

# Project Appraisal Report

Authority Scheme Reference	SBC39
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LDW/CPW Number	YOS351C/001A/045A
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Promoting Authority	Scarborough Borough Council
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Scheme Name	Staithes Urgent Harbour Wall Improvements
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Staithes Harbour Wall (January, 2012)

Date	24 <sup>th</sup> May 2012
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Version	1
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PAR for *(Project Name)*

Version	Status	Signed off by:	Date signed	Date issued
1				

PAR Template – August 2010



For Official Use Only	
Grant allocation No.	

Land Drainage Act 1991 - Section 59

Internal Drainage Board / Local Authority

## Flood Defence Schemes: application for grant

### NOTES

- Once completed, two copies of this form should be sent to:  
The office of the Area Flood and Coastal Risk Manager for your river catchment
- The general conditions governing grants from the Agency are set out in the Memorandum relating to Flood Risk Management grants. That document does not, either by itself or in conjunction with any other document, constitute or form part of a contract between the Drainage Board / Local Authority and the Agency, acting on behalf of the Defra Secretary of State.
- The Agency may refuse to pay grant on work started without prior approval.**  
**No grant is payable on the cost of maintenance of drainage work.**
- Please complete form in BLOCK LETTERS.

### Part A: Scheme details

- Name of Drainage Board / Local Authority (LA)   
  
Address   
  
  

Postcode
- The Board's / LA's Scheme reference no.
- Name of Scheme including location (maximum of 60 characters)
- Is this a private scheme to be carried out on an arterial watercourse not maintained by the Board / LA? (Tick appropriate box) YES ☐ NO ☒

If **YES**, please give details

If **NO**, is it proposed to finance the Board's share of the cost by:

loan?..... ☐ or revenue?..... ☐

If by loan:

- what is the loan period required?

years

- is a formal application for loan consent by Defra enclosed?

YES ☐ NO ☐

- Estimated Grant Eligible costs (excluding statutory charges and administrative expenses charged to capital):

	£ Grant Eligible
(a) Preliminary investigations	15k
(b) Instrumentation and machinery	
(c) Construction works	85k
(d) Land purchase	
(e) Compensation	
(f) Staff salaries/costs	14.5k
(g) Professional / consultants' fees	2.5k
(h) Other costs (please specify)	
(i) Contingencies	23k
<b>Total estimated costs</b>	<b>140k</b>

## Part A: Scheme details (continued)

6. Please give details and amounts of contributions (if any)

	£
<b>Total contributions</b>	

7. Is work to be carried out by:

direct labour?

☐

contract?

☐

both?

☒

**Tick appropriate box**

Please give details. In the case of contract work, attention is drawn to paragraphs 83 to 87 of the Memorandum relating to FRM grants made under the Land Drainage Act 1991.

CONSTRUCTION – BY SBC FRAMEWORK MAINTENANCE CONTRACTOR  
DESIGN & SITE SUPERVISION – SBC STAFF

**Now please read and sign the declarations below**

## Part B: Declarations

8. (a) I confirm that the obligation/s specified in the following Statutory Instruments has/have been met:

- \* SI 1999 No. 1783 Land Drainage Environmental Impact Assessment (Land Drainage Improvement Works) Regulations 1999, as amended to date.
- \* SI 1999 No 293 Town and Country Planning (Environmental Impact Assessment) Regulations 1999.

**\* Delete as appropriate**

- (b) **Declaration**

- I confirm that this application in respect of the Scheme described in the Engineer's report dated **24<sup>th</sup> May 2012** is submitted to the Environment Agency, for grant aid under the Land Drainage Act 1991;
- I accept the conditions set out in the Memorandum Relating to Flood Defence Grants under the Land Drainage Act 1991, in particular paragraph 26, that the Agency acting on behalf of the Defra Secretary of State does not accept legal liability nor relieve the Board / LA of any obligation it has, statutory or otherwise;
- I confirm that all necessary supporting documents are attached to this form and are in accordance with the requirements set out in the above mentioned Memorandum;
- I have given details that are true and complete to the best of my knowledge and belief.

## WARNING

**A false or inaccurate statement can lead to loss of entitlement and recovery of any payments made.**

By the Order of the

Signature

Date

*Authorising Officer*

Name in  
BLOCK LETTERS

Telephone  
Number

## For Official Use Only

This scheme, estimated to cost **£**  is approved on behalf of the Secretary of State for grant of  % on estimated eligible expenditure of **£**  or the approved actual eligible expenditure, whichever is the less.

Signature

Date

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## Approval History Sheet

APPROVAL HISTORY SHEET (AHS)			
1. Review (to be completed by promoting Authority)			
Project Title: Staithes Urgent Harbour Wall Improvement Scheme			
Authority Project Code: SBC39		Date of PAR: 24/5/2012	
Lead Authority: Scarborough Borough Council			
Consultant: Royal Haskoning		Version No: 1	
Position	Name	Signature	Date
"I have reviewed this document and confirm that this project meets our quality assurance requirements, satisfies all the required environmental obligations and meets Defra investment appraisal criteria. I confirm that all internal approvals including member approval have been completed for this project and recommend submission to the Environment Agency for eligible capital grant approval in the sum of £140k"			
Authority Project Executive	Stewart Rowe		
"I have reviewed this document and confirm that it complies with the current PAR guidelines for Local Authority and IDB submissions"			
PAR Reviewer			
"I confirm that I have consulted with the Head of FCRM & Business Finance and that the project is ready for submission to PAB/NRG"			
Area Flood Risk Manager			
PAB – Project Assessment Board <input checked="" type="checkbox"/> (Projects less than £2 million) (Check box to indicate which is appropriate)		NRG – National Review Group <input type="checkbox"/> (Projects greater than £2 million)	
Date of Meeting(s):		Chairman:	
Recommended for approval: In the capital grant eligible sum of £:		Date:	Version No:
<b>3. Project approval</b> Officers in accordance with the FSoD: Specified Officer; Regional Director; Director of Operations; Chief Executive or Director of Finance: Agency Board			
Version No:		Date:	
Capital Grant sum Approval	By: In the sum of: £ <i>(if different from above)</i>	Date:	
Breakdown of approved costs			
<b>4. Defra approval</b>			
Submitted to Defra or Not Applicable (as appropriate)		Date:	
Version No. (if different):			
Defra Approval: or Not applicable (as appropriate)		Date:	
Comments:			





# 1 Executive Summary

## 1.1 Introduction and Background

### Location and Background

1.1.1 The purpose of this report is to seek approval to undertake works on the Staithes Urgent Harbour Wall Improvements to extend the residual lives of the existing coast defence assets, and thereby delaying the requirement for a capital scheme.

1.1.2 Staithes is located on the North Yorkshire coast, in the Scarborough Borough Council (SBC) local authority area. Staithes Beck runs around the edge of the village in a steep ravine, separating Staithes on the east bank from Cowbar on the west. The old historic village runs down the side of the ravine of Staithes Beck and around the base of the cliffs surrounding the harbour.

1.1.3 Staithes is covered by the River Tyne to Flamborough Head Shoreline Management Plan 2 produced in 2007. The adopted policy is to hold the line in the short, medium and long term. Although there is not a Strategy for the Staithes frontage, the works proposed by this PAR will not compromise any future strategic decisions as they comply with the SMP2 policy of hold the line and do not change the current standard of service.

1.1.4 The aim of the works is to sustain the current standard of service provided by the existing coast defence assets in Staithes, whilst maximising the longevity of the previous investments. This is in line with the expected future works from the Staithes Phase 3 Harbour Improvement Scheme completed in 2002.

### History of Flooding and Coastal Erosion

1.1.5 Staithes has benefitted from a phased programme of coast protection works over the previous decades. The harbour is sheltered by two extensive concrete breakwaters with rock armour on the outer face. Three phases of construction works since 1989 have upgraded the breakwaters to ensure their long term structural stability and to reduce the wave climate in the harbour to reduce flooding of the village from wave overtopping and decrease the destructive wave forces which damage the harbour walls that support properties.

1.1.6 Following completion of Phase 3 the properties of Staithes had an improved standard of protection of flooding, reducing the probability from the 1 year return period storm to approximately the 50 year return period storm. In addition the structural condition of the breakwaters was improved, with a design life of 50 years. Phase 3 of the works recognised that ongoing maintenance of the seawalls within the harbour would be required to ensure ongoing protection to the properties.

## 1.2 Problem

1.2.1 The harbour wall is made up of a variety of different sections of walls, built at different times using different materials and methods. The resulting harbour wall is very 'piecemeal'. Behind the wall is a combination of privately owned

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properties and access roads. The harbour walls directly support some of the properties in some locations, and in other locations the properties are set back slightly.

1.2.2 The harbour walls are in a poor state of repair. Further deterioration of the condition of the walls could result in the failure of the structures within 10 years, which would place properties at immediate risk of collapse and risk of further coastal erosion. 28 residential properties would be at immediate risk following collapse of the harbour walls, with an additional 33 properties (30 residential and 3 commercial) at risk by the end of the appraisal period. Photographs of the study area and defects identified during asset inspections are included in Appendix C.

## 1.3 Options Considered

1.3.1 The baseline option for the option appraisal is the Do Nothing. The full list of options considered is:

- **Option 1: Do Nothing** – this is the ‘walk away’ option, no further maintenance or repair works would be carried out.
- **Option 2: Do Minimum** – routine maintenance would continue, this would include inspections, remedial actions to maintain existing levels of health and safety, however no large scale repairs would be carried out.
- **Option 3: Wall Improvements Works** – the existing harbour walls would be repaired. This is the Sustain Standard of Service (SoS) option.
- **Option 4: Replace Wall** – the existing harbour walls would be replaced with a new structure along the existing alignment.

## 1.4 Preferred Option

### Description

1.4.1 Option 3: Wall Improvement Works is the preferred option on economic, technical and environmental criteria. It is the only Do Something option with a positive benefit-cost ratio (BCR) and has a significantly lower cost than the other Do Something option. Technically, Option 3 is the least complex and has fewer risks associated with it. Option 3 also fits in better with the anticipated future works of the Phase 3 Harbour Improvement Scheme and the timescales for its design life. Option 3 will ensure that the benefits of the previous investment in the Phase 3 Harbour Improvements Scheme are realised with minimal further investment.

