# Staithes Harbour Wall Improvements PAR

Economic Assessment

Scarborough Borough Council

23rd May 2012
Final Report
9X1732

ROYAL HASKONING
Enhancing Society

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| Status | Final Report |
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| Project name | Staithes Urgent Harbour Wall Improvements PAR |
| Project number | 9X1732 |
| Client | Scarborough Borough Council |
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| | | |
|---|---|---|
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| Approved by | Nick Cooper | |
| Date/initials approval | …….. | …….. |

**CONTENTS**

# 1 INTRODUCTION

## 1.1 Purpose of Report

The purpose of this report is to outline the methodology used for the economic assessment for the Staithes Harbour Wall Improvements Project Appraisal Report (PAR).

## 1.2 Background

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).

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.
- 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.

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.

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.

# 2 METHODOLOGY

## 2.1 General

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 (January) 2011/12 using the Consumer Price Index (CPI).

## 2.2 Appraisal Period

Damages have been calculated over a 40 year appraisal period and discount rates starting at 3.5% and reducing to 3.0% at year 30 have been applied.

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. The options being considered by the PAR are aimed at providing a medium term solution to the condition issues of the harbour walls in order to prolong their residual lives until the Phase 3 Harbour Improvement Scheme reaches the end of its design life. 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.

The Phase 3 Harbour Improvement Scheme had a 50 year appraisal period and was completed in 2002, giving a design life end date of 2052. 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

## 2.3 Risk Area

The area at risk has been determined using information from the Shoreline Management Plan 2[1] (SMP2), the Phase 3 Harbour Improvement Scheme[2], asset inspections, and a site walkover. The benefits area for the economic assessment for the PAR is shown in Appendix A.

From the asset inspections and site walkover the extent of the harbour walls at potential risk of failure were identified. The properties either directly supported by the harbour walls or immediately behind the walls are likely to be lost as the harbour walls fail and collapse. They have therefore been allocated to the risk band of 4-8 years; this time frame correlates to the residual life assigned to the assets in the 2010 asset inspection[3].

The Do Nothing erosion lines from the SMP2 (Appendix A) were used to identify additional properties that are slightly set back from the harbour walls which would also become at risk. The 50 year erosion line was used for this purpose. The SMP2 erosion

[1] River Tyne to Flamborough Head Shoreline Management Plan 2 (2007)
[2] Staithes Harbour Phase 3 Improvements Engineers Report in Support of an Application for Grant Aid to the Ministry of Agriculture, Fisheries & Food (January 1999)
[3] Coast Protection Assets and Coastal Slope Condition Analysis (March 2010).

lines do not extend as far up Staithes Beck as the extent of the harbour walls at risk of failure. Therefore the erosion line has been extended assuming the same rate of erosion as for the 50 year Do Nothing SMP2 erosion line. These properties were assigned a loss date of year 40 (end of appraisal period).

In order to ensure that double counting of benefits does not occur with the Phase 3 Harbour Improvements Scheme properties that were within the Phase 3 benefits have been excluded from the calculation of damages. The benefit areas for flooding and coastal erosion used in the calculation of the benefits for the Phase 3 Harbour Improvements Scheme are shown in Appendix A.

## 2.4 Property

The National Receptor Dataset (NRD) has been used to identify the number and type of residential and commercial properties affected within the at risk area, as shown in Table 1. There are 58 residential properties potentially at risk of erosion in Staithes should the harbour walls fail, of these 14 were included in the Phase 3 Harbour Improvements Scheme benefit assessment and so have been excluded from the PAR economic assessment. There are 3 commercial properties potentially at risk, of these 1 was included in the Phase 3 benefit assessment and so has been excluded.

**Table 1.** Properties at risk of coastal erosion due to failure of harbour walls in Staithes

| Risk Band | Residential | Commercial | Total |
|---|---|---|---|
| Years 4-8 (PAR benefit area) | 24 | 0 | 24 |
| Year 40 (PAR benefit area) | 20 | 2 | 22 |
| Years 4-8 (Phase 3 benefit area)* | 4 | 0 | 4 |
| Year 40 (Phase 3 benefit area)* | 10 | 1 | 11 |
| **Total** | **58** | **3** | **61** |

* Properties at risk of coastal erosion due to failure of the harbour walls that are within the Phase 3 Harbour Improvements Scheme benefits area have been excluded from the economic assessment for the PAR.

Market values for the residential properties have been assigned to the properties according to type of property using the most up to date data (January 2012) on the Land Registry website for the North Yorkshire region, as shown in Table 2.

**Table 2.** Average house prices for North Yorkshire, December 2011 (www.landregistry.gov.uk)

| Property Type | Average Value |
|---|---|
| Detached | £264,608 |
| Semi-Detached | £150,340 |
| Terrace | £126,863 |
| Flat | £121,011 |
| ALL | £169,975 |

Market values for the commercial properties have been derived using the bulk class rateable values. The MCM codes assigned in the NRD were used to assign a bulk class. The rateable values for the Scarborough Local Authority area[4] were applied to the floor area of the commercial properties listed in the NRD, and multiplied by 10 to get a market value in line with the methodology in the MCM.

[4] Commercial and Industrial Floorspace and Rateable Value Statistics (2005 Revaluation) 2008 (www.neighbourhood.statistics.gov.uk)

The property damages were discounted according to their assigned year of loss. The properties immediately at risk following the failure of the harbour walls have an assigned loss of years 4-8; therefore the damages for these properties were given a 20% chance of occurring in each year in the year 4-8 band.

The damage calculation spreadsheets can be found in Appendix B.

