

<b>Key Decision Required:</b>	<b>Yes</b>	<b>In the Forward Plan:</b>	<b>Yes</b>
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## CABINET

17 MAY 2013

### REPORT OF ENVIRONMENT AND COAST PROTECTION PORTFOLIO HOLDER

#### **A.10 CLACTON AND HOLLAND COASTAL DEFENCE WORK**

(Report prepared by June Clare and Mike Badger)

#### **PART 1 – KEY INFORMATION**

##### **PURPOSE OF THE REPORT**

To report the progress to date on the preparation of the Project Appraisal Report (PAR) for the frontage of Clacton and Holland-on-Sea and to enable Cabinet to agree to the preferred option for the fishtail rock groyne structures and beach recharge.

##### **EXECUTIVE SUMMARY**

- Following the decisions made by Cabinet at their meeting on 14 March 2012 Mott MacDonald appointed to prepare the Project Appraisal Report (PAR) for the Clacton and Holland frontage.
- PAR to be submitted to the Environment Agency 17 May 2013 in order that it can be presented to their Large Project Review Group (LPRG) on 10th and 11<sup>th</sup> July 2013.
- To provide confidence with the options identified and to reduce the project risk topographical, geotechnical surveys and computer modelling of the coastal processes commissioned to identify most appropriate technical/cost effective solutions
- £512,000 funding for growth through flood alleviation awarded to the Clacton and Holland Coastal Defences included in the programme of acceleration and growth with target of starting construction works in early 2015. Officers working closely with Environment Agency to ensure the project continues to move forward with pace.
- Following public consultation and recent surveys 3 of the original 5 options now under consideration as listed below together with approval costs being sought from the Environment Agency as detailed in the PAR.

**Option2**      £37m - Straight Rock groynes with sand beach recharge at Clacton and sand and shingle mix beach recharge at Holland

**Option3**      £30m - Fishtail rock groynes with sand and shingle mix beach recharge for the whole frontage

**Option4**      £36m - Fishtail rock groynes with sand recharge at Clacton and straight rock groynes with mixed sand/shingle recharge at Holland

- PAR process identified best technical and economic option as Option 3. Cabinet are asked to agree this preferred option to allow the PAR to be delivered in the current available timescale.
- If Cabinet believes that a different and more expensive Option than Option 3 is preferred, then additional funding would need to be provided and this is not likely to be granted through the Environment Agency funding model.

## RECOMMENDATION(S)

- (a) That Cabinet notes the progress to date and agrees preferred option – Option 3 which includes a sand/shingle mix beach recharge as detailed in Part 3 of the report under paragraph headed Preferred Option Selection**
- (b) That £512,000 funded by Government Grant by added to the budget and earmarked towards delivery of the Clacton and Holland coastal defence work.**

## PART 2 – IMPLICATIONS OF THE DECISION

### DELIVERING PRIORITIES

The Council's Corporate Plan, Tendring Life, recognises that Tendring's 36 miles of coastline and award winning sandy beaches are both our greatest assets as well as our most difficult and expensive management issues. Both the priorities 'Our Place' and 'Our Prosperity' are impacted by coastal defence issues, in that they relate to the development of a thriving tourist industry and of course protecting our environment.

### FINANCE, OTHER RESOURCES AND RISK

#### Finance and other resources

At its meeting on 7 February 2012 the Council established a fund of £3 million for coastal defence and enhancement work and to be able to take advantage of any regeneration/activities that may arise.

Essex County Council has included £3million in its capital programme towards this project.

The cost of engaging the consultant for the PAR work was funded from a contribution from the Environment Agency along with funding from the Council's own coast protection special maintenance budget.

A bid to Government for £512,000 for the Clacton and Holland Coastal Defences was successful and approved in February 2013 and this Council's project is included in the programme of Acceleration and Growth with a target of starting construction works in early 2015.

As part of the whole life cost of the project, it will be necessary to recognise the cost of 'recharging' the beach in the future to maintain the level of protection of the coast which is a normal requirement of this type of coast defence project.

Although the timing of such 'recharges' will be subject to the performance of the scheme, at present it is anticipated that a 10% 'recharge' would be required approximately every ten years, which is reflected in the PAR document. Based on this approach, such a 'recharge' is estimated to cost approximately **£1.4m**. On-going monitoring of the schemes performance would be carried out with regular beach level surveys undertaken.

