

EA South West Box 11



NEW DEFENCES FOR CHRISTCHURCH

Curbing the floods



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Curbing the floods

New Defences for Christchurch

The Dorset town of Christchurch lies at the head of Christchurch Harbour, and the confluence of the rivers Avon and Stour. The narrow harbour entrance - called The Run - reduces the force of the tides from the English Channel. During spring tides the tidal range can still reach two metres. Another characteristic of Christchurch Harbour is double peak tides. The town has suffered flooding problems, particularly the low-lying Bridge Street area.

Much of Bridge Street is within a Conservation Area, which includes 20 Listed Buildings, and a Scheduled Ancient Monument; Town Bridge.

The Avon Valley is recognised as an internationally important area for wildlife. It is a Site of Special Scientific Interest (SSSI) and a proposed Special Area of Conservation as a result of it exhibiting the widest range of habitats and hence greatest diversity of flora and fauna, found in any chalk river in Great Britain. Through Christchurch the mean high water mark is the boundary of the SSSI.

The river valley and floodplain also qualifies for protection under the Ramsar Convention and is a Special Protection Area.

In 1994 the town celebrated the 900th anniversary of its Priory, which reflects the history of Christchurch as a settlement. For example, Bridge Street was originally an ancient trackway across marshland.

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Saturday 16th December 1989

A History of Flooding

Flooding by tides and high river flows on the River Avon in Christchurch has been a regular occurrence. Although serious river flooding has occurred - for example in 1960 - flooding in the Christchurch area has been dominated by tidal events. The most recent major flood was in December 1989 when 40 properties in Bridge Street were inundated above floor level by high tides.

In the past it was not unusual for Christchurch Borough Council to sandbag properties in Bridge Street two or three times a year. When Bridge Street flooded disruption to the town centre was considerable as it is the site of the town's main bus terminus. Numerous bus routes

were affected and closure of Bridge Street due to flooding made it difficult for heavy vehicles accessing the town centre.

The flood risk area includes the island between Town Bridge and Waterloo Bridge, and the left bank of the river from the Council offices to the Stony Lane roundabout.

The Lower Avon flood defence scheme was designed to minimise the flood risk to more than 90 properties, which include the listed buildings, houses, shops and industrial units. A further 20 properties will be protected by the defences against the threat of rising sea levels caused by global warming.

The Scheme

Before the scheme was given the go-ahead in 1993, detailed consultation and surveys on planning, conservation and archaeological issues were carried out.

The initial feasibility study was undertaken by Christchurch Borough Council.

As stretches of the defences are adjacent to residential properties, the property owners were individually consulted to determine the best alignment in order to minimise the impact on this valued river frontage.

The Lower Avon flood defence scheme has been carried out in an environmentally sensitive way and includes a new wetland area and landscaping. The defences were completed in two stages.



Upstream of Town Bridge (Stage Two)