1.4.2 It is proposed that improvement works will be carried out to approximately 65% of the harbour walls. The improvement works will be targeted at the priority sections where defects have been identified that threaten the structural stability of the harbour walls. The types of improvement works that will be undertaken include toe protection works, repointing, re-facing of concrete walls and apron, and removal of high-level vegetation. Details of the works proposed are included in Appendix D.

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## Environmental Considerations

- 1.4.3 Potential environmental impacts have been identified to the breeding seabird colonies at Cowbar, specifically resulting from the proposed works to the stone leaf and bridge abutment. In order to avoid any adverse effects, these works are proposed to be undertaken outside of the breeding seabird season (February to mid-August).
- 1.4.4 Potential effects from noise and vibration, and to water quality, tourism and recreation and landscape / seascape character and visual amenity value have been avoided and / or minimised through managing the works programme and by adhering to best practice and pollution prevention guidance.
- 1.4.5 Potential spills of debris and material from the works entering the marine environment will be prevented by ensuring that, where possible, the timing of concreting works will allow sufficient time to elapse for the concrete to have set sufficiently to prevent wash out. Where tides or river levels prevent this, precautions will be taken to prevent wet concrete or mortar products from coming into contact with the marine environment through the use of temporary shuttering to exposed concrete faces. Any equipment, temporary works and debris associated with the works will be removed upon completion, to avoid impact on Sea Trout.

## Benefits

- 1.4.6 The details of the benefits assessment can be found in Appendix F. Damages have been calculated for a 40 year appraisal period in order to tie into the appraisal period for the existing Phase 3 Harbour Improvement Scheme, which forms the main coast protection works for Staithes and is integral to any works undertaken to the harbour walls.
- 1.4.7 The damages that have been quantified are for loss of property due to coastal erosion. In order to ensure that double counting of benefits do not occur the properties included within the benefit area for the Phase 3 Harbour Improvement Scheme have been excluded from the damage assessment in this PAR. The total Do Nothing present value damages (PVd) for this PAR are £3,208k.
- 1.4.8 As Option 3 will prolong the residual life of the harbour walls until the end of the appraisal period it will have no residual damages within the appraisal period. Therefore the present value benefits are £3,208k.

## Costs

- 1.4.9 The construction costs for the Option 3 improvement works have been developed by Scarborough Borough Council's framework maintenance contractor (Transcore Ltd), to a March 2012 price date, these are based on framework rates and as such there is a high level of certainty. A breakdown of the construction costs can be found in Appendix G. The design of the works and the site supervision will be undertaken by SBC's in-house technical team.
- 1.4.10 Due to the type of works involved in the improvement works, primarily re-pointing, re-surfacing and toe works it is not anticipated that significant site investigation will be required; however party wall surveys will be needed.

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Similarly there is little opportunity for any environmental enhancements and the mitigation proposed can be accomplished by following construction related best practices. Compensation will not be required; the asset owners will be foregoing compensation as payment in kind for the works, which SBC will be carrying out on the owners' behalf using their permissive powers.

**Table 1.1 Project Costs (£k)**

	Economic appraisal	Whole Life Cash Cost	Approval
<b>Costs to PAR</b>	N/A – sunk costs	20	20
<b>PAR to Construction</b>			
Local Authority staff	9.5	9.5	9.5
Consultant fees	2.5	2.5	2.5
Early Contractor Involvement (ECI)	0	0	0
Cost consultant fees	0	0	0
Site investigation & survey	15	15	15
Construction costs	85	85	85
Environmental enhancements	0	0	0
Environmental mitigation	0	0	0
Site supervision	5	5	5
Compensation	0	0	0
<b>Risk contingency</b>			
20% Optimism Bias			23
Optimism Bias	23	23	
<b>Inflation</b>	N/A	N/A	0
<b>Future Costs:</b>	41	75	N/A
<b>Other</b>	0	0	0
<b>Contributions</b>			0
<b>TOTAL</b>	181	235	140

## Economic Summary, Outcome Measures and Priority

1.4.11 The Partnership Funding calculator (Appendix F) shows that the raw outcome measure score is 462%; this clearly demonstrates the project is excellent value for money. However as an approved business case was not in place at time of funding allocation process for 2012-13 the scheme was pushed back.

1.4.12 Due to the urgent nature of the works the Yorkshire Regional Flood and Coastal Committee considered that alternative funding in the form of the Local Levy should be used to ensure that the project could be carried out this year to reduce costs should further erosion occur.

**Table 1.2 Benefit-Cost Ratios and Outcome Measures**

Outcome Measures		Number	Qualifying Benefits	FDGiA Contribution
OM1 (Economic Benefit)			£518k	£29k
OM2 (Households better protected against flooding)	20% most deprived areas	0	£0	£0
	21-40% most deprived areas	0	£0	£0
	60% least deprived areas	0	£0	£0

OM3 (Households better protected against coastal erosion)	20% most deprived areas	0	£0	£0
	21-40% most deprived areas	58	£2,690k	£807k
	60% least deprived areas	0	£0	£0
OM4 (Statutory Environmental Obligations Met)			£0	£0
TOTAL FDGiA Contribution				<b>£836k</b>
Raw OM Score				461.80%
Cost saving and/or external contribution required				£0k
Scheme Contributions Secured				£41k
Adjusted OM Score				484.46%

## Funding and Contributions

- 1.4.13 As the Staithes Urgent Harbour Wall repairs are a very cost efficient way of providing some protection for the properties and there are no majority beneficiaries, a contribution is not required. It is recommended that for any future longer term work the risk management authorities involved work with the communities to establish a sustainable way of funding and maintaining any future works.

- (a) PAR preparation.....£20k.....
- (b) Construction works **(complete as appropriate)**.....£85k
- Authority's own/hired manual labour engaged on works
  - Authority's own/hired plant used on works
  - Materials
  - Work carried out by contract **(list contractors)**...
    - 1.
    - 2.
    - 3.
- (c) Land purchase payments **(including fees)**.....(please specify in Part D).....£0k.
- (d) Compensation payments **(including fees)**..... (please specify in Part D) .....£0k
- (e) Existing Staff costs wholly associated with project
- Design £2k
  - Authority's project management staff salaries £12.5k
- (e) Additional Staff costs wholly associated with project
- Design
  - Authority's project management staff salaries
- (f) Professional/consultant's fees.....£17.5k
- (g) Contingencies.....£23k
- (h) Other costs **(please specify)**.....
- - 
  -
- (i) **Total £140k**  
**Less Existing Staff Costs**
- (j) Less deductible contributions received or receivable  
**(please specify)**.....
- -
- (k) Less non-approved cost increases and approved project items not eligible for grant  
**(please specify)**.....
- - 
  -
- (l) **Net expenditure (eligible for grant) £140k**  
**[line (i) less line (j) and line (k)]**

## Key Delivery Risks

- 1.4.14 The key delivery risks are outlined in Table 1.3, the risk register (Appendix I) has been developed by the project team. The risk allowance of £23k is based on an optimism bias of 20%.

**Table 1.3 Risks and Mitigation**

Key project risk	Adopted mitigation measure
Extent of repairs required is greater than anticipated	<ul style="list-style-type: none"> <li>Improvements required are based on visual inspections carried out in 2010 when beach levels were very low.</li> <li>A 20% contingency for the repair works has been identified within the funding application to allow for unforeseen scope changes.</li> </ul>
Weather and Tidal conditions result in delays to programme	<ul style="list-style-type: none"> <li>Contract used with framework contractor does not allow for claims for weather or tidal delays. Works are carried out on a re-measure basis, therefore there is a risk of additional costs for scope changes from unforeseen ground conditions or extent of repairs, but not from weather or tidal delays to programme.</li> </ul>
Access to site for equipment or deliveries is unexpectedly obstructed resulting in delays to the programme	<ul style="list-style-type: none"> <li>Access routes to be agreed prior to start of construction.</li> <li>Deliveries to be carefully programmed.</li> </ul>

