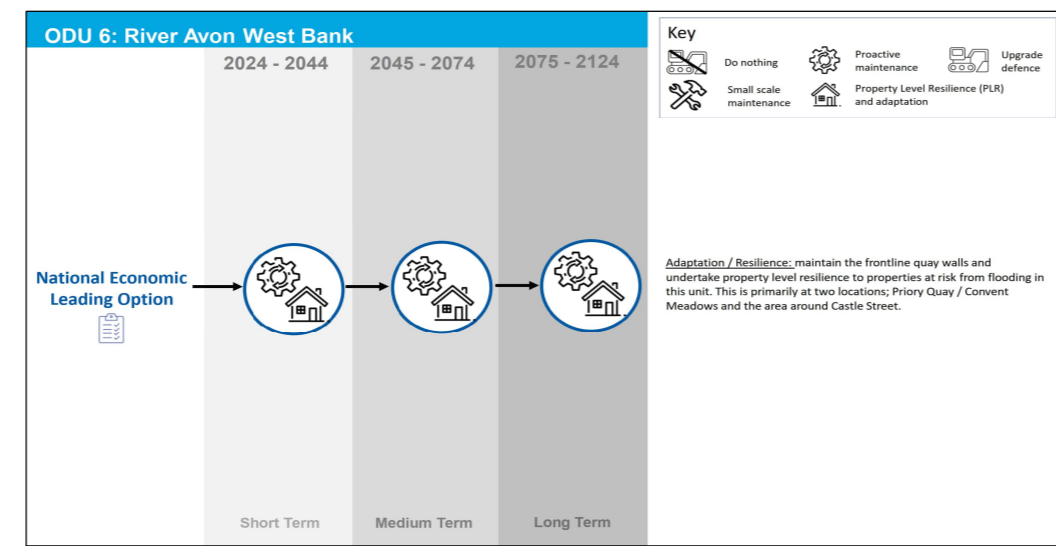


Strategy Leading Options

- National Option is Adaptation / Resilience which involves PLR and maintenance of defences
- No Local Option identified here

Map of Leading Options

- Alignments / areas for PLR are indicative and will vary subject to further appraisal



Works required to deliver leading options*

Option	Epoch 1		Epoch 2	Epoch 3
	Years 2025 - 2029	Years 2030 - 2034		
National	Identify properties that would benefit from property level resilience measures Engage with property owners and support property level resilience funding applications / implementation as required Develop funding strategy for defence refurbishments		Ongoing PLR measures Plan quay wall refurbishments, acquire consenting and funding for refurbishment Undertake refurbishment of quay wall	Ongoing PLR, maintenance and defence refurbishments Ongoing PLR, maintenance and defence refurbishments

*note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
*timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£k) - cash														
	Epoch 1 (years)			Epoch 2 (years)						Epoch 3 (years)			Total		
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2084	2085-2094		2095-2104	2105-2114
National	641	11	11	1,582	701	11	11	11	1,582	953	23	2,900	23	23	8,508

*note that defence refurbishments timing may need to be adjusted if refurbishments are required sooner (to be informed by detailed defence condition assessment)

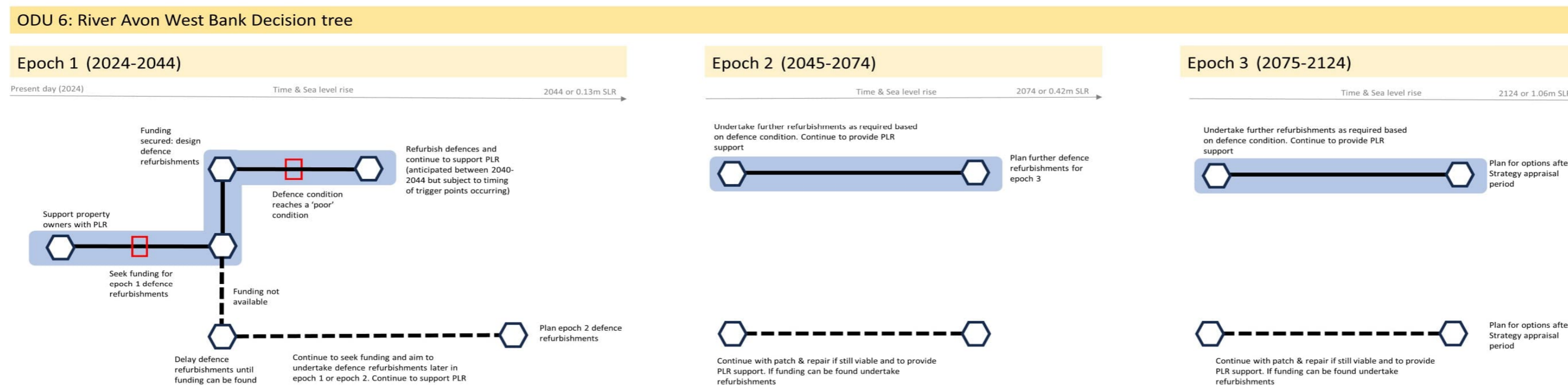
FCERM GiA funding availability

- FCERM GiA funding unlikely to be available for PLR as part of the leading option. Other sources of funding could be available

Trigger Points

Category	Influence on	Details of key decisions when implementing options	Triggers
Defence condition	Timing of defence refurbishments	- There are currently quay walls and sheet pile walls in this unit that will need refurbishing over time - Generally in fair / good condition based on Strategy defence condition assessment - In the Strategy costing estimates have been made with regards to the timing of defence refurbishments based on estimated residual life - It is recommended that routine defence condition assessments are undertaken on the structures to determine initial condition status and change over time - Ongoing small scale / patch repair maintenance would be expected to extend the life of these assets but it is likely that a refurbishment would be needed during epoch 1 - It is recommended that when the condition reaches a 'Poor' rating then a refurbishment is undertaken	- Condition rating of Poor
Funding	Timing of defence refurbishments	- The National Option may have a funding shortfall for the defence refurbishment works (unlikely FCERM-GiA will cover this work) - The Funding Strategy will need to outline how the defence refurbishments will be funded. If funding is not likely, then these refurbishment works could be delayed until the funding is secured	- Funding availability - Delay refurbishments if funding is not secured

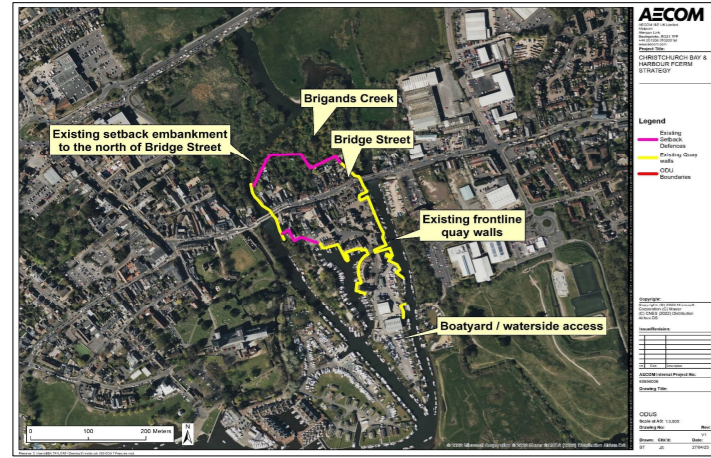
Decision Tree



ODU 7 - Rossiters Quay

Key features / risks

- Island within the River Avon. Residential / non-residential properties either side of Bridge Street
- Area has a high SoP for the present day but over time due to SLR the SoP will fall.
- By 2124 there are 57 properties expected to be at risk from 0.5% AEP event
- A lack of space to construct new defences in parts of this unit and waterside alignments therefore likely to be required
- During design key issues to consider include access to the water and the natural creek (Brigands Creek) that pass through the defences

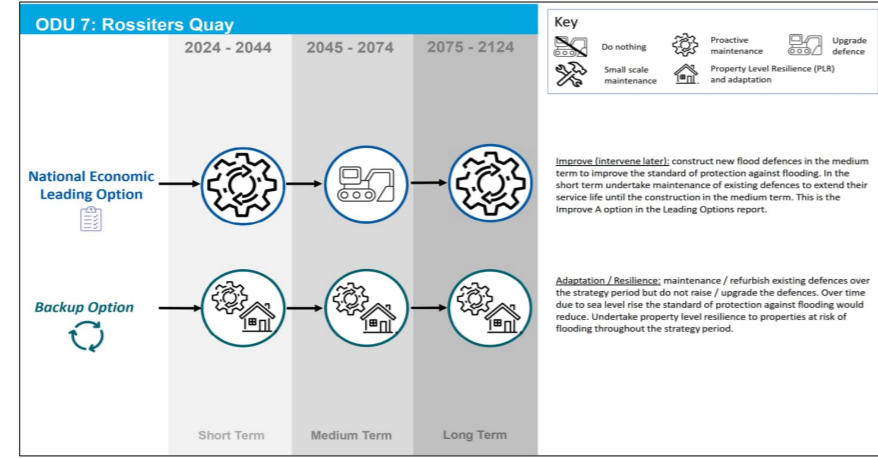


Strategy/Leading Options

- National Option and Backup Option identified
- National Option is Improve (A) that involves raising existing defences / new defences from epoch 2
- Backup option is Adaptation / Resilience which involves undertaking PLR and maintaining existing defences through refurbishments

Map of Leading Options

- Alignments are indicative and will vary subject to further appraisal



Works required to deliver leading options*

Option	Epoch 1		Epoch 2		Epoch 3	
	Years 2025 - 2029	Years 2030 - 2034	Years 2035 - 2039	Years 2040 - 2044	Years 2045 - 2074	Years 2075 - 2124
National	Develop leading strategy for defence improvements / scheme / include to epoch 2			Business case development, outline design and secure funding for defence improvements in epoch 2	Approval of business case	
Backup	Identify properties that would benefit from property level resilience measures. Engage with property owners and support property level resilience funding applications / implementation as required. Develop funding strategy for defence refurbishments.			Engaging PLR measures. Undertake refurbishment, design, consenting and funding for refurbishment	Engaging maintenance and defence refurbishment, design, consenting and funding for PLR	Engaging maintenance and defence refurbishment and support to property owners for PLR

*note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
 *timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£k) - cash														Total	
	Epoch 1 (years)				Epoch 2 (years)				Epoch 3 (years)				Total			
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2079	2080-2084		2085-2089	2090-2114	2115-2124
National	11	11	11	11	8,014	23	23	23	23	23	46	46	46	46	46	8,403
Backup	41	11	11	1,821	746	11	11	1,821	821	23	1,833	878	23	1,833	9,895	9,895

*note that defence refurbishments timing may need to be adjusted if refurbishments are required sooner (to be informed by detailed defence condition assessment)

FCERM GIA funding availability

- Indicative FCERM GIA funding availability calculated for initial defence upgrade scheme as part of the national option
- Indicative amount of FCERM GIA available for defence upgrade scheme estimated to be in region of £632k
- See economics report for assumptions when calculating indicative GIA availability (such as baseline year)

Trigger Points

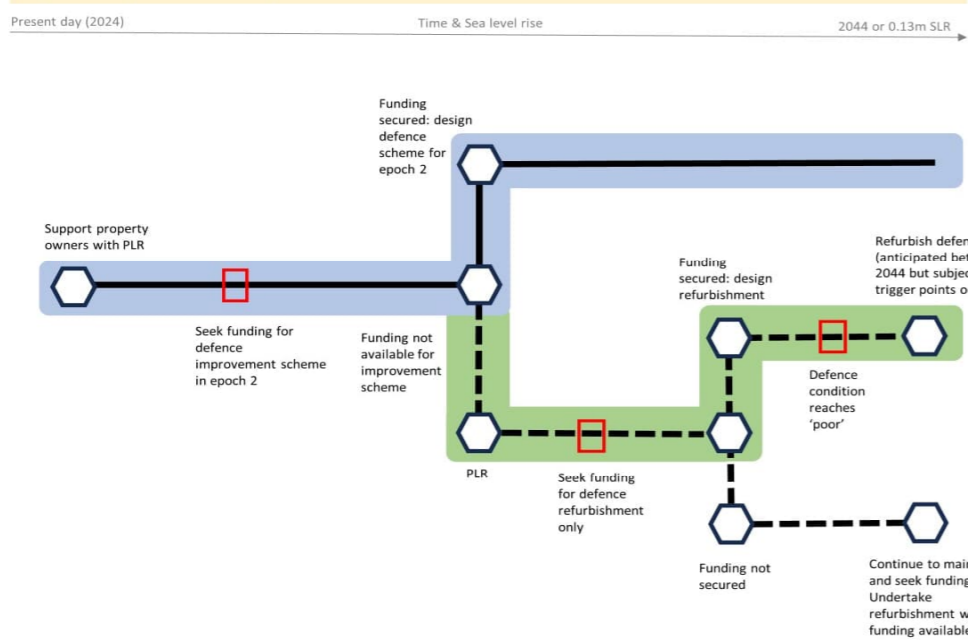
Category	Influence on	Details of key decisions when implementing options	Triggers
Defence condition	Timing of scheme for National Option / refurbishments for Backup Option	- There are currently quay walls / raised defences in this unit that provide flood defence - Generally in fair / good condition based on Strategy defence condition assessment - It is recommended that routine defence condition assessments are undertaken on the structures to determine initial condition status and change over time - Ongoing small scale / patch repair maintenance would be expected to extend the life of these assets. - However, when the condition of the defences / quay walls deteriorates then either construction of the defence improvement scheme will be required (national option) or a refurbishment required (backup) - It is recommended that when the condition reaches a "Poor" rating then the scheme / refurbishment is undertaken	- Condition rating of Poor
Sea level rise	Timing of scheme for National Option	- The National Option involves upgrading the defences in the future (most likely in epoch 2). The exact timing of this should be informed by rates of sea level rise and the onset of flood risk in the future (as well as the defence condition) - According to the Environment Agency AIMS dataset, the raised defences in the unit typically have a crest level of approximately 2.4-2.5m OD (although this does vary and there are some sections with a lower crest level, particularly on the west side). - 2.4m OD is in excess of a present day 1 in 1000 year AEP water level in the harbour (not considering any defence freeboard or water level gradients up the River Avon). However, with sea level rise, the SoP of the defence will fall over time and the risk of overflow / outflanking will increase. - Should the objective be to sustain a 1 in 200 year SoP and if a 0.3m freeboard is assumed, the defences will need to be raised once the 200 year extreme water level in the Harbour reaches within 0.3m of the existing crest elevation. This equates to a water level of approximately 2.1-2.2m OD which is approximately 0.09-0.19m sea level rise from the 200 year present day water level. - Existing UKCP18 SLR projections indicate 0.13m of sea level rise is expected to occur by the start of epoch 2 and this represents an approximate mid-point for the 0.09m-0.19m range. Therefore it is suggested that a 0.13m trigger for sea level rise is used for undertaking planning / construction for the defence raising. - It should be noted that the crest level in parts of this unit is lower than 2.4-2.5m and therefore some sections may need raising sooner if the desire is to sustain a 1 in 200yr SoP before a scheme is constructed. However, there is not sufficient detail available to assess the need for this in the Strategy and detailed analysis of flow paths / deflecto defences would be required to draw any conclusions.	- Begin National Option scheme planning / business case development when SLR is 0.13m
Funding	Timing of scheme for National Option / choice switching to Backup Option	- The National Option may have a funding shortfall for the scheme / defence improvement works (unlikely FCERM GIA will cover all of this work) - The Funding Strategy will need to outline how the scheme will be funded. If funding is not likely, then the scheme could be delayed or the option choice switched to the Backup Option. - Funding will still be required for the defence refurbishments as part of the Backup Option but this amount is expected to be less	- Funding availability - Delay refurbishments if funding is not secured