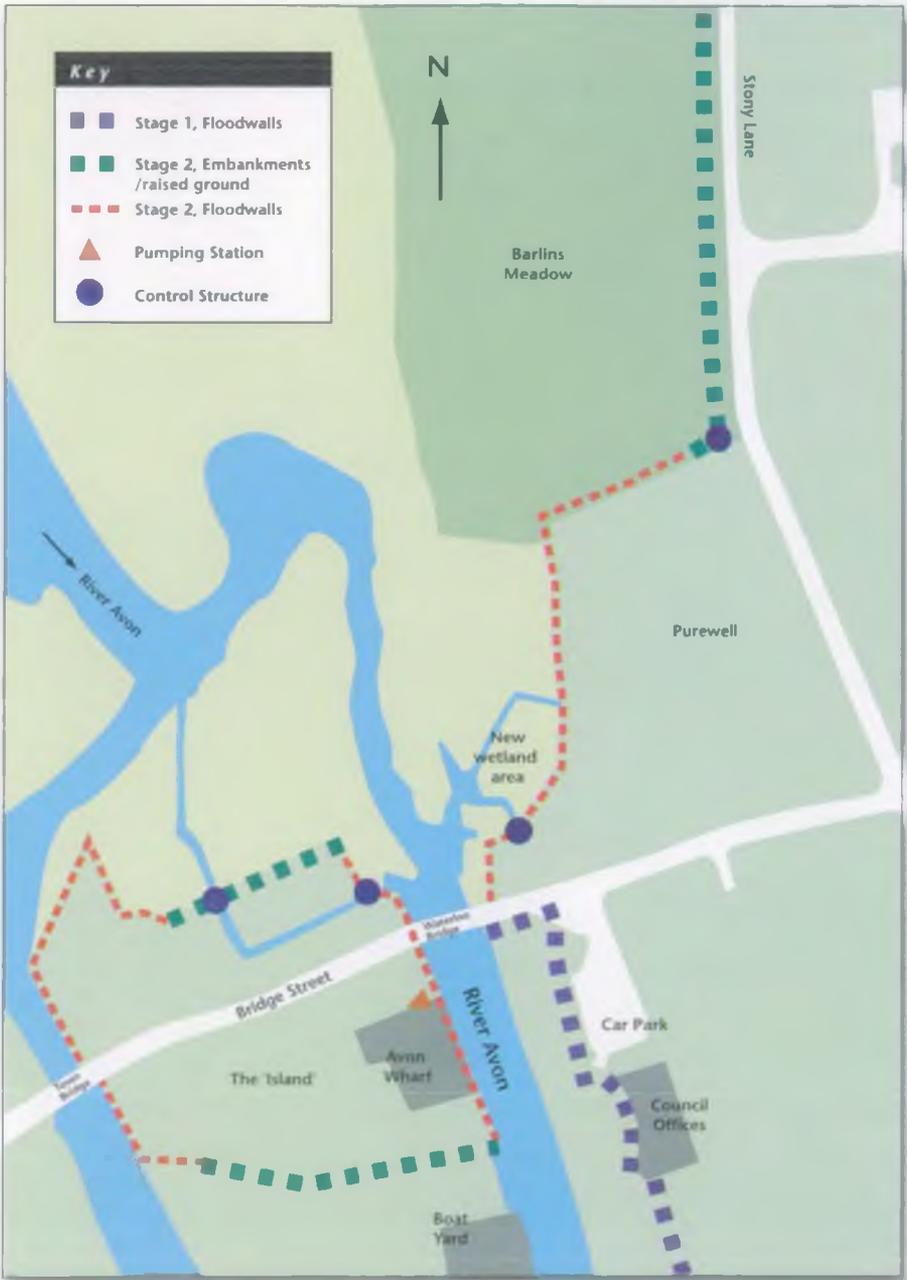
Town Bridge

Stage One

A flood wall was built alongside the Council offices south of Bridge Street during spring 1994. The 300-metre-long wall - designed by Christchurch Borough Council - stretches from Waterloo Bridge to Stanpit golf course and is faced with hand-made bricks to match the offices.

Construction was carried out by the in-house emergency workforce of the National Rivers Authority - predecessor to the Environment Agency - and completed at a cost of £175,000.





Plan of Lower Avon Defences, Christchurch



◀ *Upstream of Town Bridge*

▲ *Saxon Court*

Stage Two

These works also took place north of Bridge Street, concentrating on Purewell and The Island. Work began in February 1996 and was completed in February 1998, at a cost of £2.6 million. The new defences prevented flooding in Bridge Street in January 1998, when tidal flood warnings were issued for Christchurch.

The defence is a combination of flood walls and flood banks, built to suit each particular location. They are typically one metre above existing ground level.

Gravels underlying this area of Christchurch are highly permeable and so the scheme incorporates an underground barrier. This is formed by using steel sheet piling, driven seven metres deep.

An underground pumping station has also been built at Avon Wharf to pump away excess rain water and seepage trapped by the defences during high tides.



Brigands Creek gate ▲
under construction



Avon Wharf ▼





On The Island - between Waterloo Bridge and Town Bridge - some 500 metres of flood wall have been constructed from the steel sheet piling and reinforced concrete. The wall has been clad with natural Purbeck stone to blend with the built environment.

Purewell is protected by a combination of steel sheet piling and earth embankment. A 500 metre stretch of defences runs from Waterloo Bridge to the roundabout at the north end of Stony Lane. Hedge, tree and shrub planting provides screens to the steel piles.

The work on the flood defences was carried out in 10 linked zones to minimise the affect of this major construction project on the town.

Conservation Enhancement

The Agency has liaised closely with conservation bodies and Christchurch Borough Council throughout the scheme in order to safeguard the important features of the area. In particular many large mature trees were preserved and protected during the engineering work. New trees and bushes have also been planted to screen the defences.

A reed bed, pond and wetland area was formed in the Barlins area. Hedge, tree and shrub planting, including climbers - all of native species - have provided cover, potential nest sites, and improved the landscape.

The wall at Saxon Court is listed and new brickwork was made to match existing walls.

Scheme Acknowledgements

The project was approved by the Environment Agency's Avon and Dorset Local and Wessex Regional Flood Defence Committees, and was grant-aided by the Ministry of Agriculture, Fisheries and Food.