## 1.5 Recommendation

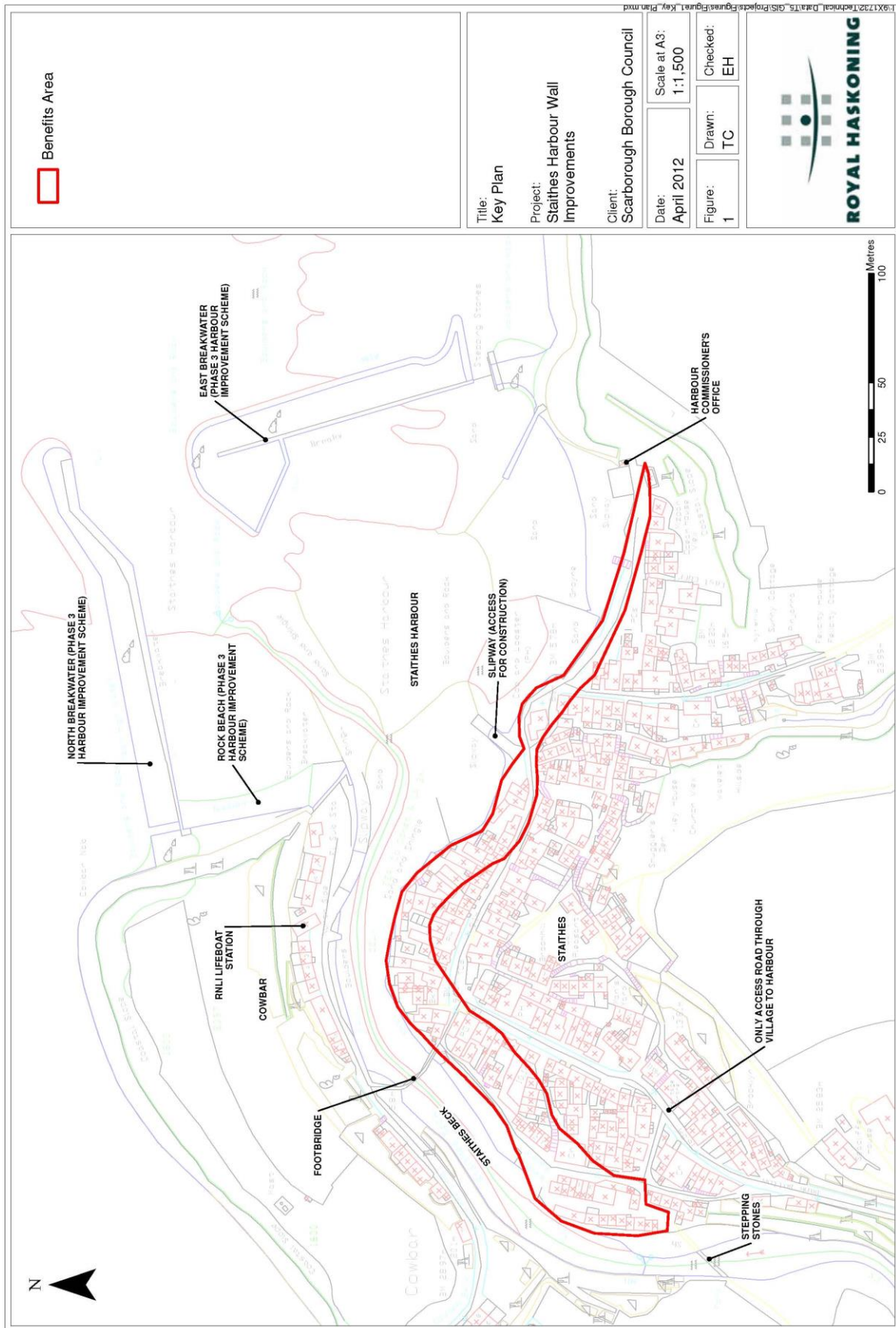
- 1.5.1 We recommend that the Environment Agency gives technical and financial approval to the Staithes Urgent Harbour Wall Improvement Scheme in the sum of £140k which includes a contingency of £23k, for the design and construction of the preferred option which is Option 3: Wall Improvement Works.
- 1.5.2 The sum of £140k will be funded by the Local Levy, unless Flood Defence Grant in Aid funding becomes available this financial year (2012-13). If an opportunity comes forward within 2012-13 to transfer the spend to a FDGiA source of funding then the funding will be changed and the Local Levy funding returned as balances can be carried over.

## 1.6 Briefing Paper

<b>Authority:</b>	Scarborough Borough Council	<b>Project Executive:</b>	Stewart Rowe		
<b>Project Title:</b>	Staithes Urgent Harbour Wall Improvement Scheme		<b>Code:</b>	YOS351C/001A/045A	
<b>Consultant:</b>	Royal Haskoning	<b>Contractor:</b>		<b>Cost Consultant:</b>	
<b>The Problem:</b>	The harbour wall is made up of a variety of different sections of walls, built at different times using different materials and methods. The harbour walls in some locations are in a poor state of repair. Further deterioration of the condition of the walls could result in the failure of the structures, which would place properties at immediate risk of collapse and risk of further coastal erosion.				
<b>Assets at risk from flooding:</b>	44 residential properties and 2 commercial properties at risk of coastal erosion				
<b>Existing standard of flood protection:</b>	1 in 50 year	<b>Proposed standard of flood protection:</b>	Sustain SoS		
<b>Description of proposed scheme:</b>	The improvement works will be targeted at the priority sections where defects have been identified that threaten the structural stability of the harbour walls. The types of improvement works that will be undertaken include toe protection works, repointing, re-facing of concrete walls and apron, and removal of high-level vegetation.				
<b>Costs (PVC): (100 year life inc. maintenance)</b>	£181k	<b>Benefits: (PVb)</b>	£ 3,208k	<b>Ave. B: C ratio: (PVb/PVc)</b>	17.72
<b>NPV:</b>	£ 3,027k	<b>Incremental B: C ratio:</b>	n/a	<b>Whole life cost (cash value):</b>	£235k
<b>Choice of Preferred Option:</b>	Option 3: Wall Improvement Scheme				
<b>Total eligible cost for which capital grant approval is sought:</b>	£ <b>140k</b> (incl. £0 inflation & £23k contingency)				
<b>Delivery programme:</b>	Planning Approval: n/a Award Construction Contract: 21/9/2012 Construction Start: 24/9/2012 Construction end: 1/3/2013 End of Project: 1/3/2013				
<b>Are funds available for the delivery of this project?</b>	Yes				
<b>External approvals:</b>	n/a				
<b>Outcome measures</b>	44 residential properties (20-40% most deprived) Overall OM score: 484%				



## 1.7 Key Plan(s)



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## 2 Introduction and Background

### 2.1 Purpose of this Report

2.1.1 The purpose of this report is to seek approval to undertake works on the Staithes Urgent Harbour Wall Improvement Scheme in Staithes harbour, North Yorkshire, to extend the residual lives of the existing coast defence assets, and thereby delaying the requirement for a capital scheme.

2.1.2 The appraisal has been carried out in accordance with the Defra Flood and Coastal Erosion Risk Management Appraisal Guidance and associated Environment Agency procedures and policies.

2.1.3 This project will be carried out under the powers of the Coast Protection Act 1949.

### 2.2 Background

#### Strategic and Legislative Framework

2.2.1 Staithes is covered by the River Tyne to Flamborough Head Shoreline Management Plan 2 produced in 2007. The adopted policy for Staithes is to hold the line in the short, medium and long term. The SMP2 recommended that a detailed strategy study should be developed for the local management of defences, taking into account the works at Cowbar to the north.

2.2.2 A comprehensive Strategy for the Staithes frontage has not yet been completed. However the works proposed by this PAR will not compromise any future strategic decisions as they comply with the SMP2 policy of hold the line and do not change the current standard of service. The aim of this project is to prolong the residual life of the existing assets. This is also in line with the expected future works from the Staithes Phase 3 Harbour Improvement Scheme completed in 2002.

#### Previous Studies

2.2.3 A number of studies have been carried out over the last thirty years for Staithes, resulting in a phased programme of coast protection works. For details of the existing coastal defences see Section 2.3.

#### Location and Designations

2.2.4 Staithes is located in North Yorkshire, in the Scarborough Borough Council (SBC) local authority area, close to the boundary with Redcar & Cleveland. It is located on a north-facing stretch of coastline, 15km north-west of Whitby. Staithes Beck which marks the boundary between local authorities runs around the edge of the village in a steep ravine, separating Staithes on the east bank from Cowbar on the west.

2.2.5 The village is in two parts, with the more recent properties located slightly inland at the top of the cliffs. The old historic village runs down the side of the ravine of

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Staithes Beck and around the base of the cliffs. The properties surround the harbour at the foot of the cliffs.

2.2.6 Sandsend is a historic village, formerly one of the largest and most productive fishing centres in England, tourism is now the predominant industry in the village. The village has a large proportion of holiday and second homes.

2.2.7 The village is within the boundary of the North York Moors National Park (NYMNP) the North Yorkshire and Cleveland Heritage Coast and Runswick Bay recommended Marine Conservation Zone (rMCZ). Staithes-Port Mulgrave Site of Special Scientific Interest (SSSI) is located to the immediate east of the eastern breakwater. The proposed works are also located within Staithes Conservation Area.

2.2.8 The harbour is surrounded by a series of walls of varying ages and heights, with a mixture of concrete and masonry. On the SBC side of Staithes Beck the harbour walls extend from the Harbour Commissioner's Office at the east end of the beach within the harbour, around the harbour and up Staithes Beck to the stepping stones which mark the tidal limit of the watercourse.

2.2.9 Properties surround the harbour and are built right up to the top of the harbour walls with some properties directly supported by the walls.

2.2.10 Photographs of the harbour, existing Phase 3 Harbour Improvements Scheme, and the walls can be found in Appendix C.

## **2.3 Current Approach to Flood Risk Management**

### **Measures to Manage the Probability of Flood Risk and Coastal Erosion Risk**

2.3.1 The harbour is sheltered by two extensive concrete breakwaters with rock armour on the outer face; the concrete structures date back to the 1920s and were originally island breakwaters unconnected to the mainland. The properties around the edge of the harbour are supported by a series of vertical concrete and masonry walls of different ages and in varying condition. The majority of the seawalls predate the breakwaters. There are also two concrete groynes and the old south breakwater structure (acts as a groyne as it is now within the enclosed harbour).

2.3.2 Staithes has benefitted from a phased programme of coast protection works over the previous decades:

- Phase 1: placement of 3-6 tonne rock armour at a 1:3 slope along seaward face of the north breakwater with crest elevation of +3.4m. The gap between the north breakwater and the cliff was closed by a rubble mound structure. This phase was constructed in 1989-90.
- Phase 2: placement of 3-6 tonne rock armour at a 1:3 slope along seaward face of the east breakwater with crest elevation of +3.4m. The gap between the east breakwater and the cliff was closed by a rubble mound structure. This phase was constructed in 1991-92.

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- Phase 3: Originally proposed as a large rock groyne and rock revetment within the harbour, this phase was changed due to environmental and public considerations. Scheme constructed consisted of raising the crest level of both the north and east breakwaters to +5.4m with 10 tonne rock, construction of a mass concrete spur from the east breakwater into the harbour with 10 tonne rock on outer face. In addition a rock beach along the northern edge of the harbour at Cowbar Nab was constructed with 1 tonne rock at a 1:4 slope above the MHWS tidal level. The scheme was substantially completed in 2002, with some outstanding works carried out in 2005.

### 2.3.3 The objectives for these works were to:

- Reduce flooding of the village due to wave overtopping of the seawalls within the harbour, which occurred on a regular basis (estimated to be 1 in 1 year return period storm);
- Improve the structural condition of the breakwaters and ensure their long term stability; and
- Reduce the wave climate within the harbour to decrease the rate of deterioration of the seawalls due to wave forces, in order to continue to protect the properties from erosion.

