

CALSHOT COAST PROTECTION WORKS

Wave attack on Calshot Spit is much less severe than in Christchurch Bay, due to the sheltering effect of the Isle of Wight which lies in the path of the prevailing winds. Consequently, a simpler, less costly protection system is employed consisting of larch piles groynes and revetment. Although a low capital cost system the maintenance costs are relatively high due to shingle erosion of the soft timber.

An investigation has recently been carried out to assess the cost effectiveness of using hardwood or rock structures instead of larch piles. The conclusion was that at present the overall cost of changing to more durable materials is higher than continuing with the existing system. However, the investigation identified a modified design which offers reduced maintenance and a more efficient shape for reducing wave energy.

A scheme to completely replace the existing badly eroded groynes and revetment with modified structures was programmed for 1989/90. Negotiations were held with Hampshire County Council, who would jointly fund the scheme with NFDC.

Monitoring the performance of the modified groynes was carried out by measurement of shingle accretion along Calshot Beach. This gave a clearer picture of shingle movement along the beach. This information was used to investigate the feasibility of a shingle recycling programme to remove excess shingle from the end of the spit and to use it for beach nourishment at the western end.

In the design of the scheme, rock structures were not considered to be compatible with the environment or the recreational activities, despite the fact that they are more durable and perform better than timber structures on a shingle beach.

The final design was based on work which had proved successful in similar conditions on the Norfolk coast and utilized both hardwood and softwood. Hardwood was used for the king piles and waling beams, with round larch piles used to infill the groyne panels between the piles.

This arrangement provided a reasonable balance between durability and cost, particularly as the hardwood was material that NFDC held in stock. The hardwood used was greenheart, which is harvested on a sustainable yield basis and so complies with NFDC's environmental policy.

It was recognized from the start that some minor modifications to the end sections of the groynes would be necessary, after construction, to fine tune them to the wave conditions at Calshot. This is normal practice, with timber groynes, particularly where there is a lack of good data on which to base the design. The scheme, as originally planned, included artificial nourishment of the beach between the groynes. However, it was decided to monitor how well the new groynes trapped shingle naturally from the longshore drift before money was spent on artificial nourishment and it was omitted from the final design.

The protection works were designed to be fairly short term, with an expected life of ten years. Research into coastal processes, leading eventually to a shoreline management plan (SMP) for the coast between Lepe and Calshot was already being planned. The

data gathered from these studies would be used to design more effective and durable protection works within the framework of the SMP.

Severe storms occurred in October and December 1989. They caused substantial damage to the timber revetment and led to emergency repairs being carried out in March 1990. The revetment sustained more damage during the storms of January and February 1990, necessitating further repairs.

In January 1991 the scheme was approved. In February tenders were invited to remove the remains of the old groynes and revetment, construct 29 new timber groynes and 700 metres of new timber revetment.

BEACH MONITORING

Since 1989 Calshot beach has been surveyed on a quarterly basis by NFDC. The data is processed by computer, and stored in a database which can then be used to calculate beach volumes, areas of accretion and erosion and quantities of material moving along the beach. In addition we have aerial surveys flown every year, and the images are digitally orthorectified and put on a GIS system. These can then be used to visually identify any plan shape changes. The structures are also inspected regularly for any deterioration and minor maintenance can be carried out as necessary. The surveys that we have carried out on the beach show that the groynes have been effective in trapping and retaining shingle.