## 2.5 Tourism & Amenity

The Phase 3 Harbour Improvements Scheme acknowledged that there may be tourism and amenity losses arising under the Do nothing scenario, however they were not quantified.

Tourism is an important source of income for Staithes, with a relatively high proportion of property within the village offering holiday accommodation. Staithes is attractive to tourists due to its quiet seaside location and historic fishing village character; there is also a connection to Captain Cook which the village trades on. However Staithes is not a totally unique setting along the North Yorkshire coastline, with similar villages being in the local vicinity, such as Runswick Bay.

Failure of the harbour walls under the Do Nothing scenario is likely to result in a reduction in tourism to Staithes due to loss of access to the foreshore, and destruction of the character of the village due to loss of the historic harbour-side properties. However this loss is likely to be local to Staithes, with tourists switching to other locations along the North Yorkshire coast. Therefore the loss of tourism revenue would not be a national loss and as such it has not been quantified to be included within the PAR economic assessment.

## 2.6 Traffic Disruption

The Phase 3 Harbour Improvements Scheme identified that erosion due to a breach of the harbour walls would result in the loss of the only access road to the harbour-side part of the village. To avoid double counting of benefits this damage source has been excluded from the PAR economic assessment.

## 2.7 Harbour Usage

The Phase 3 Harbour Improvements Scheme looked at the damages associated with loss of harbour usage. £3.6M of damages were identified due to the inability to use the harbour for fisheries and recreational usage following breakwater failure. This value was derived from figures provided by the Harbour Commissioner and the local community and based on 10 years of losses until the industries became established elsewhere.

As this source of damages was included within the Phase 3 Harbour Improvements Scheme no damages for loss of harbour function have been included within the economic assessment for the PAR to ensure double counting of benefits is avoided.

# 3 DAMAGE ASSESSMENT RESULTS

The results of the damage assessment for the Staithes Urgent Harbour Wall Improvements PAR are shown in Table 3 for the cash values of the different damage receptors. These values have then been used for the probabilistic determination of the Present Value Damages. The present value damages for the PAR economic assessment are also shown in Table 3.

**Table 3.** Damages for Do Nothing Scenario

| Damage Receptor | Cash Value Damages | Present Value Damages |
|---|---|---|
| Residential Property | £5,655k | £3,158k |
| Commercial Property | £183k | £50k |
| **TOTAL** | **£5,838k** | **£3,208k** |

The Do Something options being considered will prevent the harbour walls failing within the appraisal period, and therefore will avoid all of the Do Nothing damages.

# 4 COST-BENEFIT ASSESSMENT

A cost-benefit assessment (CBA) has been carried out for this project in accordance with the Flood and Coastal Erosion Risk Management Appraisal Guidance. A summary of the results are shown in Table 5. The baseline for a CBA is the Do Nothing, defined as the walk away option. The other options being considered are the Do Minimum, and two Do Something options.

**Table 4.** Summary of Cost-Benefit Analysis

| Option | | PV Damages | PV Benefits | PV Costs | BCR | Incremental BCR | Net Present Value |
|---|---|---|---|---|---|---|---|
| 1 | Do Nothing | £3,208k | - | - | - | - | - |
| 2 | Do Minimum | £3,208k | £0k | £50k | 0 | - | -£50k |
| 3 | Wall Improvement Works | £0k | £3,208k | £181k | 17.72 | - | £3,027k |
| 4 | Wall Replacement | £0k | £3,208k | £10,815k | 0.3 | - | -£7,651k |

From Table 4 it can be seen that Option 3 is the only option with a positive benefit-cost ratio. It is also significantly less expensive than the other Do Something option of replacing the harbour walls (Option 4).

Option 3: Wall Improvement Works is therefore the economically preferred option.

# 5 FDGIA CALCULATOR

The study area is covered by one Lower Super Output Areas (LSOA), which has an Index of Multiple Deprivation rank within the 40% most deprived band used within the FDGiA Partnership Funding calculator, as shown in Table 5.

**Table 5.** Index of Multiple Deprivation (IMD) for Study Area

| LSOA Code | LSOA Name | IMD Rank | IMD Score | No. Residential Properties (Households) | |
|---|---|---|---|---|---|
| | | | | Included within PAR Benefit Area | Included within Phase 3 Harbour Improvements Scheme Benefit Area |
| E01027840 | Scarborough 002C | 10,519 | 25.26% | 44 | 14 |

The present value whole life costs of the preferred option are £181k, and the cash costs of the next phase (design, consultation, construction and site supervision) are £140k including 20% optimism bias.

It is anticipated that the project will be funded by Local Levy contributions, and £140k has been provisionally allocated to the project. However should FDGiA funding become available, the Local Levy funding would be returned. It is anticipated that Scarborough Borough Council will continue to maintain the harbour walls for the rest of the 40 year appraisal period and will therefore contribute the £41k required for maintenance over that period.

A summary of the FDGiA Partnership Funding calculator is shown in Table 6 and the output from the spreadsheet is included in Appendix C.