Project design:

Stage One: Christchurch Borough Council

Stage Two: WS Atkins, Exeter.

Construction:

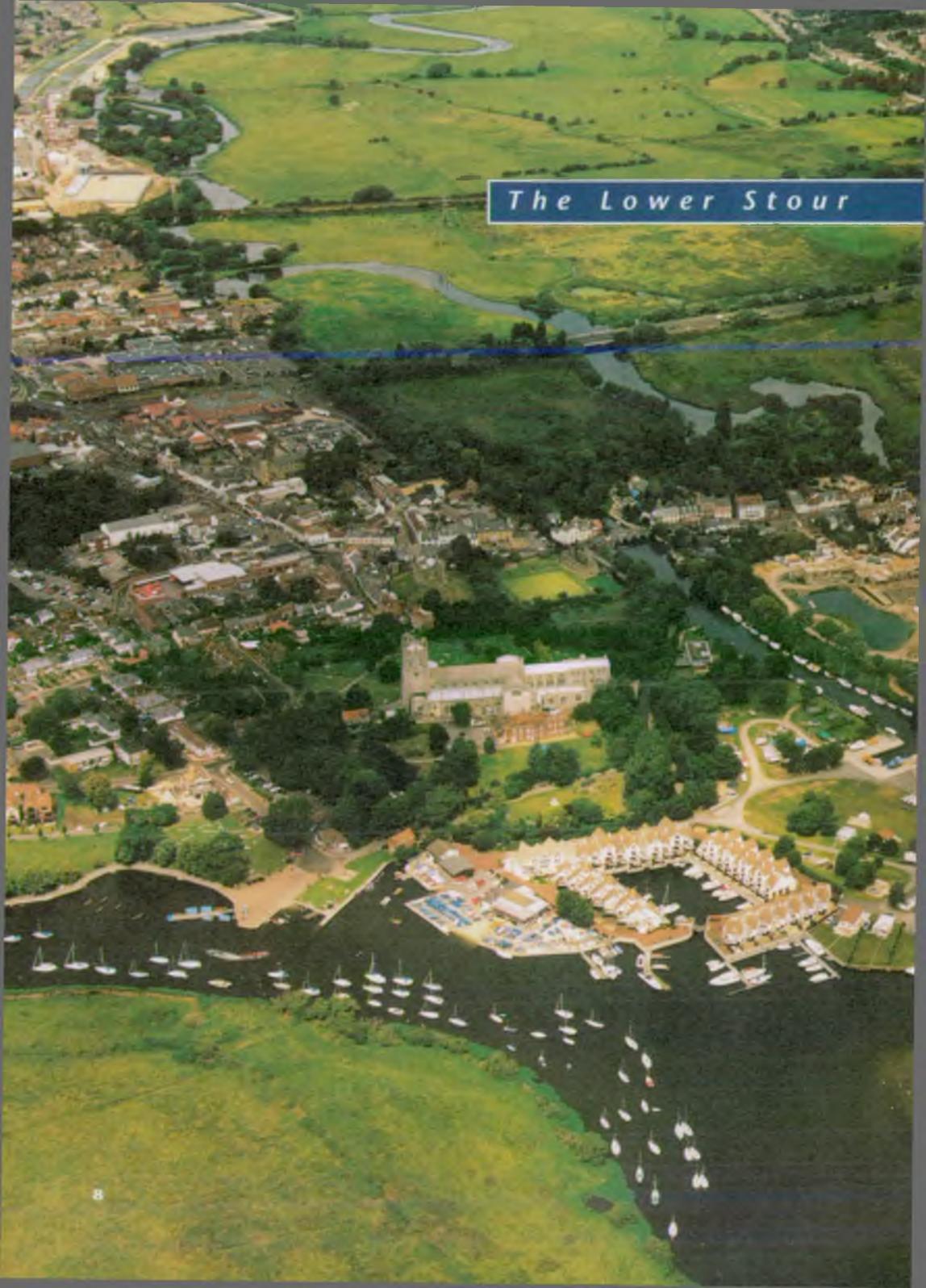
Stage One: In-house emergency workforce

Stage Two: Dean & Dyball Construction, Ringwood

Archaeological assessment:

Southern Archaeological Services Ltd, Southampton.

An opening ceremony to mark the completion of the flood defences was held on 25 September 1998.



The Lower Stour



Christchurch has also suffered severe flooding from the River Stour, which joins the Avon at Christchurch Harbour.

Flooding occurs from both high river flows and high tides. A major flood defence scheme was designed by the National Rivers Authority to minimise the flood risk to around 900 properties in Christchurch and 24 properties in Bournemouth. This scheme - completed in 1992 - is now maintained by the Environment Agency from their area office in Blandford Forum.



lford golf course floodbanks

Where reduction of flood levels was not practical flood banks and walls were constructed to prevent flooding.