2.3.4 Following completion of Phase 3 the properties of Staithes had an improved standard of protection of flooding, reducing the probability from the 1 year return period storm to approximately the 50 year return period storm. In addition the structural condition of the breakwaters was improved, with a design life of 50 years. Phase 3 of the works recognised that ongoing maintenance of the seawalls within the harbour would be required to ensure ongoing protection to the properties.

## Measures to Manage the Consequences of Flood Risk and Coastal Erosion Risk

2.3.5 There is currently no specific emergency response plan for Staithes. However there is a general emergency response template for the North Yorkshire Coast which is used by the Emergency Services, this has been successfully implemented recently at Knipe Point in Cayton, near Scarborough.

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## 3 Problem Definition and Objectives

### 3.1 Outline of the Problem

- 3.1.1 The harbour wall is made up of a variety of different sections of walls, built at different times using different materials and methods. The resulting harbour wall is very 'piecemeal'. Behind the wall is a combination of privately owned properties and their grounds, and access roads. The harbour walls directly support some of the properties in some locations, but in other locations the properties are set back slightly.
- 3.1.2 Prior to the construction of the works to the breakwaters the harbour walls were subject to regular attack by waves resulting in damage and degradation. Various repairs to remedy the damage to the harbour walls are evident and many were carried out prior to the construction of the breakwater works. The various phases of the Staithes Harbour Improvement Scheme have resulted in a reduced wave climate in the harbour. This has consequently resulted in the deterioration of the condition of the walls slowing down.
- 3.1.3 The harbour walls in some locations are however in a poor state of repair. Further deterioration of the condition of the walls could result in the failure of the structures, which would place properties at immediate risk of collapse and risk of further coastal erosion.
- 3.1.4 Asset inspections in 2010 identified 'older sections of harbour wall in need of regular maintenance' along the asset. Undercutting at the toe was also identified and it was suggested this was due to dynamic movement of sand. The report described evidence of repair work and suggested as the wall was in need of regular repair work perhaps replacement of structure should be considered. Photographs of the defects identified are included in Appendix C.
- 3.1.5 There has historically been insufficient knowledge of who the legal owners of the different sections of the harbour walls are and what the different responsibilities for maintaining the structures are. In the locations where the property owners are also the asset owner of the seawall it is likely that the property owners are not aware of their responsibilities with regards to maintaining the seawall. In 1968 the local authority at the time, Whitby Rural District Council, decided to take over the responsibility for repairs to the harbour walls up to ground level. As the current local authority SBC retain the responsibility for ensuring that maintenance is carried out using their permissive powers under the Coast Protection Act.

### 3.2 Consequences of Doing Nothing

- 3.2.1 If no further actions are taken to remedy the condition of the existing harbour walls then their condition will continue to deteriorate and failure of the structures will occur. The asset inspection in 2010 gave the harbour walls a residual life of 6 to 10 years.
- 3.2.2 As some of the properties are supported by the harbour walls and others are located directly behind the walls, these properties will be at significant risk of

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collapse as the harbour walls fail. There are 28 properties, all residential, either on or directly behind the harbour walls which would be at risk in this way.

3.2.3 Once the harbour walls had collapsed the ground behind the walls would become at risk of coastal erosion and additional properties set further back from the harbour walls would become at risk. 33 additional properties would be at risk (30 residential and 3 commercial). The property lost would be a large proportion of the old town surrounding the harbour; this would have a significant impact on the community of Staithes.

3.2.4 In addition to loss of property there would a loss of access to the beach and harbour, loss of the footbridge which connects the communities of Staithes and Cowbar, and an impact on the economy of the local area with the loss of tourism.

3.2.5 The failure and collapse of the harbour walls and the loss of property would prevent the anticipated benefits from the previous investments in coastal defences at Staithes from being realised.

### 3.3 Strategic Issues

3.3.1 The River Tyne to Flamborough Head Shoreline Management Plan 2 (2007) covers this area and the adopted policy for Staithes is to hold the line in the short, medium and long term. The SMP2 recommended that a detailed strategy study should be developed for the local management of defences, taking into account the works at Cowbar to the north. There is currently no strategy for Staithes; however a strategy may be developed in the future.

3.3.2 The proposed works comply with the SMP2 policy of Hold the Line and do not compromise any future development of a Strategy or change in risk management.

3.3.3 There is an existing coastal defence scheme in place at Staithes, which has the effect of reducing the wave climate within the harbour and therefore decreasing the damaging forces the walls are subject too. Any works to the harbour walls will have to work in combination with the existing scheme in order to ensure that the potential benefits of the previous investment are realised. The presence of the existing scheme will impact on the economic assessment for this PAR, as there is potential for double counting of benefits due to overlapping benefit areas.

3.3.4 The Phase 3 Harbour Improvement Scheme recognised that additional works to the harbour walls would be required in the future; therefore the improvement works proposed by this PAR are in line with the anticipated future works of the previous scheme. Without any works now to remedy the condition of the harbour walls the benefits for the previous schemes will not be realised.

### 3.4 Key Constraints

3.4.1 Start writing here The key constraints include:

- Staithes is a working harbour and has a RNLI lifeboat station on the Cowbar side of the harbour, there is potential for there to be conflicts with users of the harbour during the construction of the works;

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- Access is restricted due to the close proximity of properties and limited access points onto the foreshore. There are also access constraints on the roads down to the harbour due to the steepness and narrowness of the roads.
- There are a series of properties that back onto the harbour walls, and therefore there are potentially a large number of asset owners who would need to be consulted on the project.
- The proposed works have the potential to affect nesting seabird colonies, including nesting kittiwakes, herring gulls and common gulls.
- The proposed works are within Staithes Conservation Area and North Yorkshire and Cleveland Heritage Coast. Any works will need to consider the character and appearance of these designations.
- Staithes-Port Mulgrave SSSI is located to the east of Staithes, adjacent to the eastern breakwater. Works should ensure that they do not affect this site.

## 3.5 Objectives

3.5.1 The aim of the works is to sustain the current standard of service provided by the existing coast defence assets in Staithes, whilst maximising the longevity of the previous investments.

3.5.2 The objectives of this project are to:

- Sustain the current standard of service (SoS);
- Ensure the benefits of the previous capital schemes (breakwaters) are realised;
- Provide ongoing protection to the properties of the old part of Staithes, and maintain the character of the community;
- Maintain Conservation Area's character and appearance; and,
- Carry out the works without adversely impacting on the seabird breeding colonies on the Cowbar cliffs.

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## 4 Options for Managing Flood Risk

### 4.1 Potential FCRM Measures

- 4.1.1 The range of risk management measures that can be considered for the Staithes harbour walls is limited due to the presence of the existing Phase 3 Harbour Improvement Scheme (breakwaters) which is still well within its design life, and the setting of the harbour walls with the close proximity of properties and environmentally sensitive areas. The options being considered are therefore restricted to options which deal with the problem of the condition of the harbour walls directly at source.
- 4.1.2 The existing Phase 3 Harbour Improvement Scheme which was constructed in 2002 has a minimum design life of 50 years and the economic case was assessed over a 50 year appraisal period. Therefore the options for addressing the issues at the harbour walls will be based on the same timescales. This will allow time for a strategy to be developed for the area and a comprehensive replacement scheme to be implemented to cover all aspects of the defences at Staithes (breakwaters and harbour walls) at the same time at the end of the 50 year appraisal period.

### 4.2 Long List of Options

- 4.2.1 The long list of options were derived during a site visit to Staithes taking into consideration the site constraints (technical, environmental and social) and the strategic context in terms of the previous scheme.
- 4.2.2 The baseline option for the option appraisal is the Do Nothing. The full list of options considered is:
- Option 1: Do Nothing – this is the ‘walk away’ option, no further maintenance or repair works would be carried out.
  - Option 2: Do Minimum – routine maintenance would continue, this would include inspections, remedial actions to maintain existing levels of health and safety, however no large scale repairs would be carried out.
  - Option 3: Wall Improvement Works – the existing harbour walls would be repaired. This is the Sustain Standard of Service (SoS) option.
  - Option 4: Replace Wall – the existing harbour walls would be replaced with a new structure along the existing alignment. This option has the potential for looking at changing the SoS for flooding from wave overtopping, which is currently 1 in 50 year standard of protection with the Phase 3 Harbour Improvement Scheme in place.

### 4.3 Options Rejected at Preliminary Stage

- 4.3.1 Option 2 Do Minimum has been rejected at the preliminary stage. As this option does not include any large scale repair works then the problems with the condition of the harbour walls will not be remedied and the probability of failure will not change. Therefore the harbour walls are likely to fail under the same

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timescales as for the Do Nothing, and there will be no benefits for the Do Minimum option.

4.3.2 Do Nothing is carried forward to the detailed appraisal as the baseline. Options 3 and 4 are both technically feasible and will reduce the Do Nothing damages and have therefore been carried forward. Option 3 can be considered to be the Sustain Standard of Service option, as it is the minimum amount of work that can be carried out to prevent the harbour walls from failing.

## **4.4 Options Short-listed for Appraisal**

4.4.1 The short listed options are:

### **Option 1: Do Nothing**

4.4.2 This is the baseline case against which the other options will be assessed. It is the 'walk away' option, no further maintenance or repair works would be carried out. The condition of the harbour walls would continue to deteriorate and the structures would fail within 4-8 years resulting in collapse of the walls and properties supported by the walls. Following collapse of the harbour walls coastal erosion would commence and further properties set back from the wall would collapse.

### **Option 3: Wall Improvement Works**

4.4.3 This is the Sustain Standard of Service (SoS) option. The existing harbour walls would be repaired to prolong the residual life of the existing assets and maximise the previous investments. Improvement works would include repairs to cracks, removal of vegetation, re-facing of concrete, re-pointing of masonry, in-filling of voids, replacement of damaged or missing masonry blocks, and placement of scour protection apron. The improvements would be targeted to areas where defects have been identified as posing a risk to the structural integrity of the walls. The improvement works would extend the residual life of the existing harbour wall assets until the end of the design life of the main breakwater works that were constructed as Phase 3 of the Staithes Harbour Improvements project.

