

EA South West Box 11



ENVIRONMENT  
AGENCY



# Brean

## Sea Defences

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# Brean and the tides

The North Somerset resort of Brean lies on the coast-line between Burnham-on-Sea and Weston-Super-Mare.

Its maritime position has been the foundation of a thriving holiday destination attracting large numbers of visitors.

But the potential threat of flooding from high tides has constantly hung over the community.

The tidal range along the Severn Estuary is considerable and Brean is particularly vulnerable to severe westerly and south westerly winds whipping up the waves.

Brean stands at the edge of the low-lying Somerset Levels and Moors and the whole area has been subject to a history of flooding from the sea.

Archaeologists have found evidence of flooding as far back as the Neolithic and Bronze Ages.

It is thought that the first major attempts to tame the tides were made by the Romans, perhaps by constructing a sea wall.

*Front cover: The completed scheme*

The dangers from the sea continued to be recognised and the tower of nearby Berrow Church was kept permanently whitewashed as a warning to ships coming up the Estuary. In the days of sail, many a ship met an untimely end on the sandbanks. To quote an old guide book, "Shipwrecks were frequent and the lamentable spectacle of human carcasses floating to the shore was an ordinary occurrence".

Flood events could be dramatic with records of large areas under water in the great flood of 1606.

At the latter end of the 19th century, construction of a deep water harbour was begun at Brean. The project was intended to shorten the journey from America. A big storm washed away all the foundations and the scheme was then abandoned.

Various attempts were made to defend Brean but waves continued to overtop sea defences. Major events were recorded in 1859, 1903, 1910 and 1926.

More recently breaches occurred in 1981 and 1990 with considerable damage being caused.



The existing defences were deteriorating and it was clear a comprehensive solution was required to protect local properties, caravan sites and 330 hectares of low-lying farmland.

The result was the Environment Agency's £2.15m Brean Sea Defence Scheme. This leaflet tells the story of the project.

## PREPARING THE PROJECT

Consultants were appointed to assess the existing defences and advise on possible improvement works.

A major element in the success of the whole project was the emphasis placed on consultation with local residents and landowners and interested organisations including Brean Parish Council, English Nature, English Heritage and the RSPB.

## ENVIRONMENTAL CONSIDERATIONS

Environmental and heritage considerations were prominent in the preparations. Forming a backdrop to the beach is Brean Down, a carboniferous limestone promontory, 320 feet high and jutting out into the Bristol Channel for two miles. The Down is an area of outstanding natural beauty and is a haven for many species of birds. Many rare wild plants can also be found here.

The foundations of a Roman temple were discovered in 1957, and the Down has many other archaeological features dating from Iron and Bronze Ages and the Roman period.

The lower foreshore forms part of the Bridgwater Bay Site of Special Scientific

Interest and is home to wintering wildfowl and waders on the mudflats which provide a rich source of food.

All these features were taken into account when drawing up the scheme. Indeed, following discussion with English Heritage it was agreed that some archaeological investigations would be undertaken to establish the extent and depth of any archaeological deposits. Once these investigations were completed, the design of the rock revetment at this point was planned to meet their requirements.

The rock used is limestone, matching the rock of the Down. The quarry at Cheddar is local to the site, being only 18 miles away, and this local source meant that delivery of the rock by road was the only feasible option available. Delivery by barge would have meant crossing the Site of Special Scientific Interest which was not in the interest of English Nature, given that the site is a valuable bird feeding ground during the winter months.

Five specially strengthened lorries were used to deliver the rock to site. They operated throughout the work-



## THE SCHEME

Having considered all the comments from the consultation period it was decided that the best form of new defence would be a 1.4km line of rock set against the existing sea wall.

ing day, travelling back and forth between quarry and site, up to six times a day. At the peak of construction activity, approximately 600 tonnes of rock were delivered each day. (96,000 tonnes of rock and 26,000 tonnes of bedding stone were used overall.)



The placing of rocks required careful organisation by the contractor to ensure the quarry's rock blasting programme kept up with the planned placing operation on the beach.

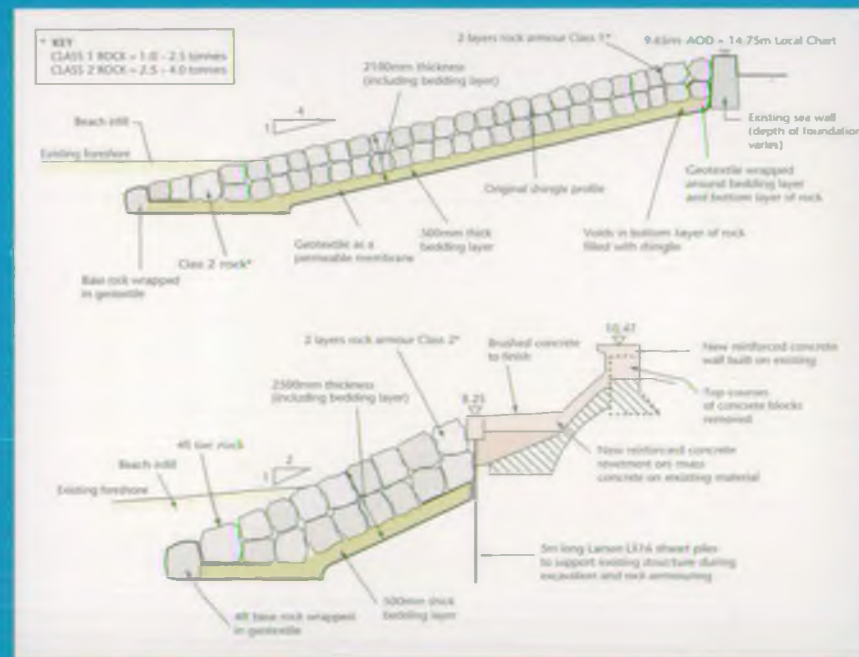
Once transported to the beach, the rock was stockpiled above the high water level and close to its intended placement position. Each rock was then individually placed by a tracked excavator under the guidance of the contractor's site staff.

The rock armour revetment was constructed in bays of approximately 10m width along the length of the scheme.

Underlying clay had to be excavated before rocks could be seated properly. Each bay usually took two days to complete depending on tidal conditions prevalent at the time.

In the Autumn of 1997, new floodgates will be installed to replace stop-boards at both slipways on the Brean sea defences.

Because Brean is such a popular tourist resort, it was agreed that work would be carried out in two phases outside the holiday season. The first phase was between mid-February to end of March 1996, and phase two was between September 1996 and May 1997.



Cross sections of the scheme

Work in progress...

EA-South West/99-7 ✓

The completed defences



**OTHER WORKS**

Defences along the River Axe were also found to be inadequate and works costing around £150,000 have been agreed, and work will start on improving 1 kilometre of banks along the river. These works will also be in two phases - Autumn 1997 and Spring 1998. This is to avoid any severe winter weather affecting the works.

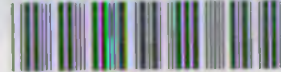
**SCHEME ACKNOWLEDGEMENTS**

An opening ceremony to mark the completion of the sea defences was held on 19 September 1997.

The Scheme was approved by the Environment Agency's Somerset Local Flood Defence Committee and grant-aided by the Ministry of Agriculture Fisheries and Food.

Sir William Halcrow & Partners Ltd were the scheme consultants. The construction was carried out by Amec Civil Engineering Ltd.

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