Decision Tree

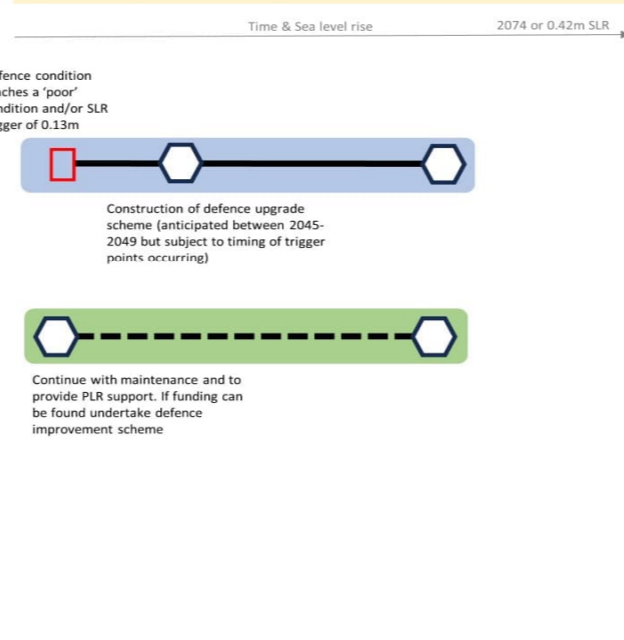


ODU 7: Rossiters Quay Decision tree

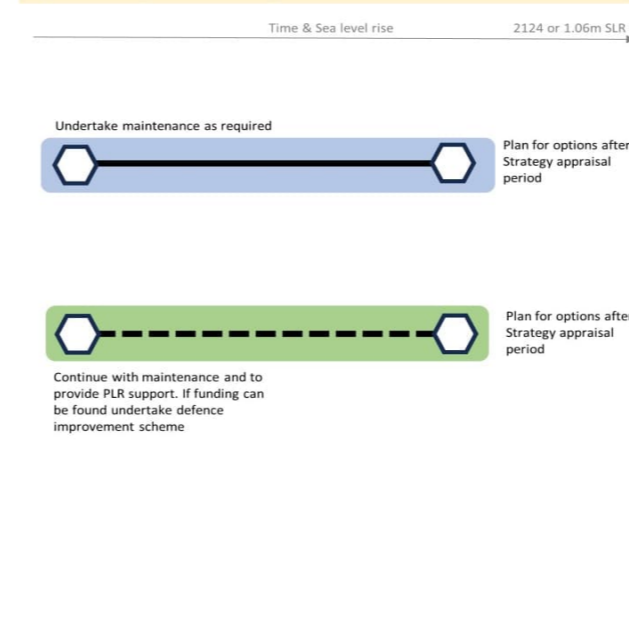
Epoch 1 (2024-2044)



Epoch 2 (2045-2074)



Epoch 3 (2075-2124)

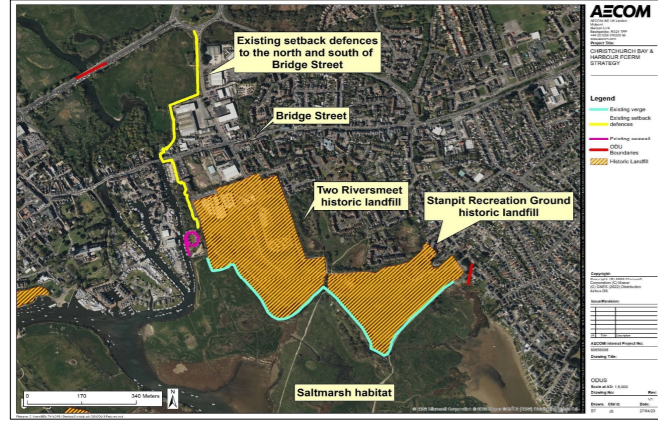


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ODU 9 - Stanpit

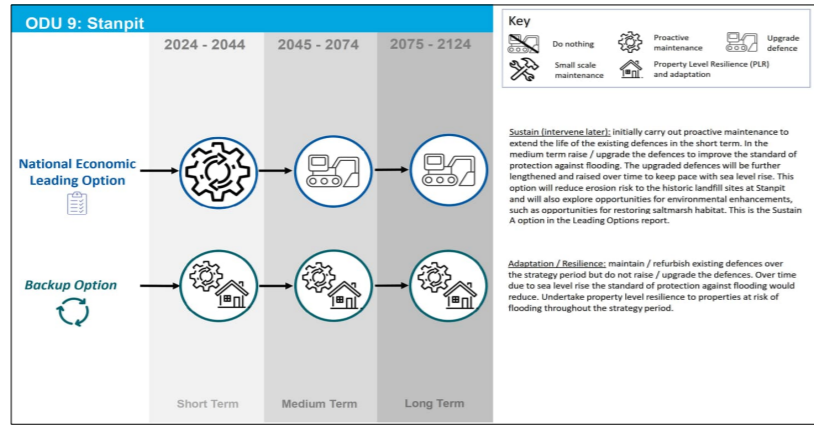
Key features / risks

- East bank of the River Avon and the North side of Christchurch Ground that are adjacent to the harbour
- Large areas of historic landfill sites at Two Rivermead and Stanpit Recreation Ground that are adjacent to the harbour
- Potentially contaminated land status of landfill sites is unknown
- Also there are expected to be a large number of properties at risk from flooding in the future
- By 2124 expected that 867 properties would be at risk from 0.5m AEP event



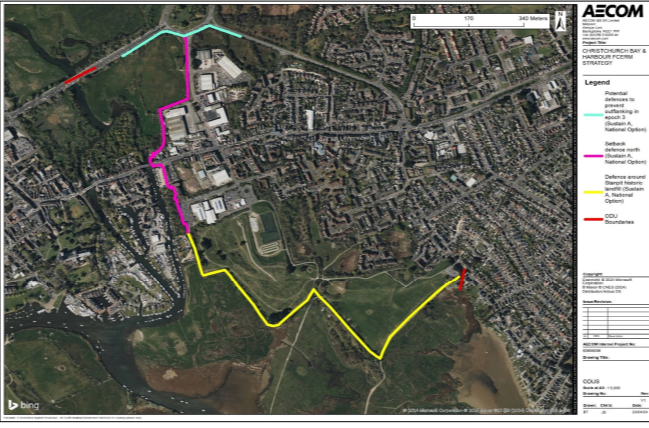
Strategy Leading Options

- National Option and Backup Option identified
- National Option is Sustain (A) that involves raising defences over time to keep pace with SLR (0.05 y SoP) from epoch 2.
- Sustain A also involves defences around the historic landfill and will seek opportunities for saltmarsh refurbishment
- Backup option is Adaptation / Resilience which involves undertaking PLR and maintaining existing defences (including around the historic landfill sites) through refurbishments



Map of Leading Options

- Alignments are indicative and will vary subject to further appraisal



Works required to deliver leading options*

Option	Years 2025 - 2029	Years 2030 - 2034	Epoch 1	Years 2035 - 2039	Years 2040 - 2044	Epoch 2	Epoch 3
National	Operate historic landfill investigations to determine contamination status of the landfill sites Develop funding strategy for defence improvements / scheme considered for epoch 2 Review SLP policy to align with this option if this is the option delivered				Determine scheme alignment (subject to historic landfill investigations) Business case development, scheme design and cost funding for defence improvements Approval of business case Detailed design, consenting and procurement for defence improvements	Construction for defence improvements	Start raising of defences in required staging increments
Backup	Operate historic landfill investigations to determine contamination status of the landfill sites Identify properties that would benefit from property level resilience measures Begin to primarily assess and support property level resilience measures Develop funding strategy for defence refurbishments Review SLP policy to align with this option if this is the option delivered				Carrying out measures Underpin need for defence maintenance around historic landfill sites (subject to outcome of historic landfill investigations). Refurbishment of other defences on the bank of the Avon would still be required if historic landfill defences not raised Plan defence refurbishments, secure consenting and funding for refurbishment Undertake refurbishment of defences	Carrying out maintenance and defence refurbishments and support to property owners for PLR	Carrying out maintenance and defence refurbishments and support to property owners for PLR

*Note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
 *Timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Epoch 1 (years)						Epoch 2 (years)						Epoch 3 (years)			Total		
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2079	2080-2084	2085-2089	2090-2104	2105-2114		2115-2124	
National	0	34	0	0	18,910	34	34	34	34	34	34	34	34	34	34	34	25,902	
Backup	24	34	34	1,811	8,945	34	34	34	34	1,811	34	4,520	1,845	8,730	68	68	1,350	29,279

*Note that defence refurbishments timing may need to be adjusted if refurbishments are required sooner (to be informed by detailed defence condition assessments)

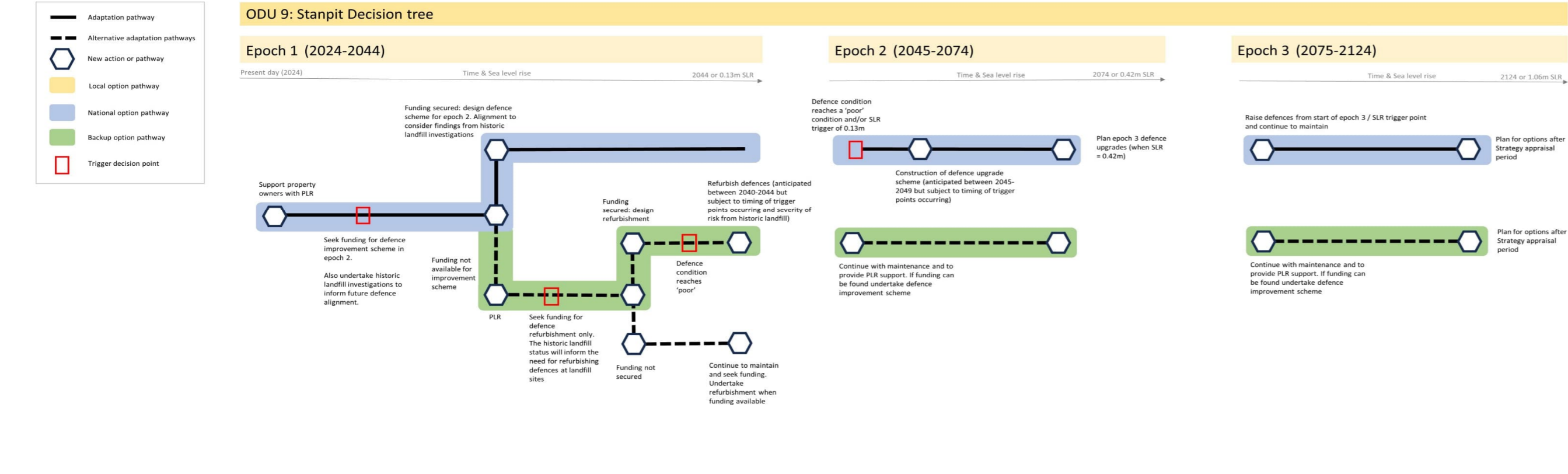
FCERM GIA funding availability

- Indicative FCERM GIA funding availability calculated for initial defence upgrade scheme as part of the national option
- Indicative amount of FCERM GIA available for defence upgrade scheme estimated to be in region of £2.7 million
- See economics report for assumptions when calculating indicative GIA availability (such as baseline year)

Trigger Points

Category	Influence on	Details of key decisions when implementing options	Triggers
Historic landfill status	Decision on defence alignment for National Option	It is recommended that site investigations into the contaminated land status of the historic landfill sites are undertaken This will inform whether the new defences are required around the historic landfill sites and help steer the decision on the defence alignment for the National Option If the land is found to be contaminated then defences around the landfill sites should be delivered as a preference / if funding allows The investigations will also help better inform environmental assessments, such as WFD assessment, at scheme level appraisal	Contaminated land status
Defence condition	Timing of scheme for National Option / refurbishments for Backup Option	There are currently raised defences in the unit that provide flood defence The condition for the majority of the defence length is unknown (data not available for the Strategy defence condition assessment). The AMIS dataset suggests a 'Fair' condition although this needs to be confirmed It is recommended that routine defence condition assessments are undertaken on the structure to determine initial condition status and change over time Ongoing small scale / patch repair maintenance would be expected to extend the life of these assets However, when the condition of the defences deteriorates then either construction of the defence improvement scheme will be required (national option) or a refurbishment required (Backup) It is recommended that when the condition reaches a 'Poor' rating then the scheme / refurbishment is undertaken	Condition rating of Poor
Sea level rise	Timing of scheme for National Option	The National Option involves upgrading the defences in the future (most likely in epoch 2). The exact timing of this should be informed by rates of sea level rise and the onset of flood risk in the future (as well as the defence condition) According to the Environment Agency AMIS dataset, the raised defences in the unit typically have a crest level of approximately 2.4.2 5m OD 2.4m OD in excess of a present day 1 in 1000 year AEP water level in the harbour (not considering any defence freboard or water level gradients up the River Avon). However, with sea level rise, the SoP of the defence will fall over time and the risk of overflow / outflanking will increase Should the objective be to sustain a 1 in 200 year SoP and if a 0.3m freboard is assumed, the defences will need to be raised once the 200 year extreme water level in the harbour reaches within 0.3m of the existing crest elevation. This equates to a water level of approximately 2.1.2 2m OD which is approximately 0.9m sea level rise from the 200 year present day water level Existing URCP18 SLR projections indicate 0.13m of sea level rise is expected to occur by the start of epoch 2 and this represents an approximate mid-point for the 0.09m-0.19m range. Therefore it is suggested that a 0.13m trigger for sea level rise is used for undertaking planning / construction for the defence raising It should be noted that the crest level in parts of the unit is lower than 2.4.2 5m and therefore some sections may need raising sooner if the desire is to sustain a 1 in 200yr SoP before a scheme is constructed. However, there is not sufficient detail available to assess the need for this in the Strategy and detailed analysis of flow paths / defacto defences would be required to draw any conclusions The planning / business case development for the second round of defence improvements (in epoch 3) should be undertaken when the structure design life is close to falling below the design SoP of the previous round of defence upgrades undertaken in epoch 2 Based on existing URCP18 sea level rise projections, and assuming the defences are designed to a target SoP at the start of epoch 3, the planning / business case development for the second round of upgrades should begin when sea level rise reaches 0.42m	Begin National Option scheme planning / business case development when SLR is 0.13m
Funding	Timing of scheme for National Option / choice switches to Backup Option	The National Option may have a funding shortfall for the scheme / defence improvement works (partly FCERM GIA will cover all of this work) The Funding Strategy will need to outline how the scheme will be funded if funding is not likely, then the scheme could be delayed or the option choice switched to the Backup Option Funding will still be required for the defence refurbishments as part of the Backup Option but it does not include one-off capital scheme costs that are as large as the National Option and therefore could be more deliverable.	Funding availability Delay refurbishments if funding is not secured