**Table 6.** Summary of Outcome Measures and FDGiA Partnership Funding Calculator

| Outcome Measures | | Number | Qualifying Benefits | FDGiA Contribution |
|---|---|---|---|---|
| OM1 (Economic Benefit) | | | £518k | £29k |
| OM2 (Households better protected against flooding) | 20% most deprived areas | | | |
| | 21-40% most deprived areas | | | |
| | 60% least deprived areas | | | |
| OM3 (Households better protected against coastal erosion) | 20% most deprived areas | | | |
| | 21-40% most deprived areas | | £2,690k | £807k |
| | 60% least deprived areas | | | |
| OM4 (Statutory Environmental Obligations Met) | | | | |
| TOTAL FDGiA Contribution | | | | **£836k** |
| 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** |

# Appendix A

## Figures

- **PAR Benefit Area**
- **SMP2 Erosion Lines**
- **Extract from Staithes Harbour Improvements Phase 3 Engineer's Report (1999)**

N

Yr 6-10 New

Yr 50 New

Yr 6-10 Previous Scheme

Yr 50 Previous Scheme

Limits for flooding damages from Phase 3 Harbour Improvements Scheme

Limits for erosion damages from Phase 3 Harbour Improvements Scheme

Metres
0 25 50 100

Title:
Properties at Risk

Project:
Staithes Harbour Wall Improvements

Client:
Scarborough Borough Council

| Date: | Scale at A3: |
|---|---|
| April 2012 | 1:1,500 |

| Figure: | Drawn: | Checked: |
|---|---|---|
| 1 | TC | EH |

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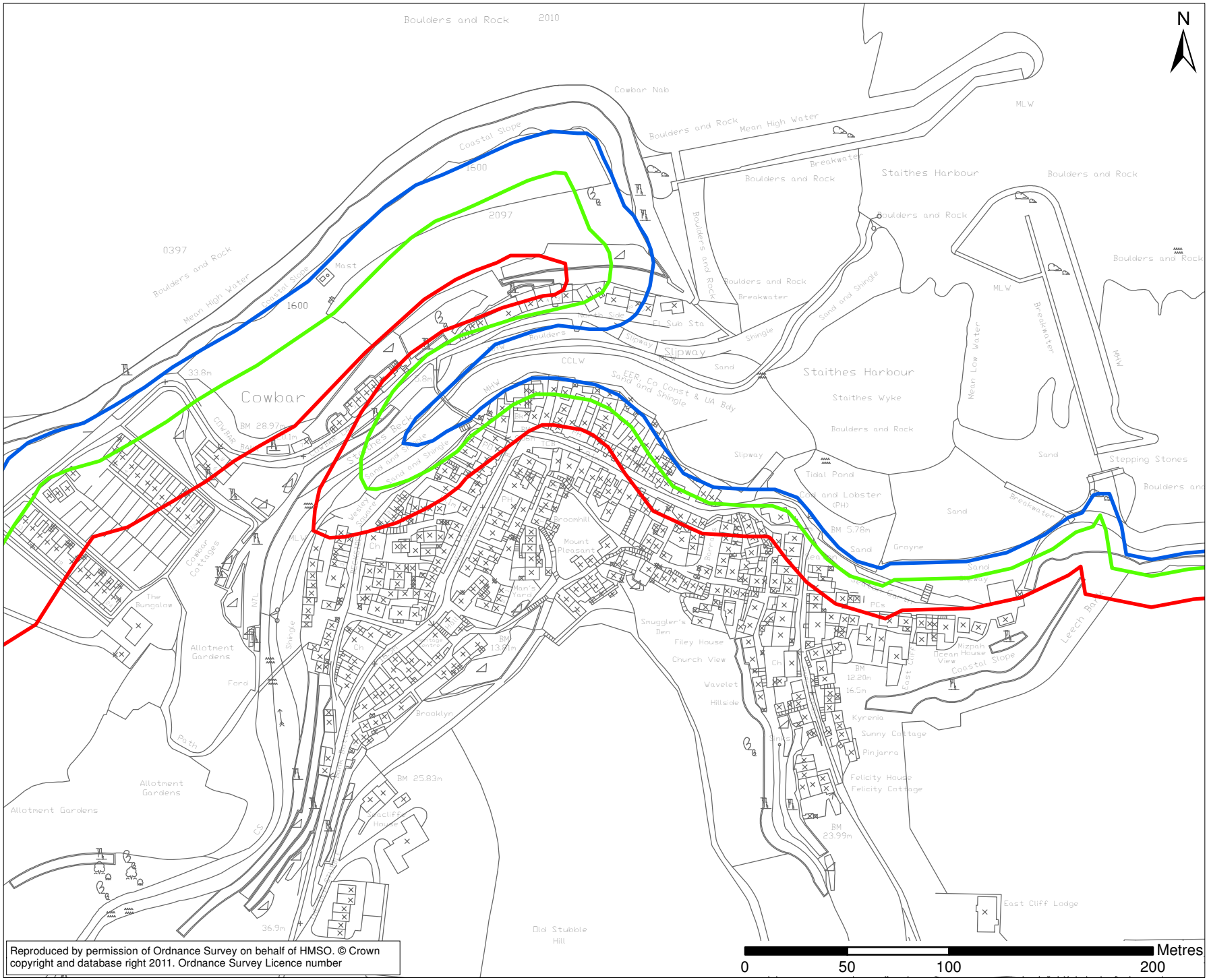


**SMP Erosion lines**

- Do Nothing - 20yrs
- Do Nothing - 50yrs
- Do Nothing - 100yrs

Title:
SMP Erosion Lines:
Staithes

Project:
Staithes

Client:
Scarborough Borough Council

| Date: | Scale at A?: |
|---|---|
| January 2012 | |

| Figure: | Drawn: | Checked: |
|---|---|---|
| 1 | TC | EH |

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**Figure 8.1 Flooding Limits**