### **Option 4: Wall Replacement**

4.4.4 The existing harbour walls would be replaced by a new structure. The new wall would be approximately 450m in length and vary in height to match the existing harbour walls. The new wall would be constructed in front of the existing wall, as the existing wall directly supports several properties it would not be possible to remove the existing wall and replace it along the exact alignment. The new wall would therefore encroach into the harbour to a small degree. The new wall would be reinforced concrete with a masonry facing. Some piling and/or ground anchors may be required dependant on ground conditions. The new wall would have a minimum design life of 50 years.

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# 5 Options Appraisal and Comparison

## 5.1 Technical Issues

### Option 3: Wall Improvement Works

5.1.1 This option is technically the most straight forward and has least risks associated with it. The types of improvements that will be carried out require simple methods and are easy to install. The equipment and machinery needed would be less than that for Option 4, and could be selected to ensure issues associated with access are minimised. In order to carry out the works access will be required to the foreshore and potentially to the top of the wall from the properties behind.

5.1.2 The Phase 3 Harbour Improvement Scheme recognised that additional works to the harbour walls would be required in the future; therefore the works proposed in Option 3 are in line with the anticipated future works of the previous scheme.

5.1.3 The improvement works will prolong the residual life of the existing harbour walls until the end of the design life of the main breakwater works that were completed in 2002 as Phase 3 of the Staithes Harbour Improvements project. This would allow a strategy to be developed in the interim that would address all of the issues at Staithes and Cowbar, and allow a holistic solution for the harbour to be implemented covering both the breakwaters and walls at same time. Option 3 would ensure that any potential future strategic options were not compromised.

5.1.4 Option 3 does not fundamentally change the existing structures and would not include any precautionary measures for climate change. As the residual life of the improved assets will be relatively short adaptation to climate change could be incorporated into the next major intervention at Staithes once the improvement works and the Phase 3 Harbour Improvement Scheme works reach the end of their design lives.

### Option 4: Wall Replacement

5.1.5 This option would be technically complex to carry out due to the proximity of the properties to the wall and the size of the wall to be replaced. The new wall would have to be constructed in front of the existing wall, it would not be possible to remove the existing wall and replace it along the exact same alignment as the existing wall directly supports several properties.

5.1.6 There would be significant risks associated with constructing a new large structure so close to properties and their supporting wall. There is potential for the properties to be damaged and for the existing walls to fail during the construction of the new wall, and so place properties at risk.

5.1.7 In addition there would be difficulties in getting the required plant and equipment to the site due to the steep narrow nature of the roads down to the harbour from the main road at the top of the cliff. Access to the foreshore is via a boat slipway which would again restrict the size of plant able to get to the site. As the walls surround a harbour there is potential for bringing materials and equipment in by sea, however it is a relatively small harbour and a proportion of the walls are along Staithes Beck which is a relatively small watercourse.

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5.1.8 Construction of a new wall would be very disruptive to the users of the harbour, including the RNLI, during the construction period and in addition the new wall would encroach into the harbour to a small degree potentially causing issues with moorings.

5.1.9 Construction of a new wall would potentially disturb sediment accumulations along the edges of the harbour. Mobilisation of sediment could result in potential contaminants trapped within the sediment being released.

5.1.10 The new wall would have a minimum design life of 50 years, potentially more, and therefore would outlast the Phase 3 Harbour Improvement Scheme works. This may create difficulties when developing a strategy and implementing any future holistic schemes.

5.1.11 The new wall could be designed to take either a precautionary or reactive approach to climate change. It would be difficult to design a precautionary scheme as the performance of the wall is linked to the Phase 3 Harbour Improvement Scheme which would reach the end of its design life before the new wall did. There would also be visual impacts of a higher wall. However, due to the access constraints and proximity of properties to the wall it will be a challenging construction environment, and therefore it would be difficult and high risk to adopt an adaptive approach that involved raising the wall in line with sea level rise at appropriate points. The approach to climate change for Option 4 would be investigated further if selected as preferred option.

## 5.2 Environmental Assessment

5.2.1 The potential key positive and negative environmental impacts of the detailed options being considered are presented in Table 5.1. Only the potential impacts that differ between the options are presented here, allowing for a comparison of each option's positive and negative impacts against each other. Mitigation measures and enhancement opportunities have also been proposed, where required.

5.2.2 The proposed scheme comprises improvement works to existing structures, with no new defences being proposed. As such, no adverse effects are anticipated to the status of the WFD water bodies present.

**Table 5.1 Comparison of key positive and negative environmental impacts of the alternative options**

Key Positive Impacts	Key Negative Impacts	Mitigation/ Enhancement Opportunity
<b>Option 1 – Do Nothing</b>		
Natural geomorphological evolution of Yorkshire North coastal waterbody permitted.	Continued deterioration of harbour walls leading to structural failure and loss of property and eventual damage to High Street.	
	The degradation and failure of the defences would likely result in significant health and safety issues to the local community and visitors.	
	The Cleveland Way trail adjacent to Staithes Harbour would be lost following collapse of the harbour walls.	
	The erosion of the frontage would have a significant impact on the local landscape / seascape character.	

Key Positive Impacts	Key Negative Impacts	Mitigation/ Enhancement Opportunity
	The existing visual amenity value would be reduced due to collapse of the harbour walls and property.	
	Listed buildings within the Staithes Conservation Area would be lost following structural failure of the defences.	
	The failure of the walls and subsequent erosion would affect the status of the WFD waterbodies, through the potential release of contaminated material and fines.	
	Adverse effects to Runswick Bay rMCZ through the potential release of contaminated material and fines.	
	Loss of tourism value.	
<b>Option 3 – Wall Improvement Works</b>		
Improvement works would prolong the residual life of the existing assets, delaying the time for capital works by 40 years.	Disturbance to residents and tourists through noise and vibration, and visual impacts.	Major works should be undertaken outside of peak tourism period.
Prolonging the residual life of the walls is considered to be more sustainable as the time between capital works is maximised.	Disturbance to nesting seabird colonies.	Major works should be undertaken outside of the seabird breeding period (February to mid-August).
This option would align the residual life of the assets with that of the breakwaters, allowing for a strategy to be developed in the interim that would address all of the issues at Staithes and Cowbar, and allow a holistic solution to be implemented.		Construction works should follow industry best practice guidance (i.e. PPG and CIRIA).
This option would ensure that any potential future strategic options were not compromised.		Production of a construction method statement will ensure suitable mitigation for construction works (e.g. materials to be used, timing of works, prevention of pollution, etc.)
<b>Option 4 – Wall Replacement</b>		
Long term coastal defence solution (min 50 years), protecting residential and commercial properties, and features of historic interest.	Potential for assets requiring urgent work to deteriorate further and collapse during the 2 year capital works period, leading to significant health and safety dangers to the public using the promenade, beach and road and risk to harbourside properties.	Construction works should follow industry best practice guidance (i.e. PPG and CIRIA).
	Significant disturbance to residents and tourists during construction.	Works should be undertaken outside of peak tourism period.
	Potential reduction in water quality due to the release of potentially contaminated sediment.	Major works should be undertaken outside of the kittiwake breeding period (February to mid-August).
	Significant effects to landscape / seascape character.	Production of a construction method statement will ensure suitable mitigation for construction works (e.g. materials to be used, timing of works, prevention of pollution, prevention etc.)
	Significant effects to Conservation Area.	A SWMP will be produced and implemented prior to the commencement of works.
	Significant disturbance to nesting seabird colonies	
	Residual life of existing walls not extended to their full potential, thus reducing the time between capital works.	
	Residual lives of the breakwaters and new walls not aligned, which could create difficulties when developing a strategy for future schemes.	

## 5.3 Option Costs

5.3.1 The construction costs for the Option 3 improvement works have been developed by Scarborough Borough Council's framework maintenance contractor (Transcore Ltd), to a March 2012 price date, these are based on framework rates and as such there is a high level of certainty. The design of the works and the site supervision will be undertaken by SBC's in-house technical team.

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5.3.2 Due to the type of works involved in the improvement works, primarily re-pointing, re-surfacing and toe works it is not anticipated that significant site investigation or will be required. However approximately 15 properties will require a Party Wall Notice and therefore survey, and it is possible that some of the property owners will object. An allowance of £15k has been made to cover the costs of the party wall surveys and dealing with objections.

5.3.3 There will not be any compensation costs. SBC are carrying out the works on behalf of the asset owners, who are the owners of the properties supported by the harbour walls. Therefore the asset owners will be foregoing compensation as payment in kind for the works. An allowance for consultation has been included in the SBC costs to cover the costs of liaising with the asset owners and holding a public consultation event.

5.3.4 Due to the type of works proposed for the improvement works there is little opportunity for any environmental enhancement works, as the works will repair the existing assets to the same appearance and form. The environmental mitigation measures outlined in Table 5.1 can be accomplished within the programming of the works and by following construction best practice methodologies and therefore there is not expected to be any additional costs over and above the construction costs required for mitigation measures.

5.3.5 The construction costs for Option 4 have been derived using the Environment Agency's Unit Cost Database (2010) based on 450m of reinforced concrete quay wall with a masonry facing. The fees and other costs have been derived using typical percentages of construction costs. The optimism bias applied to Option 4 is 60% due to the level of detail involved in the cost estimates. The cost estimates for Option 4 have not been developed in more detail due to them being significantly greater by an order of magnitude than the costs for Option 3. Therefore it would not be proportionate to carry out more detailed work on an option that is prohibitively expensive.

**Table 5.2 Summary of Options Present Value Costs (£k)**

	Option 3: Wall Repair Works	Option 4: Wall Replacement
Existing Staff Costs	9.5	142
Additional Staff Costs	0	0
Consultant fees	2.5	476
Contractor fees	0	47
Cost consultant fees	0	47
Site investigation & survey	15	238
Construction	85	4,511
Environmental mitigation	0	226
Environmental enhancement	0	90
Site supervision	5	451
Compensation	0	451
Risk contingency (XX%)	23	4,056
Other	0	0
<b>Sub Total</b>	140	10,735
Future costs (const. + maintenance)	41	80
<b>Total PV Cost</b>	181	10,815

## 5.4 Options Benefits (Damages Avoided)

5.4.1 Damages have been calculated using the Multi Coloured Manual (MCM) and the Green Book (HM Treasury, 2003). These documents have been used in combination with the Defra FCERM-AG series and Supplementary Guidance Notes. Figures in the Multi Coloured Manual have been updated to 4th Quarter (March) 2011-12 using the Consumer Price Index (CPI). Discount rates starting at 3.5% and reducing in line with Treasury guidelines have been applied.