Decision Tree



ODU 10 - Mundeford

Key features / risks

- North side of Christchurch Harbour. Main land use is residential properties / gardens which back onto the shoreline
- River Mude and Bare Brook located at the eastern end of the unit
- Privately owned / maintained quay wall along length of unit
- 25 properties at risk for a present day 0.5% AEP event, increasing to 370 properties by 2124
- Future flood risk is relatively linear along the frontage

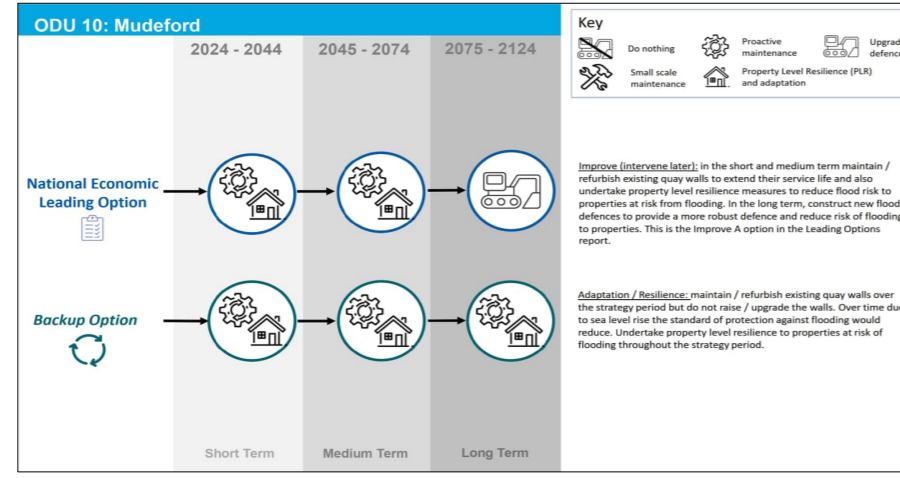
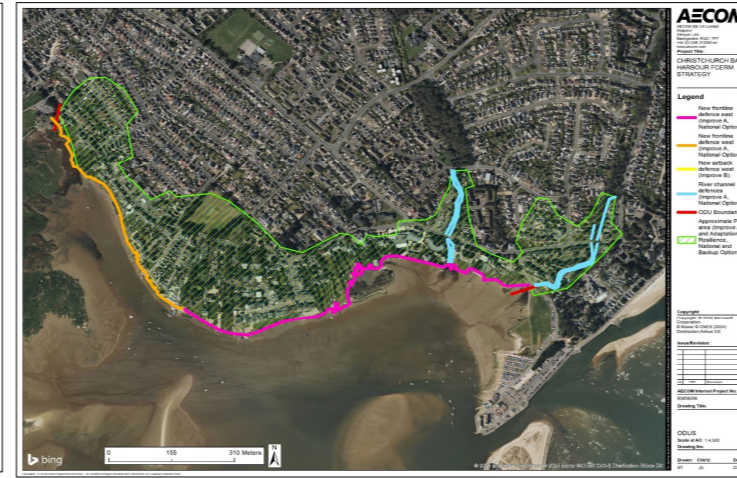


Strategy / Leading Options

- National Option and Backup Option identified
- National Option is Improve (A) that involves raising defences in epoch 3 when the flood risk begins to increase significantly
- In epochs 1 and 2 Improve A also involves PLR measures and quay wall refurbishments as required
- Backup option is Adaptation / Resilience which involves undertaking PLR and maintaining existing defences through refurbishments

Map of Leading Options

- Alignments / PLR areas are indicative and will vary subject to further appraisal



Works required to deliver leading options*

Option	Epoch 1			Epoch 2	Epoch 3
	Years 2025 - 2029	Years 2030 - 2034	Years 2035 - 2039		
National	Identify properties that would benefit from property level resilience measures. Engage with property owners and support property level resilience funding applications / implementation as required. Develop funding strategy for defence refurbishments in epochs 1 and 2. Also consider potential funding for scheme in epoch 3 through this will be highly uncertain.			Ongoing PLR measures. Plan quay wall refurbishments, acquire consenting and funding for refurbishment. Undertake refurbishment of quay wall.	Ongoing PLR measures. Refurbishments.
Backup	Identify properties that would benefit from property level resilience measures. Engage with property owners and support property level resilience funding applications / implementation as required. Develop funding strategy for defence refurbishments.			Ongoing PLR measures. Plan quay wall refurbishments, acquire consenting and funding for refurbishment. Undertake refurbishment of quay wall.	Ongoing maintenance and defence refurbishments and support to property owners for PLR.

*Note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
 *timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£k) - cash															
	Epoch 1 (years)				Epoch 2 (years)				Epoch 3 (years)				Total			
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2079	2080-2084		2085-2089	2090-2104	2105-2114
National	763	23	23	3,056	1,333	23	23	23	23	25,533	46	46	46	46	46	31,030
Backup	761	23	23	3,054	1,331	23	23	23	23	1,254	3,079	4,136	46	3,079	20,540	

*Note that defence refurbishments timing may need to be adjusted if refurbishments are required sooner (to be informed by detailed defence condition assessment)

FCERM GIA funding availability

- Indicative FCERM GIA funding availability calculated for defence upgrade scheme as part of the national option in epoch 3
- Indicative amount of FCERM GIA available for defence upgrade scheme estimated to be in region of £2 million
- See economics report for assumptions when calculating indicative GIA availability (such as baseline year)

Trigger Points

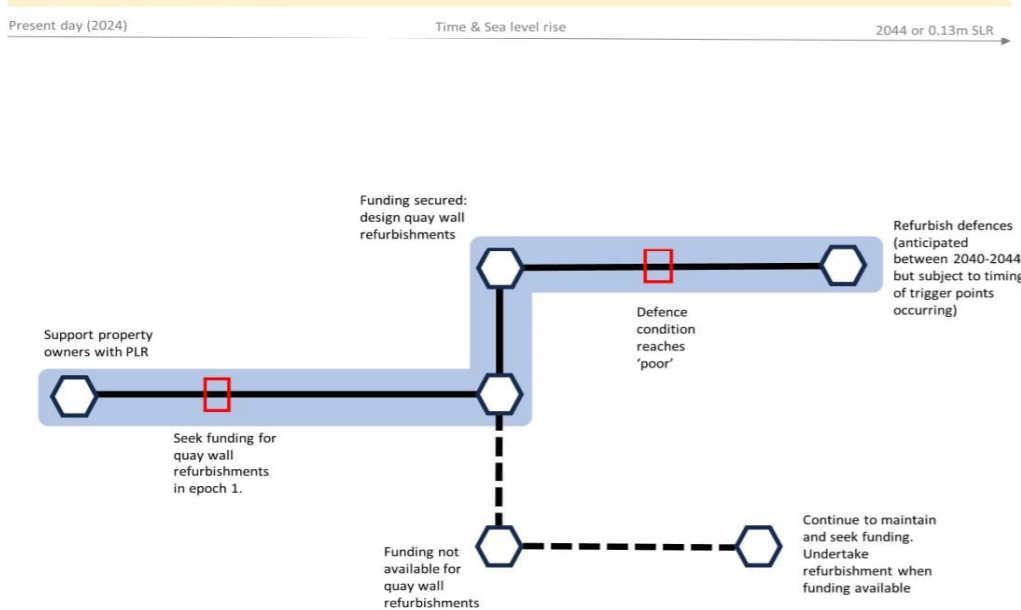
Category	Influence on	Details of key decisions when implementing options	Triggers
Defence condition	Timing of refurbishments for National and Backup Option. Timing of scheme in epoch 3 for National Option	<ul style="list-style-type: none"> - There is currently a quay wall along this frontage that provides stability to the land behind and prevents erosion - The condition for the quay wall is unknown (data not available for the Strategy defence condition assessment). - It is recommended that routine defence condition assessments are undertaken on the structures to determine initial condition status and change over time - Ongoing small scale / patch repair maintenance would be expected to extend the life of these assets - However, when the condition of the defences deteriorates then refurbishments will be required with the National and Backup options. - It is recommended that when the condition reaches a "Poor" rating then the refurbishments are undertaken - In epoch 3 the National Option recommends a new defence scheme. The condition of the quay wall during this time period will also help determine the timing of the scheme in epoch 3 	<ul style="list-style-type: none"> - Condition rating of Poor
Sea level rise	Timing of scheme for National Option	<ul style="list-style-type: none"> - The National Option involves upgrading the defences in epoch 3 when the flood risk is expected to increase significantly and there is a stronger economic case to improve the defences. - The exact timing of the defence scheme with the National Option should be informed by the observed rates of sea level rise and the onset of flood risk in the future (as well as the defence condition). - The UKCP18 sea level rise projections estimate 0.42m of sea level rise by the start of epoch 3 (2074) relative to today. It is therefore recommended that planning / business case development for the scheme begins when observed sea level rise is around 0.42m 	<ul style="list-style-type: none"> - Begin National Option scheme planning / business case development when SLR is 0.42m
Funding	Timing of refurbishments for National Option / Backup Option. Timing of defence improvement scheme with the National Option	<ul style="list-style-type: none"> - The National and Backup Options may have a funding shortfall for the quay wall refurbishment works (unlikely FCERM GIA will cover all of this work) - The Funding Strategy will need to outline how these refurbishments will be funded. If funding is not likely, then the refurbishments could be delayed until funding is secured. However, this will increase the residual risk and localised impacts, such as erosion, could occur in locations where defences fail. - In the long term, there is also expected to be a funding shortfall for the defence scheme as part of the National Option. If funding cannot be secured then the scheme could be delayed until funding can be found. Alternatively the Strategy could implement the Backup option in the long term but there would be increased uncertainty with this due to increased residual risk and deeper flooding and the effectiveness of PLR would reduce. 	<ul style="list-style-type: none"> - Funding availability - Delay refurbishments if funding is not secured

Decision Tree

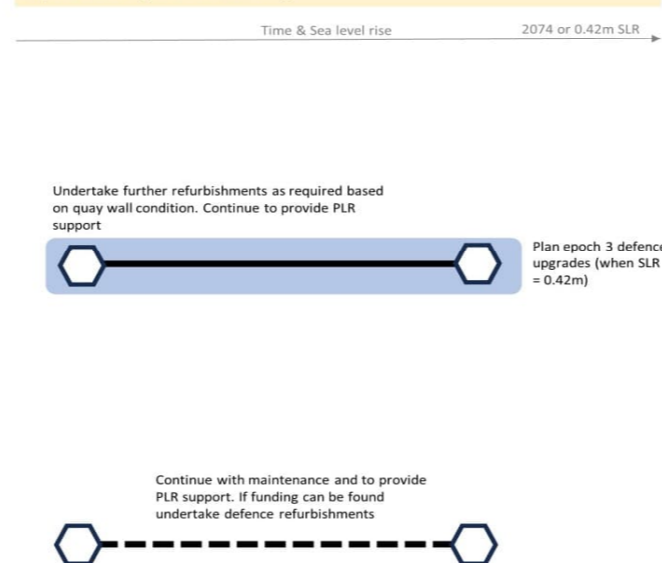


ODU 10: Mundeford Decision tree

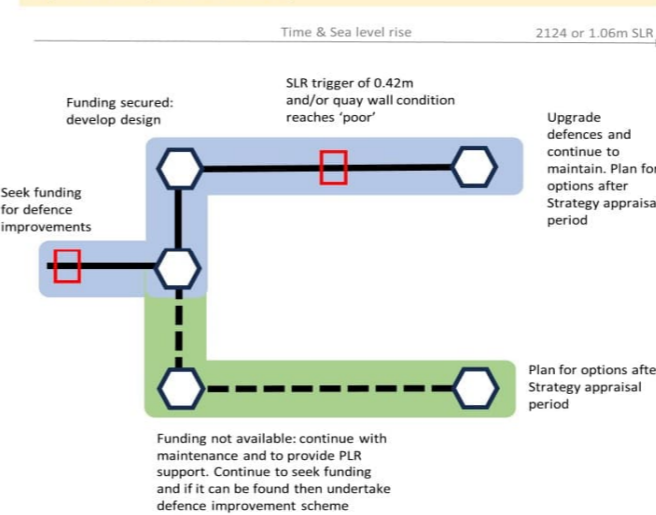
Epoch 1 (2024-2044)



Epoch 2 (2045-2074)



Epoch 3 (2075-2124)



ODU 11 - Mundeford Quay

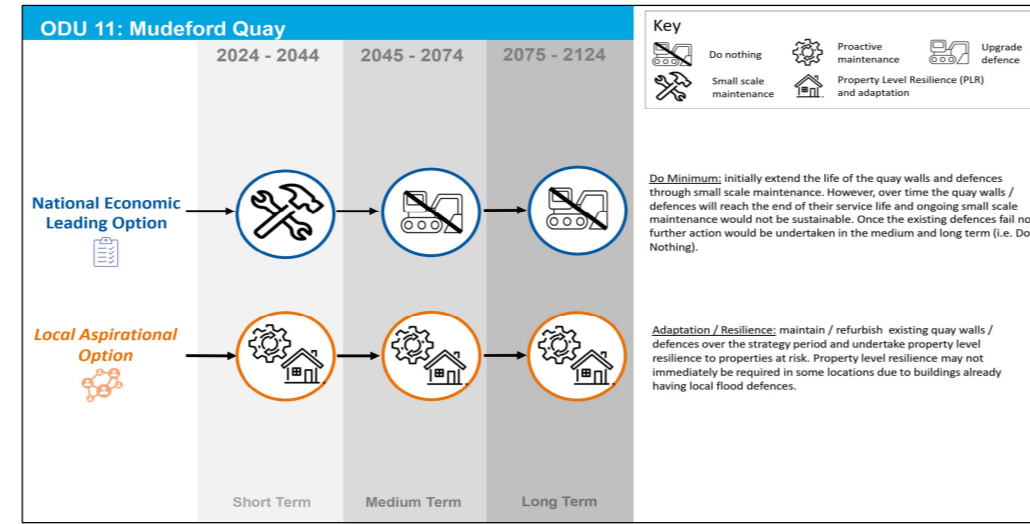
Key features / risks

- Small number of properties at risk from flooding / erosion so therefore there is limited economic benefits on a national basis for defence improvements / maintenance
- Mundeford Quay at risk from flooding currently and depth of flooding expected to increase significantly over next 100 years
- Three properties at risk for a present day 0.5% AEP event, increasing to 12 by 2124
- The quay is a strategically important features for overall morphology of the area, for example, in acting as a training wall for 'the Run' channel
- Uncertain impact on coastal morphology should quay walls around the quay be left to fail in the future
- Key infrastructure passes beneath 'the Run' from the quay



Strategy Leading Options

- National and Local Option identified
- National Option is Do Minimum whereas Local Option is Adaptation / Resilience
- Local Option (Adaptation / Resilience) would involve maintaining the quay walls with refurbishments and manage flood risk on the quay using PLR
- National Option (Do Minimum) would not involve replacing existing defences when they fail and long term morphology is uncertain



Map of Leading Options

- Defence maintenance assumed along existing alignments, however this may vary subject to further appraisal
- PLR requirements to be determined on property by property basis as required



Works required to deliver leading options*

Option	Epoch 1					Epoch 2	Epoch 3
	Years 2025 - 2029	Years 2030 - 2034	Years 2035 - 2039	Years 2040 - 2044	Years 2045 - 2049	Years 2050 - 2054	Years 2055 - 2124
National	No planned works other than small scale patch & repair and ensuring H&S compliance. Review S&P policy to align with the option if this is the option delivered.						
Local	Develop funding strategy for quay wall refurbishments. Undertake defence condition assessments. Undertake historic, aerial investigations to determine contamination status of landfill sites. Identify properties that would benefit from property level resilience measures. Engage with property owners and support property level resilience funding applications / implementation as required.	Begin planning defence refurbishments. Secure funding and consenting for refurbishments. Continue to provide PLR support.	Refurbish existing quay walls. Continue to provide PLR support.	Continue to provide PLR support.	Further refurbishments of existing defences and PLR.	Further refurbishments of existing defences and PLR.	Further refurbishments of existing defences and PLR.