**Figure 8.2 Erosion Limits**

# Appendix B

# Damage Spreadsheets

# Project Summary Sheet

| | | | | | |
|---|---|---|---|---|---|
| **Client/Authority** | | | | Prepared (date) | |
| Scarborough Borough Council | | | | Printed | 23/05/2012 |
| **Project name** | | | | Prepared by | EH |
| Staithes Harbour Wall Improvements | | | | Checked by | |
| **Project reference** | 9X1732 | | | Checked date | |
| Base date for estimates (year 0) | Mar-2012 | | | | |
| Scaling factor (e.g. £m, £k, £) | £k | (used for all costs, losses and benefits) | | | |
| Year | 0 | 30 | 75 | | |
| Discount Rate | 3.5% | 3.00% | 2.50% | | |
| Optimism bias adjustment factor | variable | | | | |

**Costs and benefits of options**

| | Costs and benefits £k | | | | |
|---|---|---|---|---|---|
| Option number | **Option 1** | **Option 2** | **Option 3** | **Option 4** | |
| Option name | Do Nothing | Do Minimum | Urgent Repair Works | Replace Wall | |
| AEP or SoP (where relevant) | | 40% OB | 20% OB | 60% OB | |
| **COSTS:** | | | | | |
| PV capital costs | 0 | 0 | 117 | 5,729 | |
| PV operation and maintenance costs | 0 | 35 | 34 | 80 | |
| PV other | 0 | 0 | 0 | 950 | |
| Optimism bias adjustment | 0 | 14 | 30 | 4,056 | |
| PV negative costs (e.g. sales) | 0 | 0 | 0 | 0 | |
| PV contributions | | | | | |
| **Total PV Costs £k excluding contributions** | 0 | 50 | 181 | 10,815 | |
| **Total PV Costs £k taking contributions into account** | 0 | 50 | 181 | 10,815 | |
| **BENEFITS:** | | | | | |
| PV monetised flood damages | 0 | 0 | 0 | 0 | |
| PV monetised flood damages avoided | | 0 | 0 | 0 | |
| PV monetised erosion damages | 3,208 | 3,208 | 0 | 0 | |
| PV monetised erosion damages avoided (protected) | | 0 | 3,208 | 3,208 | |
| **Total monetised PV damages £k** | 3,208 | 3,208 | 0 | 0 | |
| **Total monetised PV benefits £k** | | 0 | 3,208 | 3,208 | |
| PV damages (from scoring and weighting) | | | | | |
| PV damages avoided/benefits (from scoring and weighting) | | | | | |
| PV benefits from ecosystem services | | | | | |
| **Total PV damages £k** | 3,208 | 3,208 | 0 | 0 | |
| **Total PV benefits £k** | | 0 | 3,208 | 3,208 | |
| **DECISION-MAKING CRITERIA:** | | | | | |
| **excluding contributions** | | | | | |
| ***Based on total PV benefits (including benefits from scoring and weighting and ecosystem services)*** | | | | | |
| Net Present Value **NPV** | | -50 | 3,027 | -7,607 | |
| Average benefit/cost ratio **BCR** | | 0.0 | 17.7 | 0.3 | |
| Incremental benefit/cost ratio **IBCR** | | | 24.4 | 0.0 | |
| | | | Highest bcr IBCR>1 | | |
| ***Based on monetised PV benefits (excludes benefits from scoring and weighting and ecosystem services)*** | | | | | |
| Net Present Value **NPV** | | -50 | 3,027 | -7,607 | |
| Average benefit/cost ratio **BCR** | | 0.0 | 17.7 | 0.3 | |
| Incremental benefit/cost ratio **IBCR** | | | 24.4 | 0.0 | |
| | | | Highest bcr IBCR>1 | | |
| **including contributions** | | | | | |
| ***Taking account of contributions (including benefits from scoring and weighting and ecosystem services)*** | | | | | |
| Net Present Value **NPV** | | -50 | 3,027 | -7,607 | |
| Average benefit/cost ratio **BCR** | | 0.0 | 17.7 | 0.3 | |
| Incremental benefit/cost ratio **IBCR** | | | 24.4 | 0.0 | |
| | | | Highest bcr IBCR>1 | | |
| ***Based on monetised PV benefits (excludes benefits from scoring and weighting and ecosystem services)*** | | | | | |
| Net Present Value **NPV** | | -50 | 3,027 | -7,607 | |
| Average benefit/cost ratio **BCR** | | 0.0 | 17.7 | 0.3 | |
| Incremental benefit/cost ratio **IBCR** | | | 24.4 | - | |
| | | | Highest bcr IBCR>1 | | |
| Best practicable environmental option (WFD) | | | | | |

**Brief description of options:**

| | |
|---|---|
| Option 1 | Do Nothing |
| Option 2 | Do Minimum |
| Option 3 | Urgent Repair Works |
| Option 4 | Replace Wall |
| Option 5 | |

**Comments and assumptions:**

# Erosion Loss Calculation Sheet with delay options

Sheet Nr.

**Client/Authority**
Scarborough Borough Council

| **Project name** | | **Option:** | **Delay (yrs)** | Prepared (date) | 00/01/1900 |
|---|---|---|---|---|---|
| Staithes Harbour Wall Improvements | | Option 2 | 0 | Printed | 23/05/2012 |
| **Project reference** | 9X1732 | Option 3 | 40 | Prepared by | EH |
| **Base date for estimates (year 0)** | Mar-2012 | Option 4 | 50 | Checked by | 0 |
| **Scaling factor (e.g. £m, £k, £)** | £k | | 0 | Checked date | 0 |
| **Discount rate** | 3.5% | | | | |