5.4.2 Damages have been calculated for a 40 year appraisal period in order to tie into the appraisal period for the existing Phase 3 Harbour Improvement Scheme. This scheme had a 50 year appraisal period and was completed in 2002. This scheme forms the main coast protection works for Staithes and is integral to any works undertaken to the harbour walls. The scheme recognised that additional works to the harbour walls would be required in the future in order to realise the full potential benefits of the scheme. Therefore the benefits of the previous Phase 3 scheme and the works proposed in this PAR are inter-linked and need to be considered together along similar timescales.

5.4.3 The details of the benefits assessment can be found in Appendix F.

### Do Nothing

5.4.4 The damages that have been quantified are for loss of property due to coastal erosion. In order to ensure that double counting of benefits do not occur the properties included within the benefit area for the Phase 3 Harbour Improvement Scheme have been excluded from the damage assessment in this PAR. Of the 61 properties at risk of erosion 15 have been excluded as they are within the benefits area of the Phase 3 scheme.

5.4.5 The market value of the properties has been taken as the average values for the North Yorkshire region for January 2012 on the Land Registry website. These values have been discounted according to estimated year of loss, with properties either on or immediately behind the harbour walls being lost in years 4-8 and the remaining properties which are set further back lost by the end of the appraisal period. The limit of the area of benefit has been based on the Shoreline Management Plan 2 erosion lines, using the 50 year No Active Intervention scenario line.

5.4.6 There are other potential damages that would arise should the harbour walls fail, they have not however been quantified for the economic assessment in this PAR. Damages associated with the loss of the only access road to the harbour side part of the village and the loss of use of the harbour were included within the Phase 3 Harbour Improvement Scheme benefit assessment and have therefore been excluded from this PAR benefit assessment to avoid double counting.

5.4.7 Tourism and amenity benefits have not been quantified. Although there will a loss of income for the local economy of Staithes there are several other historic coastal fishing villages in the area and therefore tourism to the region is unlikely to be significantly affected. As the reduction in tourist income would be a local loss rather than a national loss it cannot be included as a quantified damage in the economic assessment.

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5.4.8 The total Do Nothing present value damages (PVd) for this PAR are £3,208k.

## Do Something

5.4.9 The Do Something damages were derived by delaying the year of loss of the properties by the expected design life of the option. As Option 3 will prolong the residual life of the harbour walls until the end of the appraisal period, and Option 4 will provide a new asset with a minimum design life of 50 years, both the Do Something options have no residual damages within the appraisal period. Therefore both options have the same benefits of £3,208k.

**Table 5.3 Summary of Present Value (PV) Damages and Benefits (£k)**

	Damage (PVd)	Damage Avoided	Benefits (PVb)	Key non-monetarised Benefits
Option 1: Do Nothing	3,208	-	-	
Option 3: Repair Walls	0	3,208	3,208	Tourism & amenity, use of harbour, road access
Option 4: Replace Walls	0	3,208	3,208	Tourism & amenity, use of harbour, road access

5.4.10

## 6 Selection and Details of the Preferred Option

### 6.1 Selecting the Preferred Option

6.1.1 A cost-benefit assessment (CBA) has been carried out for this PAR in accordance with the Flood and Coastal Erosion Risk Management Appraisal Guidance, with a Do Nothing baseline. A summary of the results are shown in Table 6.1.

6.1.2 From Table 6.1 it can be seen that Option 3: Wall Improvement Works is the only Do Something option with a positive benefit-cost ratio (BCR). The BCR for Option 3 is robust at 17.72 and has a significantly lower cost than Option 4, therefore this is the economically preferred option.

**Table 6.1 Benefit-Cost Assessment**

Option	PV Costs (£k)	PV Benefits (£k)	Av. Benefit/Cost Ratio
Option 1: Do Nothing	0	0	0
Option 3: Repair Walls	181	3,208	17.72
Option 4: Replace Walls	10,815	3,208	0.30

6.1.3

6.1.4 Technically, Option 3 is the least complex and has fewer risks associated with it. Option 3 also fits in better with the anticipated future works of the Phase 3 Harbour Improvement Scheme and the timescales for its design life. Option 3 will ensure that the benefits of the previous investment in the Phase 3 scheme are realised with minimal further investment.

6.1.5 The Do Nothing option would result in the continued deterioration of the harbour walls and their eventual failure, leading to a loss of the identified assets. The principal positive effect of Option 3 over Option 4 is the extension of the residual life of the sea walls by 20 years, thereby delaying the requirement for capital works and allowing for a holistic strategy to be developed. In addition, Option 3 would not affect the landscape / seascape and Conservation Area characters. For these reasons, Option 3 is the environmentally preferred option.

6.1.6 Option 3: Wall Improvement Works is the preferred option on economic, technical and environmental criteria.

### 6.2 Sensitivity Testing

6.2.1 There is a significant difference in the costs of the two Do Something options; Option 4 Replace Walls is 70 times more expensive than the preferred option. Option 3 is also the only option with a positive benefit cost ratio. Therefore it is extremely unlikely that any changes in the costs of the preferred option (Option 3) would impact on the choice of the preferred option.

6.2.2 The costs of the preferred option would have to increase by over 350% to £642k before the benefit cost ratio would drop below 5. As the construction costs have

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been determined by SBC's framework contractor it is extremely unlikely that the costs would increase by that amount.

6.2.3 A check has been carried out on the economics of the overall Staithes coast protection measures, both existing and proposed. The benefits presented in the Phase 3 Harbour Improvements Scheme Engineer's Report have been updated using Consumer Price Index from a base date of January 1999 to January 2012. The costs and benefits for the different phases of the works are presented in Table 6.2. The benefit-cost ratio (BCR) drops from to 3.45 when all phases of the coast protection measures are considered together. However this is still a positive benefit-cost ratio, and the repair works (Preferred Option 3) by themselves have a very robust BCR of 17.72.

**Table 6.2 Summary of economics for previous and proposed schemes**

Scheme	PV Benefits	PV Costs	Benefit-Cost Ratio
Phase 1 -3 Harbour Improvement Scheme	£11,354k	£4,044k	2.81
PAR Preferred Option (Option 3: Repair Walls)	£3,208k	£181k	17.72
Total	£14,562k	£4,225k	3.45

## 6.3 Details of the Preferred Option

### Technical Aspects

6.3.1 The preferred option, Option 3, consists of a series of improvement works to the existing harbour walls in order to extend their residual lives and maximise the longevity of the previous investments and ensure the potential benefits of the previous Phase 3 Harbour Improvements Scheme are realised.

6.3.2 The total length of harbour walls on the east side of Staithes Beck (within Scarborough Borough Council's boundary) is 510m. It is proposed that improvement works will be carried out to approximately 335m of the walls (~65%). The types of improvement works that will be undertaken are listed in Table 6.3. Details of the works proposed are included in Appendix D. The improvement works will be targeted at the priority sections where defects have been identified that threaten the structural stability of the harbour walls.

**Table 6.3 Proposed repair works**

Structure	Details	Amount
Concrete Walls	Prepare and grind out cracks to a minimum depth of 50mm and point using marine grade cementitious repair mortar. Where there is delamination of the concrete facing or render it will be removed and replaced	~50m of crack repairs ~70m <sup>2</sup> of re-facing works
Concrete Apron	Removal of existing loose concrete and other material and replace using mass concrete with minimum thickness of 300mm and dowel into existing structure.	~190m of concrete apron repairs
Toe Protection Works	Locally grout up voiding beneath existing scour protection. At the footbridge abutment a 1m wide concrete scour protection structure is to be constructed to match the opposite abutment.	~40m of toe protection repairs
Masonry Walls	Prepare and grind out pointing to coursed masonry walls to minimum depth of 50mm and point using a marine grade cementitious mortar. Where blocks are damaged or missing they will be replaced	~330m of masonry pointing repairs ~2.5m <sup>2</sup> of block replacement
Vegetation	Removal of any high level vegetation growing out of or through the walls.	~160m

6.3.3 As the preferred option minimises the amount of works that have to be carried out to the harbour walls the risks associated with working on the harbour walls are also reduced compared to other options considered. The key residual risks for the works and the methods of mitigation are:

- Access to the site, both through the village and onto foreshore – seek early consultation with Harbour Commission, Parish Council and Local Councillors;
- Proximity to properties – preferred option minimises the amount of work carried out adjacent to properties, and works should not adversely affect the structural integrity of the supporting walls during construction;
- Flooding, either fluvial or tidal, resulting in abortive work, damage to recent repairs, or delays – review weather and tide data on frequent basis, and implement temporary measures to reduce this risk where possible; and
- Interaction with public, harbour users, RNLI, and tourists – public consultation event will be held prior to construction starting to inform community and harbour users of the works, project information board will be erected at start of construction and maintained.

6.3.4 The works proposed will not change the existing outfalls through the harbour walls and will therefore not provide any opportunities to influence the bathing water quality. The locations of the outfalls and evidence of frequency of use will be recorded and passed on to the relevant authority (Revised Bathing Water Directive Partnership) dealing with the bathing water quality at Staithes harbour.

## Environmental Aspects

6.3.5 Given the nature and location of the proposed scheme, the following aspects are considered relevant:

- Coastal processes;
- Biodiversity, flora and fauna;
- Noise and vibration;
- Water;
- Archaeology and cultural heritage;
- Landscape, seascape and visual amenity value; and,
- Tourism and recreation.