*note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
 *timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£k) - cash														Total	
	Epoch 1 (years)		Epoch 2 (years)						Epoch 3 (years)							
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2084	2085-2094	2095-2104	2105-2114	2115-2124	
National	23	46	91	91	183	183	37	0	0	0	0	0	0	0	0	654
Local	101	11	7,517	11	121	11	11	7,517	11	11	143	7,529	143	7,529	23	30,689

*note that defence refurbishments timing may need to be adjusted if refurbishments are required sooner (to be informed by detailed defence condition assessment)

FCERM GiA funding availability

- FCERM GiA funding unlikely to be available for defence works due to BCR < 1 on national basis. Funding may be available for PLR from separate funding routes

Trigger Points

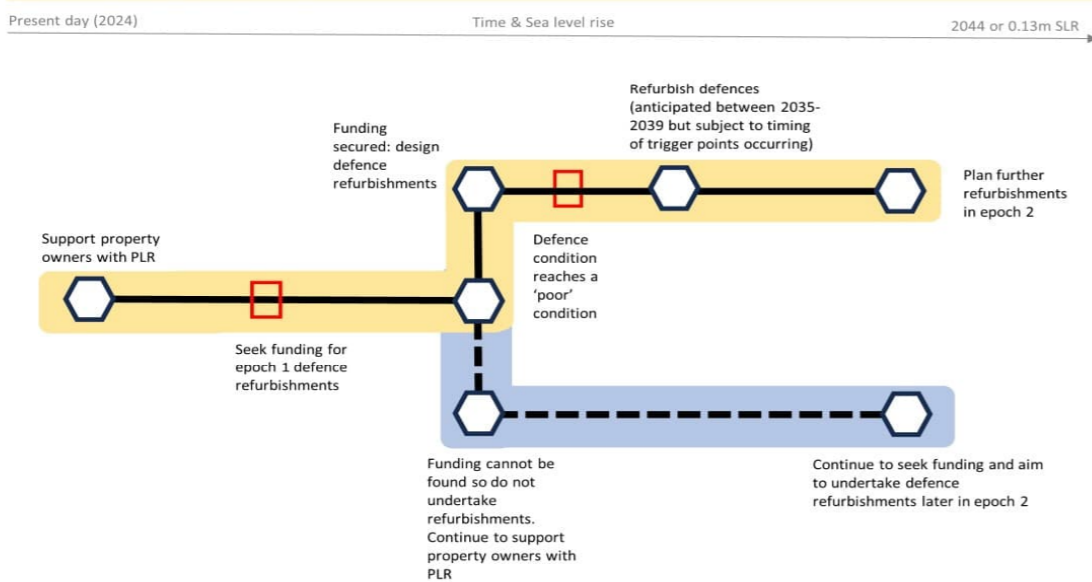
Category	Influence on	Details of key decisions when implementing options	Triggers
Defence condition	Timing of defence refurbishments in Local Option	- If implementing the Local Option: - The existing quay wall around Mundeford Quay was assessed to have a 'Fair' condition in the Strategy defence condition assessment, with an estimated residual life (without maintenance) of 10-15 years - Ongoing small scale / patch repair maintenance would be expected to extend the life of these asset but they are still expected to require a refurbishment during epoch 1 - The timing of a refurbishment will need to be determined based on further detailed condition inspections and may need to be brought forward or delayed accordingly based on the results of the inspections - It is recommended that when the condition reaches a 'Poor' rating then a refurbishment is undertaken	- Condition rating of Poor
Funding	Decision on Local vs National Option and timing of defence refurbishments	- The Local Option will have a funding shortfall for the defence refurbishment works - The Funding Strategy will need to outline how the defence refurbishments will be funded. If funding is not likely, then these refurbishment works could be delayed until the funding is secured or the National Option could be delivered instead. - The residual risk of defence failure will increase if refurbishments are delayed or not undertaken and the consequences of this could be erosion / uncertain morphological change.	- Funding availability - Delay refurbishments or revert to National Option if funding for refurbishments is not secured

Decision Tree

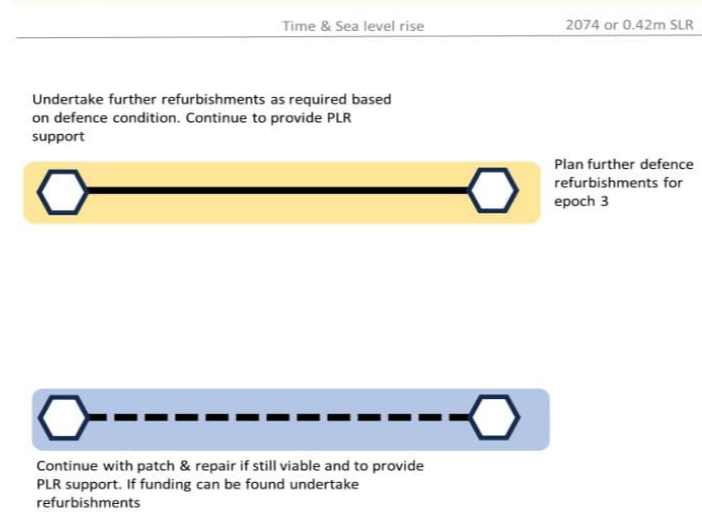


ODU 11: Mundeford Quay Decision tree

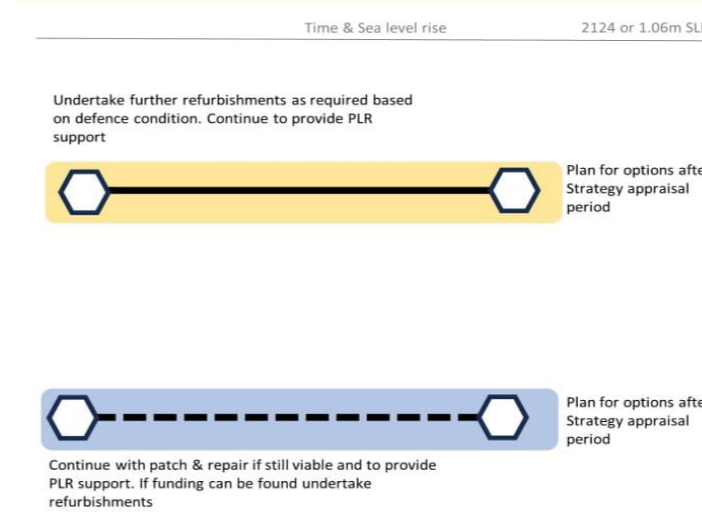
Epoch 1 (2024-2044)



Epoch 2 (2045-2074)



Epoch 3 (2075-2124)



ODU 12 - Avon Beach and Friars Cliff

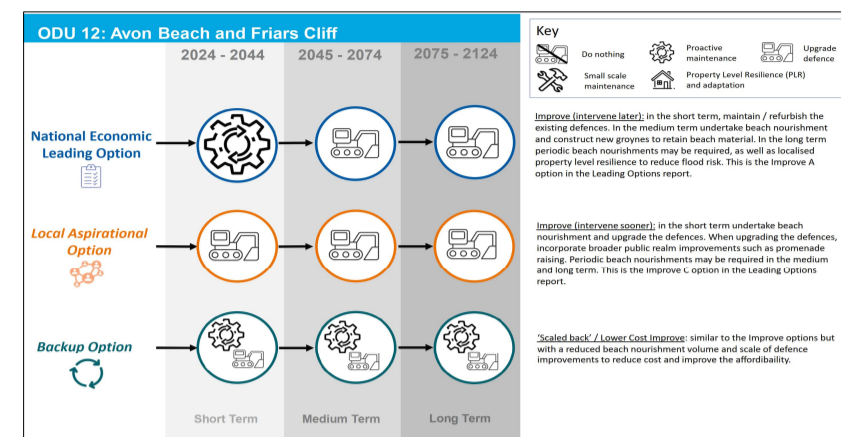
Key features / risks

- Open coast frontage between Marlford Quay and Steamer Point
- Variety of coastal defences including rock groynes, timber groynes, rock revetment and seawall
- Key area for coastal recession / tourism
- Main risk is from coastal erosion, with some minor localised flood risk. Initially erosion risk is low, increasing over time
- Nine properties expected to be at risk from erosion during epoch 1. However, this increases to 172 properties over the next 100 years (cumulative)



Strategy Leading Options

- National (Improve A), Local (Improve C) and Backup Options (scaled back Improve A) identified
- Each of the leading options involve upgrading the defences to provide erosion defence over the Strategy period
- Further work is required after the Strategy to confirm the alignment of the new defences, and this will impact the economic case / timing of interventions
- The National Option (Improve A) involves maintaining / refurbishing defences in epoch 1. Then in epoch 2 upgrade defences / beach nourishment
- The Local Option (Improve C) is the same as the National Option but it involves upgrading defences in epoch 2 and also undertaking public realm enhancements
- The Backup option is the same as the National Option (Improve A) but is 'scaled back' and involves smaller defence upgrades / less beach nourishment material



Map of Leading Options

- Alignments are indicative and will vary subject to further appraisal



Works required to deliver leading options*

Option	Epoch 1						Epoch 2	Epoch 3
	Years 2025 - 2029		Years 2030 - 2034		Years 2035 - 2039			
National	Develop funding strategy Undertake beach management as required	Plan epoch 1 defence refurbishments, acquire consenting and funding for refurbishments and undertake design Undertake beach management as required	Undertake refurbishment of defences Undertake beach management as required	Business case development for capital scheme to improve defences and beach nourishment, and public realm enhancements Acquire consent and funding for this scheme and undertake design Undertake beach management as required	Undertake capital scheme to upgrade defences and beach nourishment If funding allows include works to improve public realm	Undertake beach management as required	Capital scheme to improve defences and beach nourishment	Ongoing maintenance and beach management
Local	Develop funding strategy Undertake beach management as required	Plan epoch 1 defence refurbishments, acquire consenting and funding for refurbishments and undertake design Undertake beach management as required	Undertake refurbishment of defences Undertake beach management as required	Business case development for capital scheme to improve defences and beach nourishment This would be a 'scaled back' version of the defence upgrades and a smaller beach nourishment scheme compared to the National Option Acquire consent and funding for the scheme and undertake design Undertake beach management as required	Undertake beach management as required	Capital scheme to improve defences and beach nourishment	Ongoing maintenance and beach management	
Backup	Develop funding strategy Undertake beach management as required	Plan epoch 1 defence refurbishments, acquire consenting and funding for refurbishments and undertake design Undertake beach management as required	Undertake refurbishment of defences Undertake beach management as required	Business case development for capital scheme to improve defences and beach nourishment This would be a 'scaled back' version of the defence upgrades and a smaller beach nourishment scheme compared to the National Option Acquire consent and funding for the scheme and undertake design Undertake beach management as required	Undertake beach management as required	Capital scheme to improve defences and beach nourishment	Ongoing maintenance and beach management	

*Note: not shown in table above, but monitoring and small scale / patchy regular maintenance on existing defences and assets should be undertaken annually / as required
*Timing of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£k) - cash															
	Epoch 1 (years)			Epoch 2 (years)						Epoch 3 (years)						Total
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2084	2085-2094	2095-2104	2105-2114	2115-2124	
National	49	49	3,499	49	49	49	49	49	49	2,097	213	97	2,143	97	2,143	20,373
Local	49	49	18,216	49	49	49	49	49	49	2,097	256	140	2,188	140	2,188	25,617

FCERM GiA funding availability

- Indicative FCERM GiA funding availability calculated for defence upgrade scheme as part of the national option epoch 2
- Indicative amount of FCERM GiA available for defence upgrade scheme estimated to be in region of £1.4 million
- See economics report for assumptions when calculating indicative GiA availability (such as baseline year)

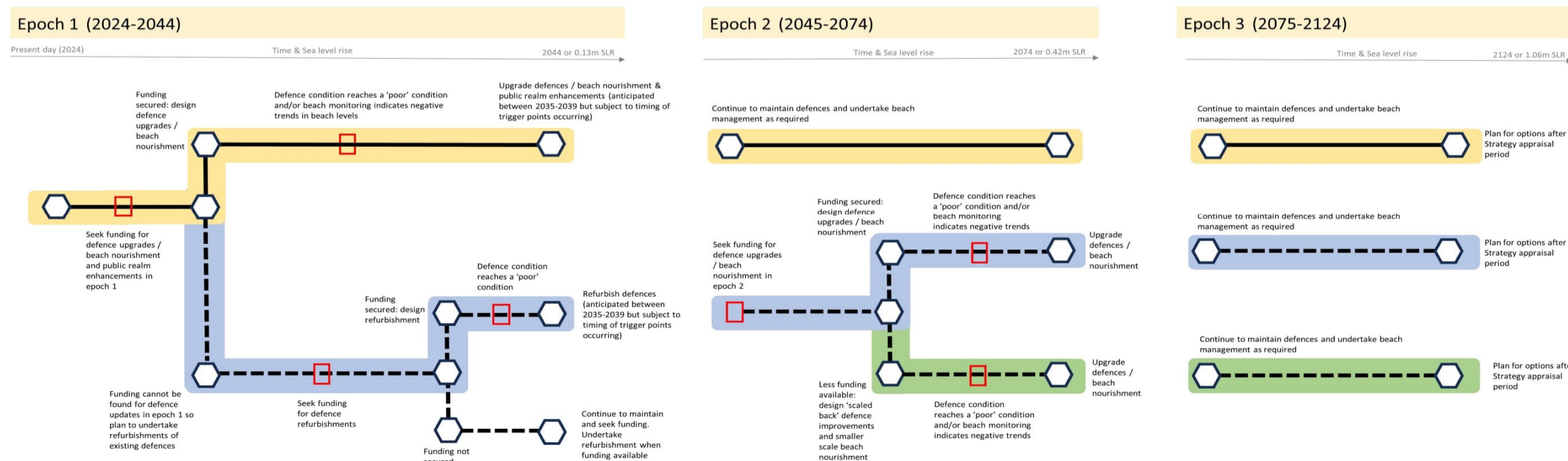
Trigger Points

Category	Influence on	Details of key decisions when implementing options	Triggers
Beach monitoring	Timing of defence upgrades / beach nourishment in Leading Options	- The beach is a key component of the defence system in this location and the existing defences (groynes) currently help control beach levels - There is a risk that the beach profile could change over time in response to storm / sea level rise which could reduce the effectiveness of the defence system - It is recommended that the beach profiles in ODU 12 continue to be monitored on a regular basis (i.e. every 6 months) to identify any trends in the beach profile movement. - If the beach profile trends indicate that the beach profile is lowering beyond the typical range then this could be a trigger for upgrading / modifying the existing defences to help retain more beach material and undertaking a beach nourishment scheme. - A long term record of monitoring is required to enable long term significant trends to be identified relative to typical seasonal variations	- A consistent trend in beach profile change (not typical seasonal changes)
Defence condition	Timing of defence refurbishments and defence upgrades in Leading Options	- The condition of the defences in ODU 12 varies but are typically 'fair'. There are some defences in a 'poor' or 'good' condition. - The condition of the defences can also inform the timing of refurbishments and defence upgrades - For defence refurbishments it is recommended that refurbishments are undertaken once defences reach a 'poor' condition - Similarly, if a defence upgrade scheme is scheduled within several years and the defences reach a 'poor' condition then this could also be a trigger for undertaking the scheme sooner. - It is recommended that detailed defence condition surveys are undertaken on a regular basis to inform the defence condition and changes over time.	- Condition rating of Poor
Funding	Decision on Local vs National vs Backup Option	- The National, Local and Backup Options will have a funding shortfall (i.e. FCERM GiA will not cover the full cost) - The Funding Strategy will need to outline how the scheme / refurbishments will be funded. - If funding for undertaking the defence improvements and beach nourishment for the Local Option in epoch 1 is not available, then the Strategy could revert to the National Option and refurbish existing defences instead during epoch 1 (with the aspiration to then undertake the defence improvements in epoch 2) - If funding for the defence improvements and beach nourishment for the National Option in epoch 2 is not available, then the Strategy could revert to the Backup option and reduce the scale of defence improvements / beach nourishment to reduce the overall cost. - If funding is not likely for the refurbishments, then the refurbishments / scheme could be delayed until the funding is secured. However, delaying the refurbishments / scheme will increase the residual risk of erosion and damage to properties prior to the works being completed.	- Funding availability - Revert to National Option if funding not available for scheme in epoch 1 - Revert to Backup option if not enough funding is available in medium term