| Ref | Asset Description | Risk free market value £k | Year when the asset is expected to be lost | Prob of loss in year | Expected value of asset losses £k | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Do Nothing | Do Minimum | Urgent Repair Works | Replace Wall | 0 |
| 0 | | | | | - | - | - | - | - |
| 1 | Residential properties - Yr 4-8 loss | 2980.34 | 4 | 0.2 | 519.44 | 519.44 | - | - | |
| 2 | | 2980.34 | 5 | 0.2 | 501.87 | 501.87 | - | - | |
| 3 | | 2980.34 | 6 | 0.2 | 484.90 | 484.90 | - | - | |
| 4 | | 2980.34 | 7 | 0.2 | 468.50 | 468.50 | - | - | |
| 5 | | 2980.34 | 8 | 0.2 | 452.66 | 452.66 | - | - | |
| 6 | | | | | - | - | - | - | |
| 7 | Commercial properties - Yr 4-8 loss | 0.00 | 4 | 0.2 | - | - | - | - | |
| 8 | | 0.00 | 5 | 0.2 | - | - | - | - | |
| 9 | | 0.00 | 6 | 0.2 | - | - | - | - | |
| 10 | | 0.00 | 7 | 0.2 | - | - | - | - | |
| 11 | | 0.00 | 8 | 0.2 | - | - | - | - | |
| 12 | | | | | - | - | - | - | |
| 13 | Residential properties - Yr 40 loss | 2675.00 | 39 | 1 | 730.43 | 730.43 | - | - | |
| 14 | | | | | - | - | - | - | |
| 15 | Commercial properties - Yr 40 loss | 183.30 | 39 | 1 | 50.05 | 50.05 | - | - | |
| 16 | | | | | - | - | - | - | |
| 17 | | | | | - | - | - | - | |
| 18 | | | | | - | - | - | - | |
| 19 | | | | | - | - | - | - | |
| 20 | | | | | - | - | - | - | |
| 21 | | | | | - | - | - | - | |
| 22 | | | | | - | - | - | - | |
| 23 | | | | | - | - | - | - | |
| 24 | | | | | - | - | - | - | |
| 25 | | | | | - | - | - | - | |
| 26 | | | | | - | - | - | - | |
| 27 | | | | | - | - | - | - | |
| 28 | | | | | - | - | - | - | |
| 29 | | | | | - | - | - | - | |
| 30 | | | | | - | - | - | - | |
| 31 | | | | | - | - | - | - | |
| 32 | | | | | - | - | - | - | |
| 33 | | | | | - | - | - | - | |
| 34 | | | | | - | - | - | - | |
| 35 | | | | | - | - | - | - | |
| 36 | | | | | - | - | - | - | |
| 37 | | | | | - | - | - | - | |
| 38 | | | | | - | - | - | - | |
| 39 | | | | | - | - | - | - | |
| 40 | | | | | - | - | - | - | |
| 41 | | | | | - | - | - | - | |
| 42 | | | | | - | - | - | - | |
| 43 | | | | | - | - | - | - | |
| 44 | | | | | - | - | - | - | |
| 45 | | | | | - | - | - | - | |
| 46 | | | | | - | - | - | - | |
| 47 | | | | | - | - | - | - | |
| 48 | | | | | - | - | - | - | |
| 49 | | | | | - | - | - | - | |
| 50 | | | | | - | - | - | - | |
| **Totals** | | 5838.64 | | | 3207.86 | 3207.86 | 0.00 | 0.00 | |

**Notes**
**Make one entry in the description column for each property (or group of properties) as this determines subsequent calculation**
**MV = risk free market value at base date for estimate - must be entered on each line when probaility distribution is used**
**Equivalent annual value = MV x discount rate (assumes infinite life)**
**Year is year in which there is the probability of loss shown, years must be entered consecutively for each property or group**
**If no distribution is used enter year of expected year of loss and enter 1.0 in probability column**
**Columns G to K show expected values of asset losses with each option, assuming extensions of life entered above**
**The loss is calculated using the formula PV loss = MV * Prob of loss * (1 - (1 - 1/((1+r)^(Year of loss))) = MV * Prob of loss / ((1+r)^(Year of loss))**
**Additional properties can be entered by inserting lines above line 62 and copying all formulae, including hidden calculation in column C**