It may be possible that the Environment Agency would consider further financial support in contributing to the cost of 'recharging' the beach in the future. However at the present time a practical option would be for the Council to set aside the necessary funding over an initial 10 year period, which will need to be considered as part of the Financial Strategy and budget setting processes in the intervening years. This will also enable the opportunity to take into account the outcomes from the on-going monitoring work, working with the Environment Agency to identify further funding opportunities in addition to identifying new income streams from maximising the benefits that a project of this scale will bring to the seafront and local economy. Existing income from seafront assets should also be reviewed as these will increase in value as a result of the works and this income could be ring fenced to offset the current and future capital contributions.

**Risk:** Coastal defence failure is included in the Council's Risk Register.

"There is a risk that, as a coastal authority and in relation to climate change issues, that reduced provision or maintenance of or a collapse of sea defences could have a severe environmental impact and cause damage to local property and infrastructure."

The Register highlights the following specific issues in the event of sea defence failure:

- Preventative / reactive improvements are not undertaken
- Problems stored for later years
- Breach of defences with subsequent flooding
- Threat to property and possibly life
- Complaints from public / litigation
- Adverse publicity
- Local economy adversely affected

## **LEGAL**

The Council has permissive powers to carry out these works under the provisions of the Coast Protection Act 1949. The Council has a duty to exercise its powers reasonably having regard to all the relevant circumstances.

## **OTHER IMPLICATIONS**

Consideration has been given to the implications of the proposed decision in respect of the following and any significant issues are set out below.

**Crime and Disorder** – No direct implications

**Equality and Diversity** – No direct implications

**Health Inequalities** – No direct implications

**Area or Ward affected** – St. James, Pier, St. Paul's, St. Bartholomews and Haven

**Consultation/Public Engagement** – Public consultation and engagement has been undertaken for the Essex & South Suffolk Shoreline Management Plan, the Clacton & Holland Coastal Management Plan and the Clacton and Holland on Sea Coast Defence Project Appraisal Report.

## PART 3 – SUPPORTING INFORMATION

### BACKGROUND

The report to Cabinet 14 March 2012 detailed the very serious coastal erosion problems on the sea front at Clacton & Holland-on-Sea and provided a summary of the work previously carried out as well as the work required to address these problems.

Due to the lack of DEFRA funding in 2005, following the first Clacton & Holland Coastal Strategy, Tendring District Council commissioned a review with the intention to produce a revised programme of coastal protection works.

This report follows the second Essex Shoreline Management Plan and develops its recommendations to 'hold the line' whilst identifying outline technical solutions.

The Government funding arrangements for coastal protection works altered in April 2012 such that only a proportion of any costs will be met centrally by government leaving the Coastal Authorities to source the remainder.

The new Clacton & Holland Coastal Coast Management Plan (Clacton Coastal Strategy), recommends a series of works along the whole frontage from the Martello Inn (Zone A) to Holland Haven (Zone C) with a programme spread over fifty years and a cost of up to £50 million.

However much of this work and expenditure is in the latter stages of the programme and a realistic view suggests that, within the next ten to fifteen years, only Holland-on-Sea and part of the Clacton frontage to the East of the Pier require works urgently at a cost of approximately £25m. The Council's proposals for coastal protection work include a commitment to reinstating the beach at Holland-on-Sea.

As part of the PAR the following actions have been completed:-

a) A revision to the extent of the urgent works required over the next 5 years to cover the entire frontage from the Pier to Holland Haven (Zones B and C) – and not just part of this frontage. This decision is supported by condition survey information and the Environment Agency.

b) Condition Survey.

c) Environmental Baseline Review and submitted to the various statutory consultees and a letter of support has recently been received from Natural England.

d) Option Evaluation and review of existing data and identification of the problem and physical processes.

e) Technical appraisal and option development based on a beach recharge with a series of erosion control rock structures.

f) Risk Workshop held and risks identified together with processes to minimise them.

g) Public consultation.

h) An officer Seafront Project Team has also been established comprising representatives from planning, assets, engineering and coastal, seafronts, inward investment and Essex County Council in order to ensure that the coastal defence project is driven through and to

examine the opportunities for the Council in terms of tourism, investment and regeneration.

It is important to keep in mind the possibility that catastrophic cliff and promenade failure could occur within this period which would require emergency works and immediate funding.

This report provides information on the progress being made in order to protect the coastal frontage of Clacton and Holland-on-Sea and the residential and tourism infrastructure that is supported by it. The three million pounds committed at the Council meeting on 7th February 2012 for coastal protection and enhancements is the foundation stone for this project and has attracted match funding by Essex County Council for the necessary work.