Decision Tree



ODU 12: Avon Beach and Friars Cliff Decision tree



ODU 15 - Barton on Sea to Hordle Cliff

Key features / risks

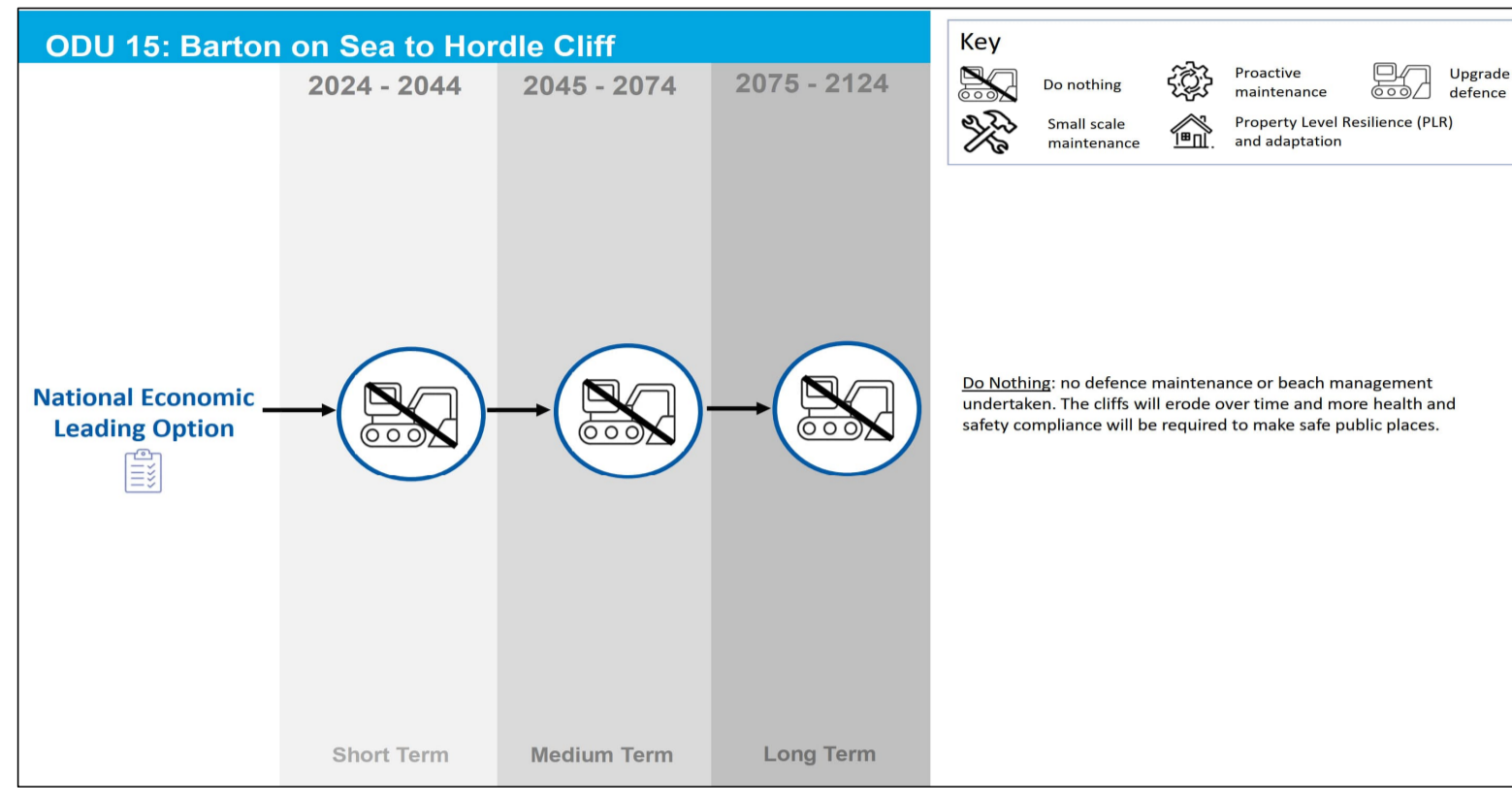
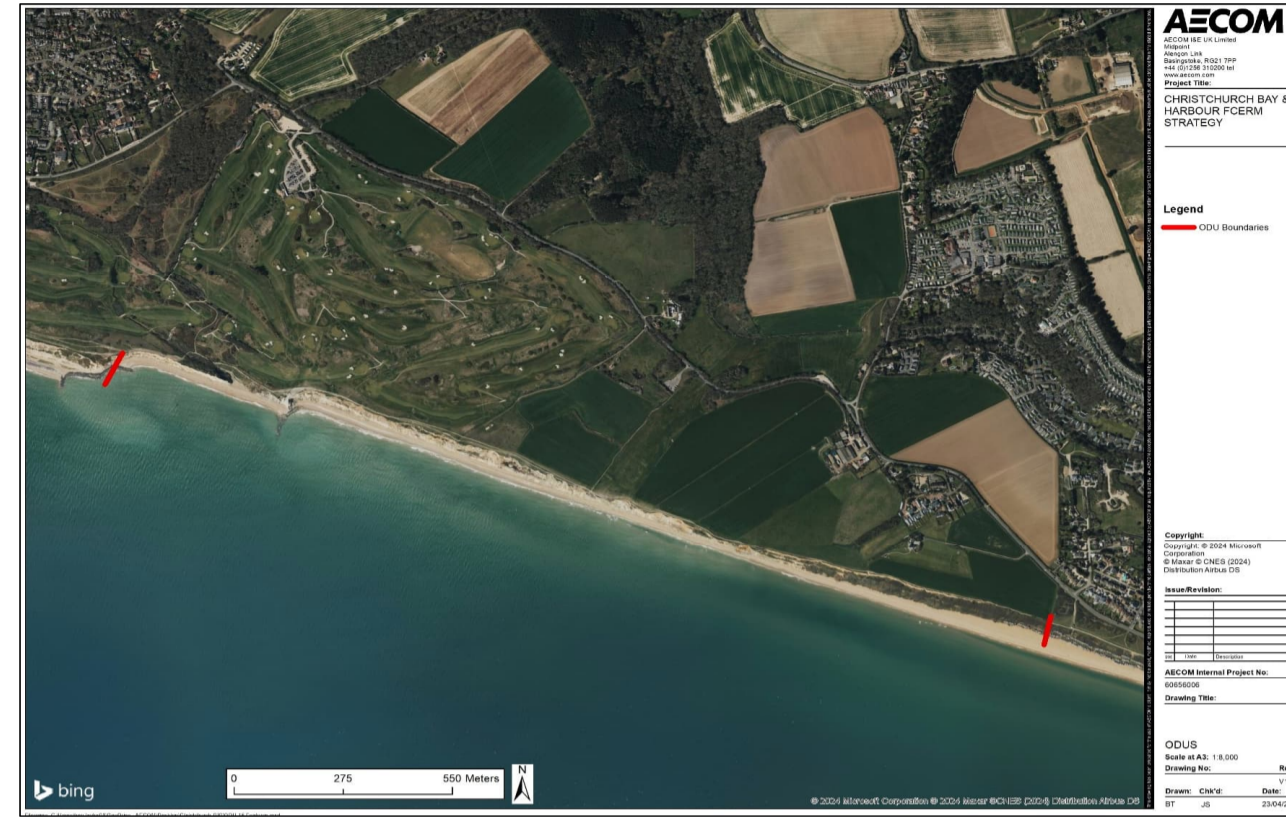
- Undefended open coast frontage between Barton on Sea and Hordle Cliff
- No properties or other assets at risk until epoch 3 (only 1 property at risk in epoch 3)

Strategy Leading Options

- National option is Do Nothing
- Allow natural processes to occur, supporting the features of the environmental designations found in this area

Map of Leading Options

- No map of Leading Options provided as Do Nothing does not include any interventions



Works required to deliver leading options*

Option	Epoch 1					Epoch 2	Epoch 3
	Years 2025 - 2029	Years 2030 - 2034	Years 2035 - 2039	Years 2040 - 2044	Years 2045-2074	Years 2075-2124	
National	No defence maintenance or beach management undertaken. Undertake health and safety activities following cliff erosion events to make safe public spaces						

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£k) - cash															
	Epoch 1 (years)				Epoch 2 (years)					Epoch 3 (years)						Total
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2084	2085-2094	2095-2104	2105-2114	2115-2124	
National	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FCERM GiA funding availability

- Not applicable with Do Nothing option

Trigger Points

Category	Influence on	Details of key decisions when implementing options	Triggers
NA	NA	NA	

Decision Tree

- Not applicable with Do Nothing option

ODU 16 - Cliff Road

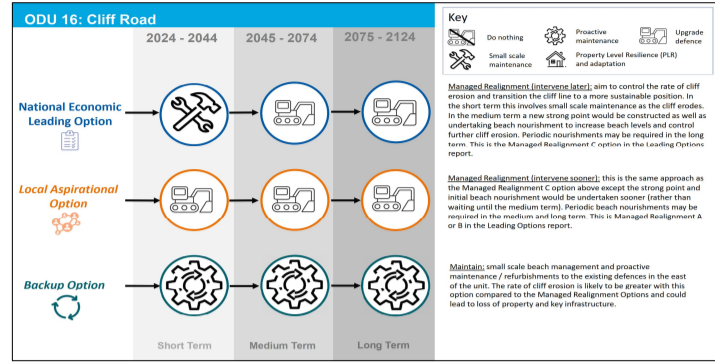
Key features / risks

- Open coast frontage between the beach huts and the western end of the defences at Cliff Cliff, used extensively for recreation / amenity
- Most of the cliff is underlain and the beach floor of the cliffs provides the main protection to the cliff toe
- However, at the eastern end of the cliff there is a wall and groynes that provide local protection
- Main risk is from coastal erosion. Beach huts at end of cliff corridor, there is a risk of erosion to the cliff and main road
- Also risk to public amenity features, toilets, car parking and beach access
- Over the next 100 years 233 properties at risk of erosion, but majority of the properties at risk are expected during epoch 3
- Cliff designated as SSSI due to geological importance
- Dominant sediment transport direction is from west to east



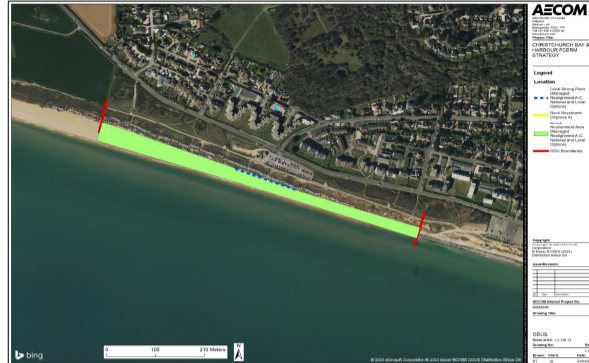
Strategy Leading Options

- National (Managed Realignment C), Local (Managed Realignment A/B) and Backup Options (Mantain) identified
- The National Option (Managed Realignment C) involves constructing a local strong point and undertaking beach nourishment in epoch 2. The aim will be to let erosion of the cliff toe occur and cliff toe to reach more sustainable position. However, with the defence interventions this will be done in a controlled manner to avoid property loss / loss of road in the future
- The Local Option (Managed Realignment A/B) as the same as the National Option but it involves undertaking the beach nourishment and construction of local strong point sooner (in other epoch 1 or the start of epoch 2)
- The Backup option involves maintenance of existing defences and beach recycling. However, in the long term the erosion risk is likely to be greater than the National / Local options and property loss could occur
- Further work is required after the Strategy to confirm the alignment of the new defences, and this will impact the economic case / timing of interventions



Map of Leading Options

- Alignments are indicative and will vary subject to further appraisal



Works required to deliver leading options*

Option	Years 2020 - 2029	Years 2030 - 2034	Epoch 1	Years 2035 - 2039	Years 2040 - 2044	Epoch 2	Epoch 3
National	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.
Local Managed Realignment A (shown for reference)	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.
Backup	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.	Design and construction of local strong point / beach nourishment as required. The cliff will continue to erode to support beach hut owners as required.