| | GISid | floorarea | floorlevel | housetype | mcmcode | os_class | Res Value | Bulk Class | Comm Value | Res Count | Comm Count |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Properties at risk Years 4-8 (outside of Harbour Improvements Phase 3 Benefit Area) | 1 | 30 | dG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 2 | 30 | dG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 3 | 34 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 6 | 0 | pU | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 7 | 26 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 9 | 61 | pG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 11 | 33 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 41 | 31 | pG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 42 | 25 | pG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 60 | 18 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 61 | 0 | pU | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 62 | 35 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 65 | 30 | dG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 66 | 69 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 67 | 18 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 69 | 30 | dG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 70 | 25 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 71 | 14 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 72 | 30 | dG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 73 | 30 | dG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 94 | 13 | dG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 96 | 13 | dG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 98 | 46 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 102 | 30 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | **Total** | | | | | | **£2,980,340** | | **£0** | **24** | **0** |
| Properties at risk Year 40 (outside of Harbour Improvements Phase 3 Benefit Area) | 4 | 24 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 10 | 45 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 12 | 46 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 28 | 77 | pG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 38 | 28 | pG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 39 | 63 | pG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 43 | 25 | pG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 44 | 40 | pG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 57 | 149 | dG | | 511 | INN | £0 | retail | £140,060 | 0 | 1 |
| | 58 | 76 | dG | Det | 1 | DWELLING | £264,608 | Residential | £0 | 1 | 0 |
| | 59 | 24 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 63 | 43 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 64 | 42 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 84 | 33 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 89 | 41 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 90 | 24 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 95 | 73 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 97 | 43 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 99 | 24 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 100 | 25 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 101 | 46 | dG | | 236 | CAF ├ë | £0 | Retail | £43,240 | 0 | 1 |
| | 103 | 21 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | | 133 | dG | | 630 | CLUB HOUSE | £0 | Non-bulk | £31,920 | 0 | 1 |
| | | 0 | dG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | **Total** | | | | | | **£2,675,005** | | **£183,300** | **20** | **2** |
| Properties at risk Years 4-8 (included in Harbour Improvements Phase 3 Benefit Area) | 47 | 54 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 51 | 10 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 56 | 39 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 86 | 0 | pU | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | **Total** | | | | | | **£501,600** | | **£0** | **4** | **0** |
| Properties at risk Year 40 (included in Harbour Improvements Phase 3 Benefit Area) | 14 | 0 | pU | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 16 | 83 | dG | | 511 | INN | £0 | retail | £78,020 | 0 | 1 |
| | 17 | 32 | pG | Flat | 1 | DWELLING | £121,011 | Residential | £0 | 1 | 0 |
| | 27 | 43 | pG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 33 | 66 | pG | Det | 1 | DWELLING | £264,608 | Residential | £0 | 1 | 0 |
| | 35 | 51 | pG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 45 | 39 | dG | SDet | 1 | DWELLING | £150,340 | Residential | £0 | 1 | 0 |
| | 46 | 42 | dG | SDet | 1 | DWELLING | £150,340 | Residential | £0 | 1 | 0 |
| | 54 | 55 | dG | Det | 1 | DWELLING | £264,608 | Residential | £0 | 1 | 0 |
| | 85 | 24 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | 88 | 40 | dG | Terr | 1 | DWELLING | £126,863 | Residential | £0 | 1 | 0 |
| | **Total** | | | | | | **£1,579,370** | | **£78,020** | **10** | **1** |

# Present Value Costs for all options

Sheet Nr. 10

**Client/Authority**
Scarborough Borough Council

**Project name**
Staithes Harbour Wall Improvements

**Project reference** 9X1732
Base date for estimates (year 0) Mar-2012
Scaling factor (e.g. £m, £k, £) £k
Initial discount rate 3.5%

Prepared (date) 00/01/1900
Printed 23/05/2012
Prepared by EH
Checked by 0
Checked date 0

**Results £k**

| | Option 1 Do Nothing | Option 2 Do Minimum | Option 3 Urgent Repair Works | Option 4 Replace Wall | Option 5 0 |
|---|---|---|---|---|---|
| PV total costs | 0 | 35 | 151 | 6,759 | 0 |

| | Option 1 | Do Nothing | | | TOTALS: PV | PV | PV | PV | PV | Option 2 | Do Minimum | | | TOTALS: PV | PV | PV | PV | PV | Option 3 | Urgent Repair Works | | | TOTALS: PV | PV | PV | PV | PV | Option 4 | Replace Wall | | | TOTALS: PV | PV | PV | PV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Capital | Maint. | Other | Negative costs | Cash | Capital | Maint | Other | Negative costs | Capital | Maint. | Other | Negative costs | Cash | Capital | Maint | Other | Negative costs | Capital | Maint. | Other | Negative costs | Cash | Capital | Maint | Other | Negative costs | Capital | Maint. | Other | Negative costs | Cash | Capital | Maint | Other |
| cash sum | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0 | 64 | 0 | 0 | 64.00 | 0.00 | 35.47 | 0.00 | 0.00 | 117 | 62.4 | 0 | 0 | 179.40 | 117.00 | 33.87 | 0.00 | 0.00 | 6243 | 159.6 | 983 | 0 | 7385.60 | 5729.37 | 80.30 | 949.76 |
| year | Discount Factor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1.000 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.60 | 0.00 | 0.00 | 117 | | | | 117.00 | 117.00 | 0.00 | 0.00 | 0.00 | | | | | 0.00 | 0.00 | 0.00 | 0.00 |
| 1 | 0.966 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.55 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.55 | 0.00 | 0.00 | | | 983 | | 983.00 | 0.00 | 0.00 | 949.76 |
| 2 | 0.934 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.49 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.49 | 0.00 | 0.00 | 3121.5 | | | | 3121.50 | 2913.95 | 0.00 | 0.00 |
| 3 | 0.902 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.44 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.44 | 0.00 | 0.00 | 3121.5 | | | | 3121.50 | 2815.41 | 0.00 | 0.00 |
| 4 | 0.871 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.39 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.39 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 3.14 | 0.00 |
| 5 | 0.842 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.35 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.35 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 3.03 | 0.00 |
| 6 | 0.814 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.30 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.30 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.93 | 0.00 |
| 7 | 0.786 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.26 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.26 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.83 | 0.00 |
| 8 | 0.759 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.22 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.22 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.73 | 0.00 |
| 9 | 0.734 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.17 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.17 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.64 | 0.00 |
| 10 | 0.709 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.13 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.13 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.55 | 0.00 |
| 11 | 0.685 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.10 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.10 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.47 | 0.00 |
| 12 | 0.662 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.06 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.06 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.38 | 0.00 |
| 13 | 0.639 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.02 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 1.02 | 0.00 | 0.00 | | 13.6 | | | 13.60 | 0.00 | 8.70 | 0.00 |
| 14 | 0.618 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.99 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.99 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.22 | 0.00 |
| 15 | 0.597 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.96 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.96 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.15 | 0.00 |
| 16 | 0.577 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.92 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.92 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.08 | 0.00 |
| 17 | 0.557 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.89 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.89 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 2.01 | 0.00 |
| 18 | 0.538 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.86 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.86 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.94 | 0.00 |
| 19 | 0.520 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.83 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.83 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.87 | 0.00 |
| 20 | 0.503 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.80 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.80 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.81 | 0.00 |
| 21 | 0.486 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.78 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.78 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.75 | 0.00 |
| 22 | 0.469 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.75 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.75 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.69 | 0.00 |
| 23 | 0.453 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.73 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.73 | 0.00 | 0.00 | | 13.6 | | | 13.60 | 0.00 | 6.16 | 0.00 |
| 24 | 0.438 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.70 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.70 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.58 | 0.00 |
| 25 | 0.423 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.68 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.68 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.52 | 0.00 |
| 26 | 0.409 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.65 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.65 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.47 | 0.00 |
| 27 | 0.395 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.63 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.63 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.42 | 0.00 |
| 28 | 0.382 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.61 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.61 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.37 | 0.00 |
| 29 | 0.369 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.59 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.59 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.33 | 0.00 |
| 30 | 0.356 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.57 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.57 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.28 | 0.00 |
| 31 | 0.346 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.55 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.55 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.25 | 0.00 |
| 32 | 0.336 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.54 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.54 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.21 | 0.00 |
| 33 | 0.326 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.52 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.52 | 0.00 | 0.00 | | 13.6 | | | 13.60 | 0.00 | 4.43 | 0.00 |
| 34 | 0.317 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.51 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.51 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.14 | 0.00 |
| 35 | 0.307 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.49 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.49 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.11 | 0.00 |
| 36 | 0.298 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.48 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.48 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.07 | 0.00 |
| 37 | 0.290 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.46 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.46 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.04 | 0.00 |
| 38 | 0.281 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.45 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.45 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 1.01 | 0.00 |
| 39 | 0.273 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.44 | 0.00 | 0.00 | | 1.6 | | | 1.60 | 0.00 | 0.44 | 0.00 | 0.00 | | 3.6 | | | 3.60 | 0.00 | 0.98 | 0.00 |