The works on the Stour were carried out in nine contracts between 1987 and 1992. The project was developed in close liaison with Christchurch Borough Council, the main landowner involved. Works comprised:

- Clearance of flood arches to the lford Bridges and lowering of the approach ground levels to and between the bridges;
- Reduction of the level of the flood plain by about one metre where it had been used for disposal of domestic refuse in the past;
- Dredging of surplus silt from five kilometre length of river between the weir at lford golf course and Christchurch Harbour;
- Construction of reinforced concrete flood walls faced in brick or reconstructed stone and earth flood banks from 1 to 2.5 metres high throughout the length of the scheme from Grove Farm Caravan Park to Christchurch Quay;



A section of the Lower Stour flood wall

The Lower Stour Scheme for Christchurch was originally phased over a period of six years, with nine stages of work reflecting a total investment of £3.45 million. After initial appraisal, hydraulic modelling and design were completed the first contract started in early 1987.

The overall length of the scheme is 5.3 kilometres, with 1.7 kilometres of flood walls and 2.3 kilometres of earth banks.

The general principles of the scheme were to lower flood levels by means of:

- Dredging accumulated silt from the bed of the river;
- Opening up obstructed flood arches at existing bridges, and
- By lowering areas of flood plain previously raised by disposal of waste material.

- The flood banks generally are inclined at 1 in 4 or flatter, to ease mowing, access and maintenance. There is also a section of reinforced earth bank with steeper faces to limit land take through the Iford Golf Course where space was restricted;
- In order to maintain access, vehicular and pedestrian ramps, pedestrian stepped access, and flood gates were installed.

Main Contracts

Stage 1: Iford Bridge Clearance
CBS Construction Ltd, Romsey

Stage 2A: Dredging *Dean & Dyball Ltd, Poole*

Stage 3: Bernards Mead *C J Lee & Sons Ltd, Damerham, Fordingbridge*

Stage 3A: Beaulieu Gardens *In-house workforce*

Stage 4A: Iford Golf Course Defences
Dyer & Butler Ltd, Southampton

Stage 4B: Golf course flood wall *Dyer & Butler Ltd, Southampton*

Stage 4C: Tuckton Defences *CBS Construction Ltd, Romsey*

Stage 4D: Quomps *In-house workforce*

Stage 4E: Wick Farm *In-house workforce*

The Lower Stour defences were funded by the National Rivers Authority, Christchurch Borough Council, and Pontin's Ltd, and grant-aided by Ministry of Agriculture, Fisheries and Food.

Maintenance

Routine maintenance of the Lower Avon and Lower Stour defences is managed by the Environment Agency's area flood defence team. This is based at the South Wessex Area Office in Blandford Forum.

Scheme Operation

The Environment Agency operates a 24 hour flood warning service. The area flood defence team uses meteorological information, appropriate to the warnings issued, to direct the in-house emergency workforce to operate control structures in Christchurch.

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DEVON AREA OFFICE

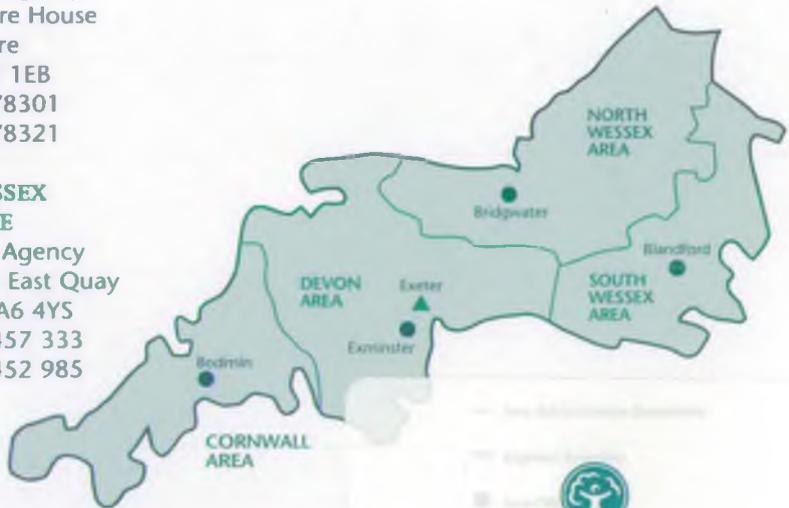
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For general enquiries please call your local Environment Agency office. If you are unsure who to contact, or which is your local office, please call our general enquiry line.

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