*Note: not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required
 *range of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Epoch 1 (years)												Epoch 2 (years)				Total
	2020-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2079	2080-2084	2085-2089	2090-2094	2105-2114	2115-2124	
National	98	98	193	193	348	264	264	10,237	127	137	214	1,940	274	1,940	271	19,514	
Local	98	1,660	137	137	137	137	137	137	137	1,940	274	1,940	274	1,940	271	12,250	
Backup	98	491	98	98	348	264	741	264	348	264	1,000	615	612	1,000	615	6,862	

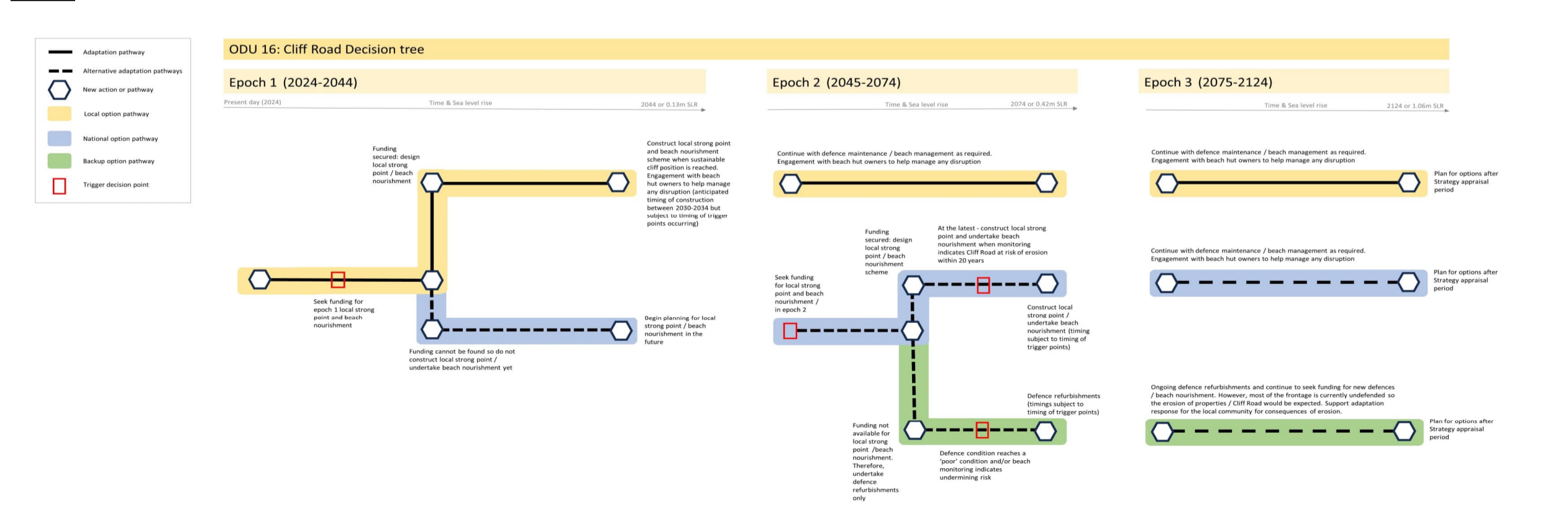
FCERM GIA funding availability

- Indicative FCERM GIA funding availability calculated for scheme as part of the local option in epoch 1 and the national option in epoch 2
- Indicative amount of FCERM GIA available for defence scheme estimated to be in region of £1.3 million (local option scheme) to £1.9 million (national option scheme)
- *See economic report for assumptions when calculating indicative GIA availability (such as baseline year)

Trigger Points

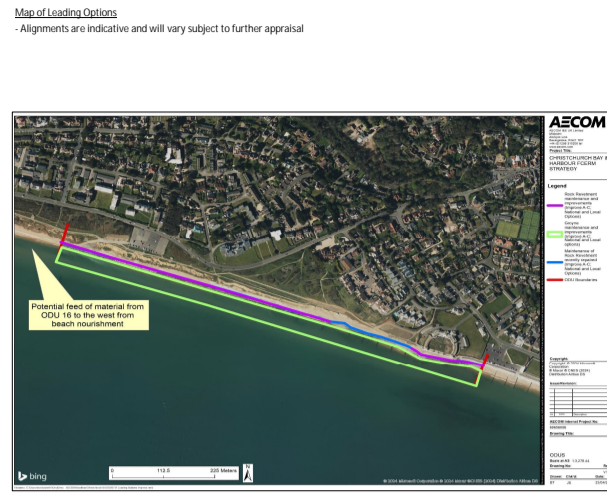
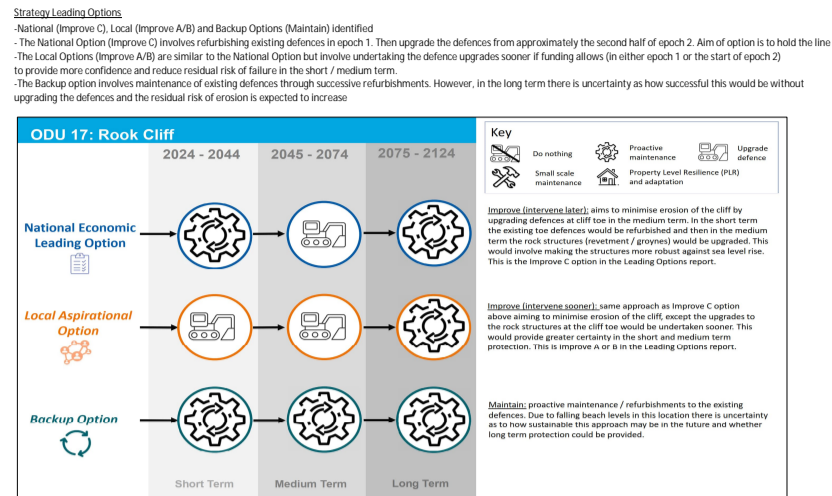
Category	Influence on	Details of key decisions when implementation options	Triggers
Beach nourishment / cliff erosion	Timing of local strong point construction / beach nourishment in National / Local Options	<ul style="list-style-type: none"> The beach is a key component of the defence system in this location and it helps to control rates of cliff erosion. Where the beach is narrower it provides less protection to the cliff toe Over time there is a risk that the beach profile could change further in response to storms / sea level rise which could reduce the effectiveness of the defence system further It is recommended that rates of cliff erosion and the beach profile in ODU 16 continue to be monitored on a regular basis (i.e. every 6 months and in response to storms). This will help to identify any long term trends. The National / Local options aim to allow some erosion of the cliff to occur in the future to create more space for a wider beach. However, the options will ensure that this erosion will be in a controlled manner with the aim of stopping erosion reaching Cliff Road and the properties behind it. The cliff erosion / beach profile trends should therefore be monitored so that the local strong point / beach nourishment scheme as part of these options can be timed appropriately so that the roadway / properties do not become at risk. The timing of the local strong point / beach nourishment will need to be carefully considered so that a buffer zone of land is retained seaward of Cliff Road. This will ensure that any further erosion in the future (after the scheme is in place) does not threaten the Road and properties It is recommended that the trigger for undertaking the local strong point / beach nourishment is when the cliff toe reaches a distance from Cliff Road that puts the road at risk from erosion within a 20 year period. This will need to consider the rate of erosion that is occurring and beach profile changes based on monitoring results, as well as the distance between the cliff top and Cliff Road. The local strong point / beach nourishment could be undertaken sooner (for example in epoch 1 if funding allows), but it should be undertaken no later than the trigger level in order to retain a buffer zone of open space at the cliff top after the scheme is constructed. A long term record of beach profile / cliff erosion monitoring is required to enable long term significant trends to be identified relative to typical seasonal variations. This will also be important after the local strong point / beach nourishment is undertaken because the cliff / beach may continue to erode and the monitoring will inform future interventions to help manage this process. 	Cliff erosion and beach profile trends that threaten Cliff Road & properties within 20 years (i.e. need to intervene before the risk is projected to be at risk within a 20 year period of time)
Defence condition	Timing of defence refurbishments and defence upgrades	<ul style="list-style-type: none"> The condition of the defences in ODU 16 varies but are typically 'fair' or 'poor' and are sensitive to presence and supply of beach material to protect the toe The condition of the defences can inform the timing of refurbishments and defence upgrades For defence refurbishments it is recommended that refurbishments are undertaken once defences reach a 'poor' condition Similarly, if a defence upgrade scheme is scheduled within several years and the defences reach a 'poor' condition then this could also be a trigger for undertaking the scheme sooner. It is recommended that detailed defence condition surveys are undertaken on a regular basis to inform the defence condition and changes over time. 	Condition rating of Poor
Funding	Decision on Local or National or Backup Option	<ul style="list-style-type: none"> The timing of the scheme for the local and National Options should primarily be determined by the beach profile / cliff erosion trigger threshold. However if it is recognised that funding availability may delay the construction of the scheme if funding is not available. If the scheme is delayed, then there is a risk of an increased cost for the scheme as more works may be required to stabilise the cliff position if it gets closer to Cliff Road The National / Local and Backup Options will have a funding shortfall as FCERM GIA will not cover the full cost The Funding Strategy will need to outline how the scheme / refurbishments will be funded Funding for undertaking the local strong point / beach nourishment for Managed Realignment A (Local option) in epoch 1 is not available. Then the Strategy could revert to the undertaking these improvements at later date - i.e. either Managed Realignment B (local option) or Managed Realignment C (National Option). The exact timing will need to be determined by the erosion risk / beach profile trends. There is a risk that the longer the defence scheme is left, the greater the cost of the scheme as more works may be needed to stabilise the cliff position Funding for the local strong point / beach nourishment as part of the Local / National options is not available, then the Strategy could revert to the Backup option (Mantain) and only undertake defence refurbishments However, this would likely result in increased risk of erosion to Cliff Road / properties and adaptation plans would be required to manage the consequences of this erosion 	Funding availability Underpinning the local strong point / beach nourishment scheme at a later date if funding is not fully to be immediately available Revert to Backup option if it is unlikely that any funding can be found for the local strong point / beach nourishment in the future

Decision Tree



ODU 17 - Rook Cliff

Key features / risks
 Open coast frontage between the start of the Rook Cliff defences and the Hunt Road West car park (including the White House)
 Variety of coastal defences including a concrete seawall fronted by a rock revetment, timber and rock groynes
 Recent emergency work completed at Westover to stabilise the defences following a failure. Undermining risk with falling beach levels
 Main risk is from coastal erosion, with 20' properties expected to be at risk over the next 100 years (cumulative)
 Car parks and open space between the defence line and the properties at risk



Works required to deliver leading options*

Option	Epoch 1				Epoch 2	Epoch 3
	Years 2025 - 2029	Years 2030 - 2034	Years 2035 - 2039	Years 2040 - 2044		
National	Service leading strategy: Sea defences refurbishment, repair concrete and landing structures, and portable design. Review RFP policy to align with the option if this is the option delivered.	Understand condition of defences	Understand defences maintenance as required	High planning for defence upgrade and beach nourishment in epoch 2 (only red spots). Intensive defences maintenance as required	Review cost effectiveness, funding and economic, design and construction of defence upgrade scheme in epoch 2	Defence refurbishment / refurbishments as required
Local (Improve A/B shown for reference)	Service leading strategy: Sea defences upgrade and develop business case as an independent commercial scheme. Review RFP policy to align with the option if this is the option delivered.	Design defences upgrade. Construct scheme	Understand defences maintenance as required		Defence refurbishment / refurbishments as required	Defence refurbishment / refurbishments as required
Backup	Service leading strategy: Fund defences upgrade in the future to reduce the risk of failure. Review RFP policy to align with the option if this is the option delivered.	Understand condition of defences	Understand defences maintenance as required		Defence refurbishment / refurbishments as required. Defences upgrade may be required to increase risk of failure. Defences upgrade may be required to increase risk of failure. Defences upgrade may be required to increase risk of failure.	Defence refurbishment / refurbishments as required. Defences upgrade may be required to increase risk of failure. Defences upgrade may be required to increase risk of failure. Defences upgrade may be required to increase risk of failure.

*Note: Not shown in table above, but monitoring and small scale / patch repair maintenance on existing defences and assets should be undertaken annually / as required

*Timings of works subject to trigger points such as funding and condition of existing defences

Cost profile for capital works and maintenance (not including pre-business case / support work)

Leading Option	Indicative option cost (£M - cash)														
	Epoch 1 (years)			Epoch 2 (years)			Epoch 3 (years)			Total					
	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	2060-2064	2065-2069	2070-2074	2075-2084	2085-2094	2095-2114	2115-2124	
National	50	3,830	50	50	50	50	17,521	50	50	50	100	100	100	100	24,985
Local	50	13,675	50	50	50	50	50	50	50	50	2,828	100	100	100	17,353
Backup	50	2,733	50	1,121	50	50	50	50	50	50	2,828	1,121	100	100	13,298

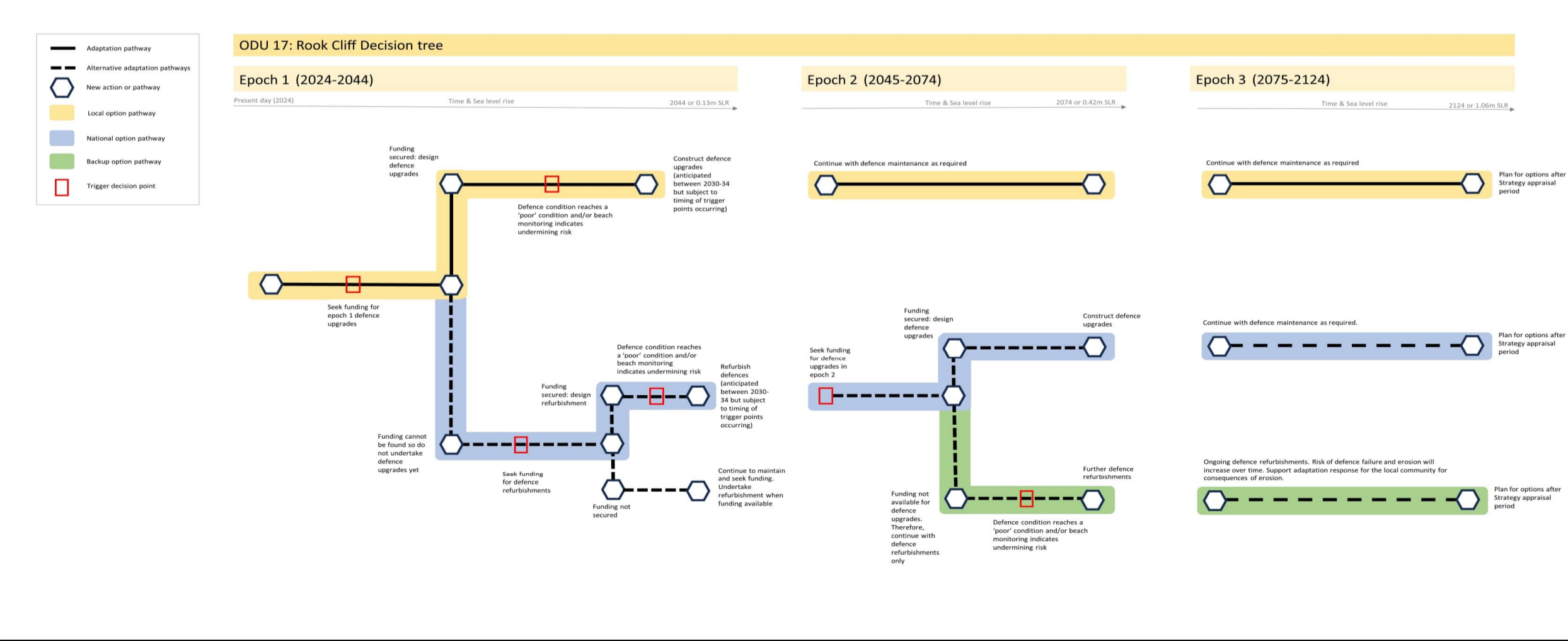
FCERM GIA funding availability

Indicative FCERM GIA funding availability calculated for scheme as part of the local option in epoch 1, and the national option in epoch 2
 Indicative amount of FCERM GIA available for defence scheme estimated to be in region of £2.4 million (local option scheme) to £3.4 million (national option scheme)
 See economics report for assumptions when calculating indicative GIA availability (such as baseline year)