# Appendix C

# FDGiA Calculator

# PARTNERSHIP FUNDING CALCUATOR

for the 2013/14 Flood and Coastal Risk Management Medium Term Plan

ePublications Catalogue Code -

**Project Name** Staithes North Bay Urgent Harbour Wall repairs
**Unique Project Reference**

**ALL COSTS ARE IN THOUSANDS OF POUNDS (£k)**

Key: Input cells / Calculated cells

**SUMMARY: prospect of FDGiA funding**

| | | | |
|---|---|---|---|
| **PV Maximum FDGiA that the scheme can attract = 'FDGiA Contribution'** | **140** | | |
| **Raw Score** | **461.80%** | **Scheme Benefit to Cost Ratio** | **17.72** to 1 |
| **Partnership Funding Score (PF)** | **484.46%** | Effective return to taxpayer | 22.91 to 1 |
| | | Effective return to area | 78.24 to 1 |

**1. Scheme details**

| | | |
|---|---|---|
| **Risk Management Authority type of asset maintainer** | **LA** | Y — Is evidence available that a Strategic Approach has been taken, and that double counting of Benefits has been avoided ? |
| **Duration of Benefits (yrs)** | **40** | |
| PV Appraisal Costs | | **All Costs and Contributions must be on a PV Whole-Life basis over the Duration of Benefits; and include Contributions towards future Maintenance** |
| PV Design & Construction Costs | 140 | |
| PV Post Construction Costs | 41 | |
| **PV Total Costs** | **181** | |
| PV Local Levy secured to date | | **Figures in Blue to be entered onto MTP** |
| PV Public Contributions secured to date | 41 | |
| PV Private Contributions secured to date | | |
| PV Funding from Other Environment Agency Functions/Sources secured to date | | |
| **PV Total Contributions secured to date** | 41 | |
| **PV Total Benefits** | **3,208** | |

**2. Qualifying benefits under Outcome Measure 2: houses better protected against flood risk**

| Number of houses in: | Before | | | After | | | Change due to scheme | | |
|---|---|---|---|---|---|---|---|---|---|
| 20% most deprived areas | | | | | | | 0 | 0 | 0 |
| 21-40% most deprived areas | | | | | | | 0 | 0 | 0 |
| 60% least deprived areas | | | | | | | 0 | 0 | 0 |
| *At:* | Moderate risk | Significant risk | Very significant risk | Moderate risk | Significant risk | Very significant risk | Moderate risk | Significant risk | Very significant risk |
| Annual damages avoided, compared with a house at low risk | | | | | | | 0.150 | 0.600 | 1.350 |

| Change in house damages, in: | Per year | Over lifetime of scheme | **Qual. benefits (discounted)** |
|---|---|---|---|
| 20% most deprived areas | 0.0 | 0 | **OM2 (20%) 0** |
| 21-40% most deprived areas | 0.0 | 0 | **OM2 (21-40%) 0** |
| 60% least deprived areas | 0.0 | 0 | **OM2 (60%) 0** |

**3. Qualifying benefits under Outcome Measure 3: houses better protected against coastal erosion**

| Number of houses in: | Before | | Damages per house avoided: | | | |
|---|---|---|---|---|---|---|
| 20% most deprived areas | | | Annual damages avoided (£k) | 6.0 | 6.0 | |
| 21-40% most deprived areas | 30 | 28 | Loss expected in | 50 | 20 | years |
| 60% least deprived areas | | | Present value of Year 1 loss (i.e. first year damages, discounted based on when loss is expected) (£k) | 1.2 | 3.0 | |
| | Long-term loss | Medium-term loss | | Long-term loss | Medium-term loss | |

| Change in house damages, in: | Year 1 loss avoided | Over lifetime of scheme | **Qual. benefits (discounted)** |
|---|---|---|---|
| 20% most deprived areas | 0.0 | 0 | **OM3 (20%) 0** |
| 21-40% most deprived areas | -119.9 | -4,798 | **OM3 (21-40%) 2,690** |
| 60% least deprived areas | 0.0 | 0 | **OM3 (60%) 0** |

