

Eastoke Point Coastal Defence Study



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Summary

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The primary objective of the present study is to develop a sustainable coastal defence scheme for managing coastal erosion and flooding risks along the Eastoke Point frontage of Hayling Island. This is a highly dynamic coastline that is becoming increasingly difficult to maintain and manage. The Southern Eastoke frontage and low-lying Sandy Point Nature Reserve just landward of the shingle barrier beaches has been flooded by wave overtopping in recent years. This affected residential properties, including a number of houses in the Sandy Point estate at the eastern end of the Eastoke peninsula.

The overall coastal defence policy for this frontage was established in 1996 in the East Solent Shoreline Management Plan and is to Hold the Line. Subsequently, in 2006, a detailed Coastal Defence Strategy Study for the whole Eastoke peninsula was carried out and considered some options for suitable coastal defence schemes for Eastoke Point that would provide an adequate standard of protection to these low-lying residential areas. The present standard of protection against coastal flooding and erosion is very low, with a few properties potentially being flooded by events with return periods of 2 to 5 years. A more severe event with a return period of between 50 years to 200 years would have the potential to flood between 30 and about 400 houses.

The 2006 coastal defence strategy for the Eastoke Peninsula identified the preferred option for the defences for the Eastoke Point frontage as “Hold the Line to a 1 in 200 Return Period standard of defence”, i.e. a 0.5% Standard of Protection. This decision was in line with guidance issued by Defra in their Flood and Coastal Defence Project Appraisal Guidance (Volume PAG3, Economic Appraisal). This recommends that defences for intensively developed urban areas (Land Use Band A) at risk of flooding or erosion at the coast have an indicative standard of protection to cope with a return period event of 100 to 300 years (or an annual probability of failure of 0.003 to 0.01). This leads to a basic underlying assumption of the present study, namely that any coastal defence scheme for Eastoke Point should be designed, built and maintained to deliver this standard of protection without any substantial landward or seaward shift in the position of the existing coastal defences.

This coastline has a long-term history of retreat and varying plan shape, as a result of rising sea levels, variations in the wave climate and changes in the position and alignment of both the deep channel through the entrance to Chichester Harbour and the banks of the ebb shoal delta that form on either side of that channel. In recent times, the evolution of this frontage has also been affected by the construction of seawalls and groynes, and by beach recharge and recycling operations. This study includes a review of all these effects as an essential background to the consideration of the future management of the Eastoke Point coastline.

Summary continued

Whatever coastal management or defence policies or schemes are implemented, they will have some impact on both the natural and human environment of this frontage and surrounding areas. Since the consideration of these effects will influence the choice of any scheme, this study has also included a review of the environmental attributes of the areas that might be affected and undertaken consultation and discussion about the concerns and hopes for any future management of the coastline and hinterland.

Turning now to the future management of this coastline, the likely consequences of either a Do Nothing or Do Minimum coastal defence policy for this frontage are re-examined and estimates made of the likely consequences of both coastal erosion and flooding, to provide an economic context for investing in a coastal defence scheme.

This study then goes on to extend the consideration of the coastal defence options for Eastoke Point that was presented in the 2006 Strategy Study. First, a large number of coastal defence techniques have been considered in the context of the particular characteristics of this very changeable section of the coastline. From these, a number of alternative coastal defence schemes were developed that will overcome the numerous environmental and practical problems at Eastoke Point, and provide a sustainable and cost-effective long-term plan to reduce the flood and erosion risks along this frontage to an acceptable level.

Using a multi-criteria analysis, the various defence options were compared both on the basis of their direct benefits, i.e. in providing a technically feasible and economically worthwhile defence that would provide the required standard of protection for the area over 100 years, and on the basis of their indirect benefits, particularly in terms of their likely advantages and disadvantages from the viewpoint of both the natural and human environment.

Using this comparison technique, three broad options seemed capable of being developed into suitable defence schemes for Eastoke Point. A further and more detailed comparison of these was then undertaken in the light of the specific morphological conditions at Eastoke Point, the views of consultees and past experience in the practical issues of beach management. When these aspects were included, a single option emerged as the preferred coastal defence approach for Eastoke Point. This option comprises the following elements, presented in the approximate order of their costs:

- A new rock revetment buried in the beach crest and running along the whole frontage of Sandy Point Nature Reserve and extending west in front of the promenade;
- Replacing the existing timber groynes along the same frontage with new rock groynes;
- Adding extra shingle to the beach as the groynes are replaced;
- Recycling the shingle to maintain even beach widths (as at present);
- Upgrading the existing rock revetment and groynes near the Lifeboat Station;
- Improving the wall at the rear of the promenade to reduce flood risks to houses behind.

This study aims to establish the coastal defence approach for this frontage in more detail than presented in the previous Sectoral Strategy Study (Atkins, 2006), and the preferred option was therefore developed into a more detailed coastal defence scheme, in which the works to be undertaken were identified for each of eleven sub-sections making up the Eastoke Point shoreline, and a programme for these works developed.

Summary continued

However, the proposed scheme will necessarily still need to be refined further at the detailed design stage, and quite probably after it as been installed to better cope with the very changeable conditions along this part of Hayling Island's coast.

The costs of this preferred scheme were calculated bearing in mind the inevitable uncertainty about the exact timing or extent of some of the elements making up the overall scheme, in particular the beach recycling and recharge operations. The approach taken has been to carry out sensitivity testing on the costs, amounts and frequency of the beach management schemes, in particular, to assess the effects of the uncertainties on the calculated scheme costs.

Bearing this possible range of scheme costs in mind, the study has gone on to examine the economic case for improving the defences at Eastoke Point, first ignoring the benefits and costs of defences along other coastlines along the Eastoke peninsula, and then reviewing the overall benefit: cost calculations for the defences for the whole peninsula. The overall conclusion of this economic assessment is that although the estimated costs of the preferred scheme are substantially higher than those presented in the 2006 Sectoral Strategy Study, there is still a strong case for implementing the scheme. The need for such intervention is already urgent and the estimation of the scheme costs has therefore assumed a very early start be made on the main elements of it. If the works are delayed and / or staged, the Present Value costs of the scheme will increase thus increasing the benefit: cost ratio presented in this report.

Finally, some specific recommendations are made for taking the preferred option on to a more detailed design and appraisal study, and for the monitoring and management of the scheme once it is installed.

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