Trigger Points

Category	Influence on	Details of key decisions when implementing option	Trigger
Beach monitoring	Timing of defence refurbishments and defence upgrades	The beach is a key component of the defence system as it helps to defend the toe of the defences. When the beach level falls, and the toe of the defences becomes exposed, it can increase the risk of the defences failing. This strategy has a risk investment along its full length and undermining risk can cause risks in the lower section of the rock slope to slump or collapse into the ocean zone, decreasing the defence performance. It is recommended that the beach profiles in ODU 17 continue to be monitored on a regular basis (i.e. every 6 months and in response to storms). This will help to identify any trends in beach levels and identify undermining risk. If a trend in beach levels develops which increases undermining risk and threatens the integrity of the defences then this should be a trigger for undertaking defence refurbishments to rebuild the rock slope or upgrades that could improve the toe protection.	Beach profile trends that increase undermining risk and threaten defence integrity
Defence condition	Timing of defence refurbishments and defence upgrades	The condition of the defences in ODU 17 varies between 'very good' and 'poor'. The condition of the defences can inform the timing of refurbishments and defence upgrades. For defence refurbishments it is recommended that refurbishments are undertaken once defences reach a 'poor' condition. Similarly, if a defence upgrade scheme is scheduled within several years and the defences reach a 'poor' condition then this could also be a trigger for undertaking the scheme sooner. It is recommended that detailed defence condition surveys are undertaken on a regular basis to inform the defence condition and changes over time.	Condition rating of Poor
Funding	Decision on Local vs National or Backup Option	The National, Local and Backup Options will have a funding shortfall (i.e. FCERM GIA will not cover the full cost) and if funding cannot be secured then this could delay the timing of defence upgrades and refurbishments. The funding strategy will need to outline how the scheme / refurbishments will be funded. If funding for undertaking the defence upgrade for Improve A (local option) in epoch 1 is not available, then the Strategy could revert to the Backup option (Maintain) and only undertake defence refurbishments. If funding for the defence upgrade as part of the Local / National option is not available, then the Strategy could revert to the Backup option (Maintain) and only undertake defence refurbishments. However, this could result in increased risk of erosion in the future as it is unclear how long existing defences could be refurbished for without compromising performance. Adaptation plans would be required to manage the consequences of any erosion that occurs with this option.	Funding availability - Undertaking the defence upgrade scheme if a later date of funding is not likely to be immediately available (revert to Backup option if it is unlikely that any funding can be found for the defence upgrades in the future)

Decision Tree



Cabinet- 4 September 2024

Strategic Risk Register

Purpose	For Decision
Classification	Public
Executive Summary	The Strategic Risk Register (Appendix 1), now included within this report contains the significant risks, as identified by senior and executive council officers in consultation with the Portfolio Holders, in the Council achieving the priorities set out in the 'For people, place, prosperity Corporate Plan 2024-28'
Recommendation	Cabinet are asked to recommend Council adopt the Strategic Risk Register.
Reasons for recommendation	Risk Management Policy 2022 confirms the role of Cabinet is to endorse the content of the Strategic Risk Register.
Wards	All
Portfolio Holders	Councillor Jill Cleary – Leader / All
Strategic Director	Alan Bethune – Strategic Director Corporate Resources S151 and Transformation
Officer Contact	James Clarke Insurance and Risk Officer 023 8028 5002 James.Clarke@nfdc.gov.uk

Introduction and background

1. Risk management aims to identify the risks that may impact on the Council achieving its objectives. Its purpose is to evaluate, design and implement effective measures to reduce both the likelihood and potential impact of these risks occurring.
2. The Council has a statutory responsibility to have in place arrangements for managing risks under the Accounts and Audit Regulations; which require a sound system of internal control, facilitates the effective exercise of the body's functions and includes arrangements for the management of risk. As such it features

strongly in the Council's Local Code of Practice for Corporate Governance and is one of the primary assurance strands in the Annual Governance Statement, which places significant reliance on a robust risk management framework.

Strategic Risk Register

3. The Strategic Risk Register (Appendix 1) outlines the most significant overarching risks to achieving the current Corporate Plan and details the proposed measures to address these risks effectively. The Strategic Risk Register (Appendix 1) captures the most significant cross cutting risks to the delivery of the current Corporate Plan and the proposed actions to mitigate these risks.
4. These risks have been identified through collaboration between senior and executive council officers and Portfolio Holders to ensure a unified approach in identifying and recording these risks.
5. The strategic risk register covers a total of eight significant risks. The updated register in Appendix 1 provides a comprehensive description of the actions needed to adequately control residual risks. Some actions are ongoing, while others have specific completion points.
6. In the narrative detailing the current circumstances and risk controls, each paragraph is labelled with a corresponding letter that matches the narrative in the Risk Control section. For instance, a paragraph labelled 'A' aligns with a reference 'A1' in the Risk Control column, maintaining this lettering system followed by sequential numbers.
7. The column titled 'Further control to mitigate risk' suggests additional measures to enhance the existing risk controls.
8. The term 'Action Owner,' indicates the responsible job title for taking on each action.
9. The below table provides an explanation to the coding used for the CPTC Column (Corporate Plan Priority Theme Code). This ensures each action is geared towards the relevant themes within the Corporate Plan.

People Priorities	Code
Priority 1: Helping those in our community with the greatest need	PE1
Priority 2: Empowering our residents to live healthy, connected and fulfilling lives	PE2
Priority 3: Meeting housing needs	PE3
Place Priorities	
Priority 1: Shaping our place now and for future generation	PL1
Priority 2: Protecting our climate, coast, and natural world	PL2
Priority 3: Caring for our facilities, neighbourhoods, and open spaces in a modern & responsive way	PL3
Prosperity Priorities Code	
Priority 1: Maximising the benefits of inclusive economic growth and investment	PR1
Priority 2: Supporting our high-quality business base and economic centres to thrive and grow	PR2
Priority 3: Championing skills and access to job opportunities	PR3

Corporate plan priorities

10. The recommendations are designed to enhance the successful delivery of all corporate plan priorities by proposing risk mitigation strategies that address cross-cutting vulnerabilities facing the Council.

Options appraisal

11. A strategic risk register is essential for the council to effectively identify, assess, and manage risks. Without this register, we may face considerable operational, financial, and reputational repercussions, underscoring the importance of prioritising and managing risks appropriately.

Consultation undertaken

12. Service managers and the Executive Management Team (EMT) conducted an initial review of the Strategic Risk Register. It was determined that specific columns require updates to align with the recent recommendations provided by the internal audit. Additionally, a proposal was made to replace individual names in the action owners' section with job titles to enhance clarity and reference efficiency.
13. The Audit Committee contributed valuable feedback regarding the recent global ICT outage, which has been integrated into Strategic Risk 3A. This includes revisions to Risk Control A14 and the revision of Further control to mitigate risk, No 9. Moreover, input related to Strategic Risk 7 has been addressed, resulting in enhancements to

Current Circumstance A, as well as corresponding updates to Risk Controls A4 and A5.

Financial and resource implications

14. There are none arising directly from this report, although strong risk management and a solid understanding of risk helps to support robust financial management.

Legal implications

15. There are no direct legal implications arising from this report.

Risk assessment

16. The Strategic Risk Register is evidence of the risk assessment for the cross-cutting risks.

Environmental / Climate and nature implications

17. There are no direct environmental or climate and nature implications arising from this report.

Equalities implications

18. There are no direct equality implications arising from this report.

Crime and disorder implications

19. There are no direct crime and disorder implications arising from this report.

Data protection / Information governance / ICT implications

20. There are no direct Data protection / Information governance / ICT implications arising from this report.

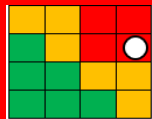
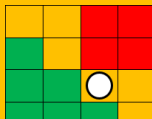
Appendices

Background Papers:

Appendix 1 – Strategic Risk Register N/A.

Strategic Risk Register 2024 - 2028 • June 2024

1. Empower our communities to enhance quality of life

Inherent Risk Score	Current circumstance	Risk Control	Residual Risk Score	Further control to mitigate risk	Action Owner	CPTC
<p>Likelihood 3 x Impact 4 = High 12</p> 	A. Communities continue to experience lingering impacts of elevated inflation rates, despite a recent decrease and steadying. The slow adjustment of pricing is expected to prolong the pressure on the cost of living, further straining local businesses.	A1.Targeted funding streams and support for voluntary and community sectors.	<p>Likelihood 2 x Impact 3 = Medium 6</p> 	1. Allocate resource to support Corporate Plan priorities.	Strategic Director Corporate Resources S151 and Transformation	PR1
	B. Communities are impacted through a shortage of housing including affordable housing Supply being delivered within the District.	A2. Engagement in discussions of fundamental activities such as Solent Freeport and County Deals.		2. Continue to work in partnership for example with the Solent Freeport and with other public sector partners to explore new and existing opportunities to deliver to residents and businesses.	Chief Executive	PL1
	C. Communities can also require support during significant adverse environmental events.	A3. Close working partnerships with key stakeholders such as the Community Safety Partnership and the Skills Advisory Group.		3. Continued support to the Cost of Living Steering Group is provided, bringing a multi-agency approach to tackling issues affecting the most vulnerable in the community, working alongside the Local Partnership Campaign Manager to explore and promote further support to household.	Strategic Director Corporate Resources S151 and Transformation	PL1
	D. The Council needs to do more to support communities with enhanced digital channels for transacting and communicating with the Council.	A4.Collaborative working with key partners through the Cost of Living Steering Group to implement a Poverty Action Plan.		4. Continuing to explore all housing enabling avenues across planning and housing.	Assistant Director Housing and Assistant Director Place Development	PE3
	E. There will also be some challenges around the delivery of the Freeport and in the Analogue to digital switchover by 2025.	A5. Regular engagement with the voluntary sector		5. Roll-out Digital Strategy prioritising customer needs.	Assistant Director Transformation	PE1
		A6. Participation on the board and its sub-committees of Solent Freeport Consortium Limited, ensuring collaborative working and shared goal achievement to advance the economic, social and environmental well-being of the District.				


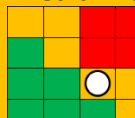
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		<p>B1. Effectively review and apply the Council's Local Plan, including active monitoring of the implementation, while proactively working with developers to provide enabling infrastructure and continuously reviewing the Local Plan.</p> <p>B2. The Council's Housing Revenue Account is actively seeking opportunities to bring forward additional affordable homes within the District, under Council ownership.</p> <p>C1. The ability for the Council to operate in adverse environmental conditions is set out in its own right under Strategic Risk no.7. This includes the requirement for the Council to step up processes to support impacted communities in emergency situations.</p>	6.	<p>Establishment of a referral system to aid vulnerable residents.</p>	<p>Strategic Director Housing & Communities</p>	<p>PE1</p>
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2. Achieving future financial resilience

Inherent Risk Score	Current circumstance	Risk Control	Residual Risk Score	Further control to mitigate risk	Action Owner	CPTC
<p>Likelihood 3 x Impact 3 = High 9</p> 	<p>A. The Council's Medium Term Financial Plan is affected by numerous external economic factors, such as the high bank base rate and the current rate of inflation (cost of living). These factors place significant pressure on expenditure and impact the ability to generate income, noting the longer-term implications of recovering from economic challenges.</p> <p>Other factors, more specific to the Council include pay award, levelling up, the fair funding review, the impact of a business rate reset and increased salary costs resulting from a need to align pay with the wider market.</p> <p>The Council may also need to do more to support communities due to the potential for closure of local businesses and job losses as a result of the cost of living crisis.</p> <p>Given financial constrains affecting the Local Government sector as a whole, Local Authority Partners, may look to the District Council to support their own respective financial sustainability over the Medium term.</p>	<p>A1. Regular review of the Council's MTFP including reserve levels and future changes to funding.</p> <p>A2. Annual budget setting for revenue and capital including funding.</p> <p>A3. Utilisation of external financial support that provides support for funding modelling.</p> <p>A4. Regular budget monitoring reports and updates to senior officers and Members.</p> <p>A5. Treasury Management Strategy to ensure the Council is acting within the prudential indicators.</p> <p>A6. Maintain appropriate level of financial reserves as contingency arrangements to provide resilience over the medium term.</p> <p>A7. Working with County Council, Towns and Parishes to maximise opportunities for joint working.</p>	<p>Likelihood 2 x Impact 3 = Medium 6</p> 	<p>1. Continue to keep abreast of developments in:</p> <ul style="list-style-type: none"> • pay award • Fair Funding • National Business Rate Policy • Levelling Up • County Deals 	Strategic Director Corporate Resources S151 and Transformation	PR1
				<p>2. Maintain momentum and presence within the delivery of the Solent Freeport.</p>	Strategic Director Place Operations & Sustainability	PR2
				<p>3. Development of the Transformation Programme to deliver enhanced services and financial efficiencies to support the delivery of the Medium Term Financial Plan.</p>	Assistant Director Transformation	PR3
				<p>4. Keep up discussions with upper and lower tier authority partners to ensure effective and efficient service delivery to residents.</p>	Chief Executive	PE1

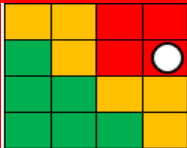
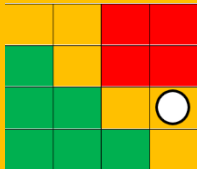
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			5. Implementing and embedding the Transformation Strategy that contains ample measures to support the successful implementation of the plan. This strategy encompasses numerous actions that will aid effective delivery of the transformation plan.	Strategic Director Corporate Resources S151 and Transformation	PR1
			6. Development of savings plans and invest to save initiatives.	Strategic Director Corporate Resources S151 and Transformation	PR1
			7. Development of capital plans in accordance with Capital Strategy with full financial appraisal and revenue implications	Strategic Director Corporate Resources S151 and Transformation	PR1

3. Ensuring efficient and effective internal control, governance and compliance

Inherent Risk Score	Current circumstance	Risk Control	Residual Risk Score	Further control to mitigate risk	Action Owner	CPTC
<p>Likelihood 3 x Impact 4 = High 12</p> 	<p>A. As a local authority we need to show appropriate compliance and controls:</p> <ul style="list-style-type: none"> - Financial Regulations - Financial Management Code - Payment Card Industry Data Security Standard Accreditation - Production and publication of various statutory documents - Effectiveness of the Capital Change and Delivery Board - Effectiveness of the new Project Management Framework - Timeliness of External Audit completion <p>We continue to follow best practise in terms of documenting our Annual Code of Corporate Governance review, and preparation of an Annual Governance Statement, both with actions plans.</p> <p>We must show suitable resilience in the face of ICT outage (such as the Worldwide issue witnessed in July 2024).</p>	<p>A1. Annual internal audit plan developed by senior officers and members is targeted at key risks areas and responsive to new areas of risk.</p> <p>A2. External/internal audit regime.</p> <p>A3. Annual Assurance Statements compiled testing compliance with key business activities, supporting Annual Governance Statement compilation.</p> <p>A4. Range of performance indicators that monitor internal controls.</p> <p>A5. Maintenance of a range of policies that underpin the control framework – Financial Regulations, Counter Fraud Strategy, Risk Management Framework, Contract Procedure Rules coupled with staff training.</p> <p>A6. Regular reporting at Audit Committee.</p>	<p>Likelihood 2 x Impact 4 = Medium 8</p> 	<ol style="list-style-type: none"> 1. Continue through information governance work programme, including updated document retention and destruction schedules for all services. 2. Management to undertake actions from the internal audit reports. 3. Ongoing engagement with external audit. 4. Continue to assess the effectiveness of the new Project Management framework for projects to ensure appropriate Governance arrangements are in place for all projects. 5. Financial Management Code –complete outstanding actions identified through the initial assessment. 6. Enhance member and officer development by offering continuous training, development and engagement opportunities. 	<p>Assistant Director Governance</p> <p>Strategic Director Corporate Resources S151 and Transformation</p> <p>Strategic Director Corporate Resources S151 and Transformation</p> <p>Assistant Director Transformation and Assistant Director – Governance</p> <p>Strategic Director Corporate Resources S151 and Transformation</p> <p>Assistant Director Governance</p>	<p>PL1</p> <p>PL1</p> <p>PL1</p> <p>PL1</p> <p>PL1</p> <p>PL1</p>

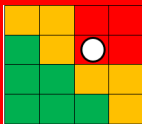
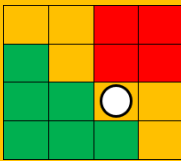
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	A7. Compliance with Transparency Code.		7. Continue to ensure high levels of statutory compliance standards across services.	Assistant Director Assistant Director Governance	PL1
	A8. Compliance with Local Code of Corporate Governance.		8. Review and update of Business Continuity Plans	Strategic Director Housing & Communities	PE1
	A9. Key compliance roles identified and assigned i.e., Section 151 Officer, Monitoring Officer, Data Protection Officer, H&S, Facilities Lead etc.		9. Annual review, testing and update of ICT Disaster Recovery Plan.	Assistant Director - Transformation	PL1
	A10. Compliance with information governance including the UK General Data Protection Regulation and Data Protection Act 2018.				
	A11. Housing and Facilities Compliance reported regularly through EMT.				
	A12. Information Governance Team in place with regular reporting through EMT.				
	A13. Financial Regulations and workflows built into core financial system.				
	A14: ICT Disaster Recovery Plan and service Business Continuity Plans are in place.				