## CURRENT POSITION

Mott MacDonald has developed different options for the area comprising the Zone B - Clacton Pier to Eastcliff and Zone C - Eastcliff to Holland Haven which are considered to be the areas at greatest risk.

The following options have been identified:-

1. The do nothing scenario.
2. Beach recharge with straight rock groynes.
3. Beach recharge with fishtail rock groynes.
4. Beach recharge with a combination of both fish tail and straight rock groynes.
5. Beach recharge with and a combination of rock groynes and rock revetment.

These are shown in Appendix 1.

An economic appraisal of the various options is being developed as follows:-

Objective	Description
Objective 1 – Technical	To adopt a realistic solution to protect the frontage from coastal erosion and flooding over the next 100 years, taking into consideration uncertainties associated with sea level rise and climate change scenarios. Additional options to the Strategy are to be considered, alongside gaining a greater understanding of the design and effectiveness of the Strategy preferred option.
Objective 2 - Economic	The scheme will aim to give the best level of protection that is economically viable for the optimum value achievable. The benefit to cost ratio based on whole life costing over the 100 years of the chosen scheme should be the highest practicable.
Objective 3 – Social and Amenities	The restoration in value of the beach and frontage at Clacton and Holland-on-Sea to the economy and status of the town is a major objective of the proposed scheme. The developed scheme will work with other proposals to regenerate Clacton (such as Celebrate-on-Sea). Without a scheme 3,019 properties will be at Coastal Erosion risk over the next 100 years (estimated erosion lines are provided in Appendix 1).
Objective 4 - Environmental	Any engineered defence that may be proposed will aim to have the minimum impact possible and where practicable enhance the coastal system and the environment of the area. Potential impacts on the maritime cliffs will be carefully considered.
Objective 5 – Strategic	The proposed scheme implemented at this site will take account of the adjacent coastline and will aim to have a net negligible effect or beneficial effect if practicable on the coastal dynamics.
Objective 6 - Safety	The proposed scheme should be safe for those that use it, providing safe access to the beach and maintain a safe access along the promenade / full frontage

length. The proposed scheme should be designed and constructed safely. Stringent safety standards will be implemented during the development of any scheme so that those working on the project will be exposed to minimum danger.

### Options taken forward

Options deemed appropriate by Tendring District Council and the Mott MacDonald Project Team were carried forward to the short-listed options. The Do Nothing option is not considered viable but has been included as it will provide an economic baseline against which the other options can be compared.

### Option 1 Do Nothing

The Do Nothing scenario has been included as a baseline only. It is not considered a viable option as it will expose 3,019 properties to risk of erosion over the next 100 years.

Year	Residential properties	Commercial properties
0 – 20	371	13
21 – 50	1054	36
51 - 100	1417	128

The construction options under consideration are as follows and the approval costs stated include a risk contingency. They also take into account the revised clay levels established during the recent ground investigation works. This identified the clay platform to be higher than considered previously and therefore some design optimisation has produced a net benefit in reducing costs associated with each type of rock structure.

It has also identified that the greatest risk to the cost of the works is associated with the volume and unit price of the beach recharge. Due to the distance of the frontage (over 5 kilometres) small variations in levels of recharge, existing levels at the time of recharge or the price per cubic metre of recharge delivered under the contract works has a significant impact on the outturn cost:-

### Option 2 Straight Rock Groynes and Beach Recharge EA Approval cost £37m :-

59 straight rock groynes to help trap the beach material from transport by longshore drift. 14 rock groynes, for Section B1 and 45 rock groynes for Sections B2, C1 and C2. Beach nourishment (sand nourishment in Section B1 and shingle nourishment in Sections B2, C1 and C2 to match current environment) will increase beach levels providing an increased amenity for tourism as well as increasing protection to the sea wall and promenade against erosion. Rock groynes have the advantage of being more sustainable in the long term and therefore are a less expensive option compared to timber groynes over the 100 years

### Option 3 Fishtail Rock Groynes and Beach Recharge EA Approval cost £30m :-

25 fishtail rock groynes, spaced at a 1:2 ratio (length:space) will help trap the beach material from transport by longshore drift. Beach nourishment sand and shingle mix to match current environment will increase beach levels providing an increased amenity for tourism as well as increasing protection to the sea wall and promenade against erosion. The advantage of fishtail groynes is the long arms are designed to directly intersect incoming waves and tides. This increases deposition of material due to wave refraction as well as acting as a barrier to longshore drift.