6.3.6 In addition to the receptor specific measures set out below to avoid / mitigate any adverse effects that could arise through the implementation of the preferred option, best practice guidance will be adhered to, in particular:

- Pollution Prevention Guidelines - Works in, near or liable to affect watercourses: PPG 5 (EA 2007);
- CIRIA Coastal and Marine Environmental Management Site Guide (CIRIA report C584) (CIRIA 2003); and,
- CL:AIRE (Contaminated Land: Applications in Real Environments) Code of Practice.

6.3.7 The preferred option is considered to have a negligible effect on the existing coastal processes due to the small changes to the existing defences. Major

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works, those to the stone leaf and bridge abutment, are considered to have the potential to disturb breeding seabirds on Cowbar. In order to avoid this, these works are proposed to be undertaken outside of the breeding period (February to mid-August). In addition to this and the recommended measures to minimise any adverse noise and vibration impacts (see below), the proposed works are considered to have a negligible effect on breeding seabirds.

6.3.8 In addition to the potential presence of breeding birds, there are a number of commercial and residential properties within close proximity to the proposed works. The beach area surrounding the proposed works is also a popular location for beach based activities. The most significant noise and vibration impacts would result from the breaking out of any existing walls, where required, and delivery of materials. In order to minimise potential noise and vibration impacts to sensitive receptors, the following best practice measures are recommended:

- ensure plant machinery is switched off when not in use;
- ensure that covers and hatches are properly secured and that there are no loose fixings causing rattling;
- ensure equipment is properly maintained and operated by trained staff;
- use silenced equipment where possible, in particular silenced generators; and,
- provide local residents with contact details of a site representative in the event that noise or vibration nuisance is perceived, and that any complaints are dealt with pro-actively and resolutions communicated to the complainant.

6.3.9 The proposed scheme comprises improvement works to existing structures, with no new defences being proposed. The extension to the defence line was described previously in Section 5.1. This change to the coastal waterbody's geomorphology is considered to be negligible.

6.3.10 Potential adverse effects to the coastal and river waterbodies could result through accidental spills and leakages and through the release of contaminants used for the repair works. Excavation works, in particular those to repair the stone leaf and bridge abutment, are considered to be minimal; however, there is the potential for the release of material with a high organic content. Due to the relatively small amount of material to be removed and the volume of water that flows into the harbour during high tide, any effects are considered to be minor. Works will ensure that disturbance to sediments are kept to a minimum.

6.3.11 Only material approved for use in the marine environment will be used for the improvement works. In addition to this, best practice and pollution prevention guidance will be adhered to throughout the duration of the scheme. As such, no adverse effects are anticipated to the status of the WFD waterbodies present.

6.3.12 The improvement works will temporarily affect the local landscape / seascape character and amenity value. In addition to adhering to best practice guidance, the following measures are proposed to minimise any adverse effects:

- locally advertising the proposed works;
- conducting the works outside of the peak tourism period; and,
- informing local residents of the proposed works.

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- 6.3.13 The improvement works have the potential to effect recreational users of the area through increased noise and vibration, increased traffic, reduced access to the beach and visual impacts. With the avoidance and mitigation measures proposed for noise and vibration, and landscape, seascape and visual amenity value, the potential adverse effects to tourism and recreation are considered to be minor.

## Costs for the Preferred Option

- 6.3.14 The construction costs for the Option 3 Wall Improvement Works have been developed by Scarborough Borough Council's framework maintenance contractor (Transcore Ltd), to a March 2012 price date, these are based on framework rates and as such there is a high level of certainty. Figures do not include inflation as the construction will be carried out by SBC's framework contractor on already agreed framework rates. A breakdown of the construction costs can be found in Appendix G. The design of the works and the site supervision will be undertaken by SBC's in-house technical team. An allowance for the CDM-Coordinator has been included.
- 6.3.15 Due to the type of works involved in the improvement works, primarily re-pointing, re-surfacing and toe works it is not anticipated that significant site investigation or will be required. Party Wall surveys for 15 properties will be required and an allowance of £15k has been made for this and to cover costs of dealing with any objections to the Party Wall Notices.
- 6.3.16 There will not be any compensation costs. SBC are carrying out the works on behalf of the asset owners, who are the owners of the properties supported by the harbour walls. Therefore the asset owners will be foregoing compensation as payment in kind for the works. An allowance for consultation has been included in SBC costs to cover the costs of liaising with the asset owners and holding a public consultation event.
- 6.3.17 Due to the type of works proposed for the improvement works there is little opportunity for any environmental enhancement works, as the works will repair the existing assets to the same appearance and form. The environmental mitigation measures outlined in Table 5.1 can be accomplished within the programming of the works and by following construction best practice methodologies and therefore there is not expected to be any additional costs over and above the construction costs required for mitigation measures.
- 6.3.18 Future maintenance costs have been based on two members of staff carrying out maintenance duties for one day a year plus materials (£1k a year), and in addition annual asset inspections (£0.6k a year). These costs have been applied every year following construction until the end of the appraisal period.

**Table 6.4 Project Costs for Preferred Option (£k)**

	Cost for economic appraisal (PV)	Whole life cash cost	Capital Grant approval project cost
<b>Costs to PAR: (excluding costs of approved study)</b>			
Existing Staff costs	Sunk Costs	3	
Additional Staff costs	Sunk Costs	0	
Site investigation & survey	Sunk Costs	0	
Consultant fees	Sunk Costs	17	
Contractor fees	Sunk Costs	0	
Cost consultant fees	Sunk Costs	0	
<b>Sub-total</b>	Sunk Costs	<b>20</b>	<b>20</b>
<b>PAR to Construction:</b>			
Existing Staff costs	2	2	2
Additional Staff costs	0	0	0
Site investigation & Survey	15	15	15
Consultant fees	0	0	0
Contractor fees	0	0	0
Cost consultant fees	0	0	0
Other costs	4.5	4.5	4.5
<b>Sub-total</b>	<b>21.5</b>	<b>21.5</b>	<b>21.5</b>
<b>Construction:</b>			<b>0</b>
Construction costs	85	85	85
Inflation allowance for * months			0
Environmental enhancement	0	0	0
Environmental mitigation	0	0	0
Existing Staff costs	3	3	3
Additional Staff costs	0	0	0
Consultant fees	2.5	2.5	2.5
Site supervision	5	5	5
Cost consultant fees	0	0	0
Compensation	0	0	0
Other costs)	0	0	0
<b>Sub-total</b>	<b>95.5</b>	<b>95.5</b>	<b>95.5</b>
<b>Future Costs:</b>			
Maintenance	41	75	
Future construction	0	0	
<b>Risk Contingency:</b>			
Monte Carlo 95% or similar			23
Monte Carlo 50% or similar	23	23	
<b>Contributions</b>			
<b>TOTAL</b>	<b>181</b>	<b>235</b>	<b>140</b>

## Contributions and Funding

6.3.19 Partnership Funding is all about seeking contributions towards the scheme to reduce the reliance on FDGiA. The Staithes Urgent Harbour Wall repairs are a very cost efficient way of providing some protection for the properties. The beneficiaries of the scheme are mainly residential properties, and there are no majority or significant beneficiaries, therefore a contribution from the residents is not required. It is recommended that for any future longer term work the risk

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management authorities involved work with the communities to establish a sustainable way of funding and maintaining any future works

- 6.3.20 Scarborough Borough Council will continue to maintain the harbour walls, providing the £41k maintenance costs over the 40 year residual life of the assets (£1.6k per year).

## Outcome Measures and Funding Priority

- 6.3.21 The Staithes Urgent Harbour Walls Improvement Scheme was part of a Flood Defence Grant in Aid bid for funding in 2012-13. This year of funding is considered a transitional year due to the introduction of Partnership Funding. The scheme did qualify for FDGiA but because it did not have an approved business case it was pushed back for an allocation in this current financial year.
- 6.3.22 Due to the urgent nature of the works the Yorkshire Regional Flood and Coastal Committee considered that alternative funding in the form of the Local Levy should be used to ensure that the project could be carried out this year to reduce costs should further erosion occur. This was also agreed at the North Yorkshire Strategic Partnerships. The purpose of the Strategic Partnerships is to agree local priorities to direct resources and funding. Staithes Urgent Harbour Wall Improvements Scheme was considered a priority for the partnership.
- 6.3.23 The Partnership Funding calculator in Appendix F shows that the Partnership Funding Score is 462%. The threshold for FDGiA funding last year was 120%. This project clearly demonstrates excellent value for money.
- 6.3.24 The scheme qualifies for FDGiA therefore if an opportunity comes forward within 2012-13 to transfer the spend to this source of funding then the funding will be changed and the Local Levy funding returned as balances can be carried over.

**Table 6.5 Outcome Measure Contributions and Prioritisation Score**

Outcome Measures		Number	Qualifying Benefits	FDGiA Contribution
OM1 (Economic Benefit)			£518k	£29k
OM2 (Households better protected against flooding)	20% most deprived areas	0	£0	£0
	21-40% most deprived areas	0	£0	£0
	60% least deprived areas	0	£0	£0
OM3 (Households better protected against coastal erosion)	20% most deprived areas	0	£0	£0
	21-40% most deprived areas	58	£2,690k	£807k
	60% least deprived areas	0	£0	£0
OM4 (Statutory Environmental Obligations Met)			£0	£0
TOTAL FDGiA Contribution				<b>£836k</b>
Raw OM Score				461.80%
Cost saving and/or external contribution required				£0k
Scheme Contributions Secured				£41k
Adjusted OM Score				484.46%
FDGiA required for next phase				£140k

# 7 Implementation

## 7.1 Project Planning

### Phasing and Approach

7.1.1 Following receipt of funding approval the works information will be finalised. During this period consultation with the public and directly affected property owners will be carried out so that they are aware of the scheme programme and proposed works. The surveys and notices for the Party Wall Agreements will also be carried out during this period. These need to be in place before the works can start on site.

7.1.2 Once the works information is finalised the contract will be awarded. The improvement works will be carried out by Scarborough Borough Council's framework maintenance contractor. The design and site supervision of the works will be carried out in-house by SBC's technical team.