4. Creating the right culture, capacity and capability

Inherent Risk Score	Current circumstance	Risk Control	Residual Risk Score	Further control to mitigate risk	Action Owner	CPTC
Likelihood 3 x Impact 3 = High 9 	A. The Council needs to attract, recruit and retain the high calibre of employee that it requires to fulfil its expectations in Service delivery.	A1. Employee Forum to encourage collaboration and engender a culture that enables change and innovation.	Likelihood 2 x Impact 3 = Medium 6 	1. Embedding of new Council Leadership structure (including necessary backfill).	Chief Executive	PL1
	B. The Leadership review has concluded and the Council now has a settled top tier leadership structure. There is however a risk around the time required to achieve organisational/cultural change.	A2. Learning and development programme to be developed and rolled out to provide training, tools and techniques to develop the necessary skills.		2. Progress learnings from employee survey.	Assistant Director Transformation	PL1
		A3. Regular 1-1's and annual PDI process.		3. HR developing plans to work with third parties to deliver a consistent and structured approach to training and development.	Assistant Director Transformation	PR3
		A4. Staff Suggestion scheme.		4. Keep abreast of developments in pay award negotiations and be ready to respond accordingly.	Assistant Director Transformation	PL1
		A6. Staff/union engagement. Project management/capability.		5. Transformation plan is live and includes design principles for a new operating model, approach, implementation, and necessary resources. A key aspect of the design principles will be our people strategy and organisational development opportunities.	Assistant Director Transformation	PL1
		A7. Staff/officer wellbeing and support.				
		A8. Corporate plan 2020-2024.				
		A9. Hybrid working increasing potential pool of staff.		6. Continue to identify opportunities that should be progressed in connection with improving service delivery.	Assistant Director Transformation	PL1

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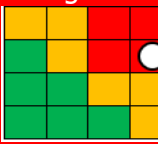
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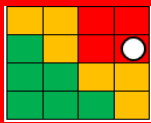

		<p>A10. More support and training on virtual working/managing staff.</p> <p>A11. Further ICT training to ensure maximum return on investment.</p> <p>B1. Communications plan (internal) allowing for regular staff engagement/progress updates.</p> <p>B2. Performance management and key performance indicators in place.</p>		<p>7. Allocate resource to support Corporate Plan ambitions.</p> <p>8. Investigation and identification of further collaborations that will support building capacity and capability (and resilience) including both public and corporate business.</p> <p>9. Transformation framework in progress</p> <p>10. Development of Workforce Strategy and enabling an agile workforce.</p>	<p>Strategic Director Corporate Resources S151 and Transformation</p> <p>Strategic Director Corporate Resources S151 and Transformation</p>	<p>PR1</p> <p>PR1</p> <p>PR1</p> <p>PL1</p>
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5. Ensuring robust security measures to protect the Council's digital data and ICT assets from external threats

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Inherent Risk Score	Current circumstance	Risk Control	Residual Risk Score	Further control to mitigate risk	Action Owner	CPTC
<p>Likelihood 4 x Impact 4 = High 16</p> 	<p>A. This risk relates to the Council's ability to defend itself against the constantly evolving threat from cyber based attack. The Council, in common with other public bodies, should be regarded as a high-profile target given the impact and publicity a successful attack can have.</p> <p>The current insurance market for public sector cyber risks is volatile.</p>	<p>A1. Up to date Disaster Recovery plan is in place.</p> <p>A2. Awareness training of officers and staff on the threats of cyber attacks.</p> <p>A3. Continued reviewing and tightening of existing IT Security Policy to ensure measures adapt to the changing threat, including awareness, familiarisation and training.</p> <p>A4. Acceptable use of IT policy to ensure staff are using equipment safely and appropriately.</p> <p>A5. Relationships with other agencies to ensure best practice is established.</p>	<p>Likelihood 3 x Impact 4 = High 12</p> 	<ol style="list-style-type: none"> Continued development of O365 services to improve email and anti-virus protections. Carry out annual penetration test. Ongoing refresher training on cyber risks for all staff. To look at service provisions externally that can assist with cyber risks. 	<p>Assistant Director Transformation</p> <p>Assistant Director Transformation</p> <p>Assistant Director Transformation</p> <p>Assistant Director Transformation</p>	<p>PL1</p> <p>PL1</p> <p>PL1</p> <p>PL1</p>

6. Ability to be agile and shift focus in response to policy and national political change

Inherent Risk Score	Current circumstance	Risk Control	Residual Risk Score	Further control to mitigate risk	Action Owner	CPTC
Likelihood 3 x Impact 4 = High 12 	<p>A. Changes in national politics and the general election (July 2024).</p> <p>Other legislation that will affect the council include:</p> <ul style="list-style-type: none"> The environment bill Future planning reform Changes the regulatory landscape to housing Housing delivery <p>There is a possibility of experiencing a shift in the political landscape post the general election.</p>	<p>A1. Continuous monitoring of political landscape to allow for early indicators of policy change.</p> <p>A2. Prudent financial and strategy assumptions to allow for agile responses.</p> <p>A3. Corporate Plan 2024-2028 adopted recently and work is proceeding accordingly.</p> <p>A4. Section 151 Officer role providing advice to the Council on current/ future financial challenges.</p> <p>A5. Reports to committee include explicit assessment of implications and therefore should identify/reflect current and future challenges.</p> <p>A6. The Executive should conduct horizon scanning to proactively anticipate and identify potential challenges and opportunities in order to influence outcomes through consultation.</p>	Likelihood 2 x Impact 4 = Medium 8 	1. Making sure the workforce is aware that training is available.	Assistant Director Transformation	PR3
				2. Ensuring professional training availability as this impacts departments e.g., Planning and Legal	Assistant Director Transformation	PR3
				3. Encouraging staff to undertake professional development and service-related training.	Assistant Director Transformation	PR3
				4. Prepare and implement the national changes arising out of the new Social Housing Charter, which represents the biggest change in social housing for 40 years. Work has been ongoing for the last 2 years to prepare and implement the necessary changes including reporting to EMT, Housing & Communities Overview & Scrutiny Panel and Cabinet.	Strategic Director Housing and Communities	PE3

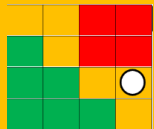
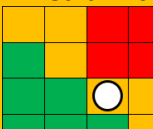
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		<p>A7. Membership of Local Government Association etc providing information/insights to the Council.</p> <p>A8. Members' roles and responsibilities including involvement in local networks, County Council, other agencies and national forums, enabling insight to be gained and shared with the Council.</p> <p>A9. Staff membership of professional bodies enabling own development and also providing for insights through membership of challenges that may present themselves to the Council.</p> <p>A10. Officer/member forums and networks.</p>				
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7. Delivering Council Services through adverse environmental conditions

Inherent Risk Score	Current circumstance	Risk Control	Residual Risk Score	Further control to mitigate risk	Action Owner	CPTC
<p>Likelihood 2 x Impact 4 = Medium 8</p> 	<p>A. The following may affect the delivery of Council Services from a national and local perspective:</p> <ul style="list-style-type: none"> - Natural disasters / local power outages - Workforce Strike Action - Global Pandemic - Terrorism - Riot/Rebellion - Flooding - Major pollutions of surface waters and groundwaters - Adverse Weather - Fire - Nuclear Powered Vessels related to pollution - Coastal Erosion - Industrial Strikes <p>The Council is supported by a dedicated resource focused on the leadership and management of Emergency Planning and Business Continuity initiatives, ensuring preparedness and resilience.</p> <p>The Council has established strategic partnerships with Town and Parish Councils, facilitating a coordinated response to assist communities affected by environmental events and enhance overall community resilience.</p>	<p>A1. Business Continuity framework and individual service continuity plans.</p> <p>A2. Threat response plans which will include ICT Infrastructure response, alternative accommodation provisions and reallocation of staff.</p> <p>A3. Emergency Planning Strategy and defined roles assigned.</p> <p>A4. We establish robust communication channels with NFDC residents across various platforms, including social media. Our strategic partnerships with local media outlets, both radio and print, facilitate effective messaging during incidents. We actively encourage vulnerable residents to enrol in the priority services register maintained by utility companies. Moreover, we leverage word-of-mouth communication, with community members engaging in door-to-door</p>	<p>Likelihood 2 x Impact 3 = Medium 6</p> 	<ol style="list-style-type: none"> 1. Annual programme of Emergency Planning training to be established. Robust training continues to be arranged and carried out for officers involved in emergency planning. Work continues in ensuring business continuity plans are in place, including for interruptions due to energy outages. 2. Review and challenge of functional Service Continuity Plan and conclude Business Continuity Planning. 3. Regular reporting to EMT on progress against Emergency Planning and Business Continuity action plan 4. Continuity to increase capacity for service to manage this risk. 5. Set up links to Town and Parish councils as they would be involved in implementing actions through adverse conditions. 	<p>Strategic Director Housing & Communities</p> <p>Strategic Director Housing & Communities</p> <p>Strategic Director Housing & Communities</p> <p>Strategic Director Housing & Communities</p> <p>Strategic Director Housing & Communities</p>	<p>PR1</p> <p>PL3</p> <p>PL3</p> <p>PL3</p> <p>PL3</p>

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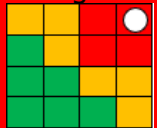

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		<p>outreach to disseminate crucial information. During incidents, utility companies provide stakeholder emails to local councillors, ensuring they are well-informed and able to relay timely updates to their communities.</p> <p>A5. The Emergency Planning response plans acts as a safeguard by centralising threat response plans and contact information for Town and Parish Councils, ensuring efficient coordination and rapid reaction to potential threats.</p>				
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8. Responding to the Climate and Nature Emergency

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Inherent Risk Score	Current circumstance	Risk Control	Residual Risk Score	Further control to mitigate risk	Action Owner	CPTC
<p>Likelihood 4 x Impact 4 = High 16</p> 	<p>A. NFDC declared a Climate Change and Nature Emergency in 2021 in response to global temperature rise and the associated impacts on natural and built environments. Declaring an emergency demonstrates NFDC's commitment to the legally binding target set by Central Government for the UK to reach net zero carbon by 2050, however progress in achieving the agreed targets is significantly off track at national and global levels.</p> <p>As a result of climate change, the New Forest area is expected to experience: Hot drier summers and warmer winters More frequent and extreme heatwaves, droughts flooding and coastal erosion.</p> <p>Failing to reduce emissions, improve environmental quality and adequately adapt to climate change will have impacts for NFDC residents, tenants, businesses, visitors, and the economy.</p> <p>Responding at a pace and scale comparable to the declared emergency will ensure that the environmental, social, financial and reputational risks to NFDC are minimised, and any opportunities arising from the changing climate are maximised.</p>	<p>A1 Deliver organisational and area-wide actions to reduce emissions, adapt to climate change and safeguard the natural environment, as outlined in the Climate Change and Nature Emergency Action Plan.</p> <p>A2. Deliver, monitor and report on four key programmes of work: carbon reduction, climate adaptation, nature recovery and programme management.</p> <p>A3. Governance and oversight from Climate and Nature Steering Group and Place and Sustainability Overview and Scrutiny Panel.</p> <p>A4. Climate Change and Nature Emergency Annual Report to inspire behaviour change, demonstrate corporate leadership and ensure transparency, accountability, and governance - detailing action to date, progress against targets and future actions.</p>	<p>Likelihood 3 x Impact 4 = High 12</p> 	<ol style="list-style-type: none"> Successful delivery of projects within the organisational and area-wide Climate Change and Nature Emergency Action Plan. Climate and Sustainability to be identified as key priorities in the new Corporate Plan, Local Plan and other key strategies e.g., Greener Housing Strategy Development of policy framework to ensure business as usual activities of NFDC services contribute positively to climate and sustainability objectives. Creation of a 5-year strategy and action plan with aligned resources and targets. Inclusion of climate change risks in service level risk assessments and business continuity plans. Training for officers and members, particularly O&S panel members, on climate change, nature and sustainability issues. 	<p>Strategic Director Place Operations & Sustainability</p> <p>Strategic Director Place Operations & Sustainability</p> <p>Strategic Director Place Operations & Sustainability</p> <p>Strategic Director Place Operations & Sustainability</p> <p>Strategic Director Place Operations & Sustainability</p> <p>Strategic Director Place Operations & Sustainability</p>	<p>PL2</p> <p>PL2</p> <p>PL2</p> <p>PL3</p> <p>PL2</p> <p>PL2</p>

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	<p>National and local actions are key to achieving environmental goals, which include grid decarbonisation, policy planning, and enabling a green economy. However, funding these initiatives is challenging and could affect residents' costs of living.</p>	<p>A5. Consideration of climate change and sustainability issues in the early stages of all activities, including projects, plans, strategies, and procurements.</p>		<p>7. Aligning level of resourcing to meet emerging corporate priorities.</p>	<p>Strategic Director Corporate Resources S151 and Transformation</p>	<p>PL2</p>
		<p>A6. Prioritisation of climate change and sustainability in the Corporate Plan, Local Plan and other key strategies.</p>		<p>8. Review of Coastal Strategy and Actions. Climate Change Action Plan with Ongoing partnership working.</p>	<p>Strategic Director Place Operations & Sustainability</p>	<p>PL2</p>
		<p>A7. Ensuring adequate resources for climate and sustainability efforts including third party financial support.</p>		<p>9. Service risk assessments and business continuity plans to be developed.</p>	<p>Strategic Director Corporate Resources S151 and Transformation and Strategic Director Housing</p>	<p>PR1</p>

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