### Option 4 Fishtail Rock Groynes, Straight Rock Groynes and Beach Recharge EA Approval cost £36 m:-

Combines option 2 and 3 by considering what is most suitable for either sand or shingle beaches. As fishtail rock groynes have the advantage of increasing deposition through wave refraction and intercepting multiple wave directions, they could be beneficial for holding beach material. However, as they are larger structures and most examples of them around the UK coast is on shallow sand beaches, the effectiveness of them on a steep shingle beach is more uncertain. Therefore combining the two groyne types allows specific adaptation for the beach type.

#### **Option 5 Straight and Fishtail Rock Groynes, Rock Revetment, and Beach Recharge EA Approval cost £33m:-**

Combines options 2 and 3 and a rock revetment. A rock revetment protects and supports the sea wall behind by using large rock boulders to reduce the energy of the approaching waves and therefore reduces the erosion. The advantage of a rock revetment along this section is that it provides an opportunity to widen the promenade to create areas for regeneration initiatives. However, this would limit any area for a beach even at low tide and it is likely over time no beach would be present in this area

#### **Consultation**

The PAR process was taken to public consultation in January and February and 291 responses were received from the public and analysed as follows:-

238 people fully support the proposals that have been put forward.

Option 3 (fishtails) was given the most fully supported response with 157 people.

Option 5 was the least preferred option with 88 people indicating that they did not want this.

Other options varied.

There were a high number of people who did not provide responses for all options provided.

The use of coarser sand at Holland was not well received with 113 people not supporting (rated 1). However it is key here to mention that a high number of people thought the beach recharge material was going to entirely comprise stones and not the proposed sand/stone mixed material.

A table of the consultation response is shown in Appendix 2

#### **On going works**

To assist and inform the current option work being developed at the time of drafting this report, topographical and geotechnical surveys of the coast defence frontage at strategic locations are being undertaken to provide greater confidence in the technical performance of the options and the projected costs and to assist the next stages of the project through the preliminary and detailed design process.

The completed PAR will be submitted to the Environment Agency by 17 May in order that it will be considered by the July meeting of their Large Project Review Group (LPRG)

#### **Preferred Option Selection**

The Project Team and Mott MacDonald have undertaken a further review of the various

options on technical and economic grounds and believe that the best all round solution is to utilise fish tail rock groyne structures with a sand / shingle mix beach recharge material along the whole frontage.

As part of the ongoing preliminary design process the proposed beach re-charge material is being carefully selected to meet best overall performance, suitability and value criteria. The current proposals are to utilise a re-charge material along the frontage that reflects the current nature of the beaches at Clacton. Sediment sampling and associated results are now available that demonstrate that the recharge material should comprise between 30% to 50% fine to coarse sand (ie material <2mm in diameter) and 50% to 70% fine to medium gravel (ie material from 2mm up to 20mm maximum size) – some top end coarse gravel from 20mm to 60mm may be acceptable. Research is ongoing to identify suitable licensed source areas to provide the 900,000 cubic metres of material that can meet these grading criteria. By its very nature beach recharge is fully mixed on delivery to the beach – but once worked by the tides and waves through the natural variations that occur – the beach will self sort providing typically upper surface sandier materials with some local fine to medium gravel raised strips /deposits from stormier conditions near the sea walls. ‘

The key reasons for this preferred option are as follows;

- The historical and current beach is of a mixed sand / shingle variety and replacing like with like, rather than trying to force a foreign material on the frontage, is preferable.
- The sand / shingle mix requires less re-charge volumes than when compared with having sections of the frontage with sand dominant recharge. This helps to minimise recharge costs and the Contingency Risk required for greater variations on recharge volumes.
- This option provides consistency along the entire frontage of Clacton and Holland, and different communities will not perceive that they are being treated unequally.
- There has been informal member support for fish tail structures and this, together with the results from the public consultation, demonstrates an overall preference for this option.

Current estimates indicate the following headline costs for this preferred option are as follows;

Present Value of the Scheme and Construction Works - £28m (excluding Risk Contingency)

Broken down into;

Contribution from the Environment Agency -	£22m
Contribution from TDC / ECC -	£6m
With a Risk Contingency of -	£5m (ie 17%)

#### **Other funding contributions.**

Officers are currently in the process of seeking contributions from a number of third parties for whom a collapse of the sea defences would impact adversely upon their business. Anglian Water for example has assets that run along the seafront and there are ongoing discussions with representatives from this company to establish the level of contribution that the company will make towards this very important scheme. There are other organisations who may also be willing to make contributions based on their corporate social responsibility policies.



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<b>APPENDICES</b>
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Appendix 1 Options
Appendix 2 Consultation results