**4. Qualifying benefits under Outcome Measure 4: statutory environmental obligations met**

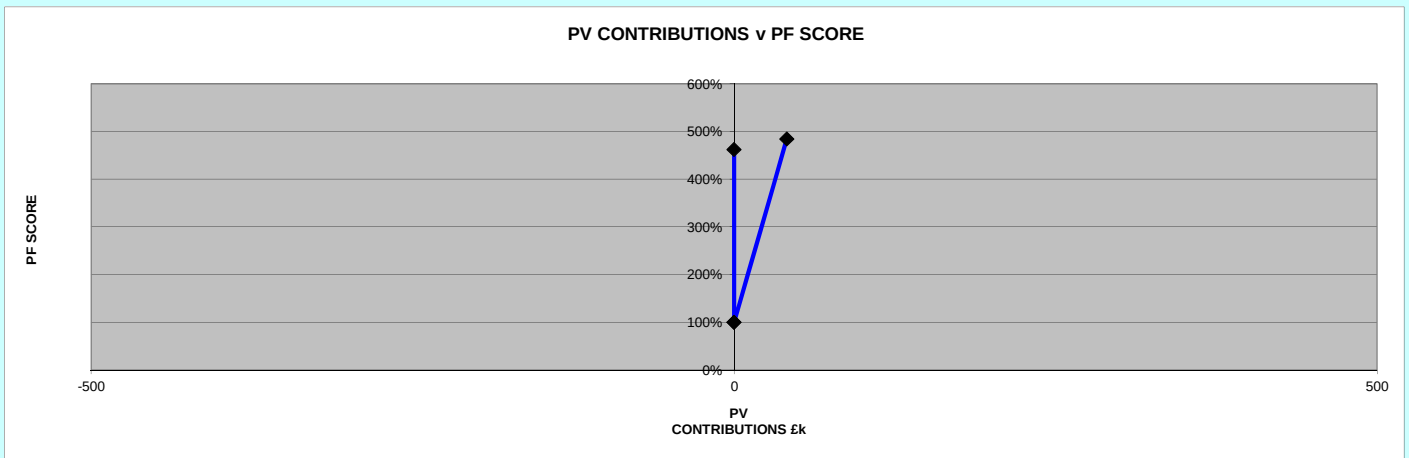
| Payments under: | | | Assumed benefits per unit | **Qualifying benefits** |
|---|---|---|---|---|
| OM4a | | Hectares of net water-dependent habitat created | 15.0 | OM4a 0 |
| OM4b | | Hectares of net intertidal habitat created | 50.0 | OM4b 0 |
| OM4c | | Kilometres of protected river improved | 80.0 | OM4c 0 |
| | | | | **OM4 0** |

**5. Qualifying benefits arising from the overall scheme, for entry into the Medium-Term Plan**

| OM, deprivation: | | Qual. Benefits | Payment rate (p/£) | |
|---|---|---|---|---|
| OM1 | | 518 | 5.56 | 29 |
| OM2 | 20% most | 0 | 45.0 | 0 |
| | 21-40% | 0 | 30.0 | 0 |
| | Least 60% | 0 | 20.0 | 0 |
| OM3 | 20% most | 0 | 45.0 | 0 |
| | 21-40% | 2,690 | 30.0 | 807 |
| | Least 60% | 0 | 20.0 | 0 |
| OM4 | | 0 | 100.0 | 0 |
| | Total | **3,208** **PVB** | | **836** **PV Maximum FDGiA that the scheme could qualify for** |

**PV CONTRIBUTIONS v PARTNERSHIP FUNDING SCORE**

| | Raw Score | Current PF% if < 100% | PF 100% | Current PF% if > 100% | PV Contribution Scenarios | | |
|---|---|---|---|---|---|---|---|
| **PV Contributions** | 0 | | 0 | 41 | | | |
| **Partnership Funding Score** | 461.80% | | 100.00% | 484.46% | 461.80% | 461.80% | 461.80% |
| PV Contributions yet to be secured to achieve PF Score | | | -41 | 0 | -41 | -41 | -41 |




***Sensitivity Testing*** *. It is important that users of this calculator appreciate the implications on funding from changes to input data which may become necessary as the project develops and better information is available. Three typical tests are provided below. Users should consider how appropriate these are to their project, what other tests may be appropriate and how best to use the information with all those that may be involved in the project.*

| | PV FDGiA Contribution | Raw Score | PF Score |
|---|---|---|---|
| As above | 140 | 461.80% | 484.46% |
| Sensitivity 1 - Change in PV Whole Life Cost (25% increase) | 185 | 369.44% | 387.56% |
| Sensitivity 2 - Change in OM2 - 50% of households in Very Significant (Before) risk may already be in Significant Risk band | 140 | 461.80% | 484.46% |
| Sensitivity 3 - Change in OM3 - 50% of households in Medium Term loss (Before) may already be in Long Term loss | 140 | 384.11% | 406.77% |
| Sensitivity 4 - Increase Duration of Benefits by 25% | 140 | 498.43% | 521.09% |
| Sensitivity 5 - Reduce Duration of Benefits by 25% | 140 | 412.58% | 435.23% |