### Programme and Spend Profile

7.1.3 Following receipt of funding allocation the works information will be completed and the contract awarded using the SBC framework maintenance contractor. North York Moors National Park has confirmed that planning permission is not required (Appendix J).

7.1.4 Construction is programmed to start in September 2012 (detailed programme in Appendix H). Construction is programmed to last 5.5 months and be completed within the financial year.

7.1.5 The works to the abutments of the footbridge and replacement of missing blockwork at the upstream end of the study area are programmed to be carried out first in order to be completed before the kittiwake breeding season (February to mid-August). The remaining construction works are not constrained by the kittiwake breeding season.

7.1.6 The Yorkshire Regional Flood and Coastal Committee considered that alternative funding in the form of the Local Levy should be used to ensure that the project could be carried out this year. The expenditure profile is shown in Table 7.2.

**Table 7.1 Key Dates**

Activity	Date
Planning permission received	Not required
Works start on site on	24/9/2012
Works substantially complete by	1/3/2013

**Table 7.2 Annualised Spend Profile (£k)**

	2012/13	2013/14	2014/15	2015/16	2016/17	Future Years	Total
Existing Staff costs	9.5						
Additional Staff costs	0						0
Fees	22.5						22.5
Construction	85						85
Environmental mitigation	0						0
Environmental enhancement	0						0
Compensation	0						0
Other	0						0
Risk contingency (20% risk)	23						23
Less non grant eligible costs	0	1.9	1.9	1.9	1.9	67.2	75
Grant Rate							
<b>Total grant eligible sum *</b>	<b>140</b>						<b>*140</b>

Figures do not include inflation as construction proposed 2012/13 and costs are based on agreed framework rates.

## 7.2 Delivery Risks

### High Level Risk Register

7.2.1 The key delivery risks are outlined in Table 7.3, the risk register (Appendix I) has been developed by the project team. The risk allowance of £23k is based on an optimism bias of 20%.

**Table 7.3 High Level Risk Schedule and Mitigation**

Key Project Risk	Adopted Mitigation Measure
Extent of improvements required is greater than anticipated	<ul style="list-style-type: none"> <li>Improvements required are based on visual inspections carried out in 2010 when beach levels were very low.</li> <li>A 20% contingency for the repair works has been identified within the funding application to allow for unforeseen scope changes.</li> </ul>
Weather and Tidal conditions result in delays to programme	<ul style="list-style-type: none"> <li>Contract used with framework contractor does not allow for claims for weather or tidal delays. Works are carried out on a re-measure basis, therefore there is a risk of additional costs for scope changes from unforeseen ground conditions or extent of repairs, but not from weather or tidal delays to programme.</li> </ul>
Access to site for equipment or deliveries is unexpectedly obstructed resulting in delays to the programme	<ul style="list-style-type: none"> <li>Access routes to be agreed prior to start of construction.</li> <li>Deliveries to be carefully programmed.</li> </ul>

### Safety Plan

7.2.2 The key roles under CDM are as follows:

CDM-Co-ordinator	Turner & Townsend
Client	Scarborough Borough Council
Principal Contractor	Transcore Ltd

7.2.3 Public safety will be assessed in line with Scarborough Borough Council's procedures prior to the start of construction.

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**Appendix A****Project Report Data Sheet**

Entries required in clear boxes, as appropriate.

**GENERAL DETAILS**

Authority Project Ref. (as in forward plan):

YOS351C/001A/045A

Project Name  
(60 characters  
max.):

Staithes Urgent Harbour Wall Improvement Scheme

Promoting Authority: Defra ref (if known)  
Name

Scarborough Borough Council

Emergency Works:

No

Yes/No

Strategy Plan Reference:

River Basin Management Plan

System Asset Management Plan

Shoreline Management Plan:

River Tyne to Flamborough Head  
SMP2

Project Type:

Stand-alone Project. Coast Protection

Shoreline Management Study/ Preliminary Study/ Strategy Plan/Prelim. Works to Strategy/ Project within Strategy/Stand-alone Project/  
Strategy Implementation/Sustain STANDARD OF SERVICE. 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:

Sept-2012

Estimated duration in months:

7 months

Contract type\*

Framework

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

**Costs**

PAR Preparation:

APPLICATION (£000's)

£20k

Capital Grant for Environment

£140k

Agency approval:

Total Whole Life Costs (cash):

£235k

For breakdown of costs see Table in Section 2.4

**CONTRIBUTIONS**

Own Resources:

£41k (ongoing maintenance)

Windfall Contributions:

Deductible Contributions:

Loans:

ERDF Grant:

Other excluded Items:

**LOCATION – to be completed for all projects**

EA Region/Area of project site (all projects):

North-East Region

Name of watercourse (fluvial projects only):

Staithes Beck

District Council Area of project (all projects):

Scarborough Borough Council

Grid Reference (all projects):

NZ785189

(OS Grid reference of typical mid point of project in form ST064055)

## DESCRIPTION

Specific town/district to benefit:

Staithes

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

The aim of the works is to sustain the current standard of service provided by the existing coast defence assets in Staithes, whilst maximising the longevity of the previous investments.

The improvement works will be targeted at the priority sections where defects have been identified that threaten the structural stability of the harbour walls. The types of improvement works that will be undertaken include toe protection works, repointing, re-facing of concrete walls and apron, and removal of high-level vegetation.

## DETAILS

Design standard (chance per year):

Sustain SoS

yrs

Existing standard of protection (chance per year)

1 in 50

yrs

Design life of project:

40

yrs

Fluvial design flow (fluvial projects only):

n/a

m<sup>3</sup>/s

Tidal design level (coastal/tidal projects only):

n/a

m

Length of river bank or shoreline improved:

335m

m

Number of groynes (coastal projects only):

n/a

Total length of groynes\* (coastal projects only):

n/a

m

Beach Management Project?

No

Yes/No

Water Level Management (Env) Project?

No

Yes/No

Defence type (embankment, walls, storage etc)

Harbour walls

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

## ADDITIONAL AGREEMENTS:

Maintenance Agreement(s):

Received

Not Applicable/Received/Awaited

EA Region Consent :

Not Applicable/Received/Awaited

Non Statutory Objectors:

No

Yes/No (For coastal schemes complete CPA1/CPA2)

Date Objections Cleared:

Other:

Not Applicable/Received/Awaited

## ENVIRONMENTAL CONSIDERATIONS

Natural England (or equivalent) letter:

Received

Not Applicable/Received/Awaited

Date received

3/5/2012

## SITES OF INTERNATIONAL IMPORTANCE

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

Special Protection Area (SPA):

No

Yes/No

Special Area of Conservation (SAC):

No

Yes/No

Ramsar Site

No

Yes/No

World Heritage Site

No

Yes/No

Other (Biosphere Reserve etc)

No

Yes/No

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

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

**OTHER ENVIRONMENTAL CONSIDERATIONS**

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

**COMPATIBILITY WITH OTHER PLANS**

Shoreline Management Plan	Yes	Yes/No/Not Applicable
River Basin Management Plan	n/a	Yes/No/Not Applicable
Catchment Flood Management Plan	n/a	Yes/No/Not Applicable
Water Level Management Plan	n/a	Yes/No/Not Applicable

**SEA/ENVIRONMENTAL IMPACT ASSESSMENT**

SEA	n/a	Statutory required/ voluntary/not applicable
EIA	n/a	Yes (schedule 1); Yes (schedule 2); SI1217; not applicable
SEA/EIA status	n/a	Scoping report prepared/draft/draft advertised/final

Other agreements	Detail	Result	(Not Applicable/Received/Awaited for each)

**Costs, benefits & 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:	0.7	Ha
of which present use is:	FRM	CERM
Agricultural:	0	Ha
Developed:	0.7	Ha
Environmental/Amenity:	0	Ha
Scheduled for development	0	Ha

## PROPERTY & INFRASTRUCTURE PROTECTED

	Number		Value (£'000s)	
	FRM	CERM	FRM	CERM
<sup>1</sup> Residential		44		5,655
Commercial/industrial		2		183
Critical Infrastructure				
Key Civic Sites				
Other (description below):				
Description:				

## Costs and Benefits

<sup>1</sup>Present value of total project whole life costs (£'000s): Include all costs including ineligible Project to meet statutory requirement? Y/N

181

N

Present value of residential benefits:  
Present value of commercial/industrial benefits:  
Present value of public infrastructure benefits:  
Present value of agricultural benefits:  
Present value of environmental/amenity benefits:

<sup>1</sup>Present value of total benefits (FRM & CERM)

Net present value:

Benefit/cost ratio:

Base date for estimate:

PAG Decision Rule stage 3 applied

PAG Decision Rule stage 4 applied

Value (£'000s)

FRM

CERM

3,158

50

3,208

3,027

17.72

Q1 2012

No

Yes/No

No

Yes/No

## OTHER OUTCOME MEASURE SCORING DETAILS

Super Output Area No\*: 25.26

Indicate if deprived: Yes Yes/No

(\*as ranked by Indices of Multiple Deprivation)

Risk: n/a VH, H or N/A

Net gain of BAP habitat:

Wetland

Saltmarsh/  
Mudflat

0

0

ha

SSSI protected:

0

ha

Other Habitat:

0

ha

Heritage Sites:

0

"I or II", "II or other" or "N/A"

## Exemption Details (if exempt from OM scoring system)

Exempt from Scoring: Yes/No

Reason (max 100 chars):

## **Appendix B    List of Reports Produced**

The following reports previously produced for other projects support the business case presented in this PAR:

- River Tyne to Flamborough Head Shoreline Management Plan 2. (Royal Haskoning, 2007)
- Staithes Harbour Phase 3 Improvements Engineers Report in Support of an Application for Grant Aid to the Ministry of Agriculture, Fisheries & Food (High Point Rendel, January 1999)
- Staithes Harbour Improvements and Cowbar Coast Protection and Cliff Stabilisation – Environmental Statement (High Point Rendel, September 2000)
- The Coast Protection Assets and Coastal Slope Condition Analysis Report (Halcrow, March 2010)
- Cell 1 Monitoring: Scarborough Asset Inspection. (Royal Haskoning, September 2010)