

EA-South West/02-13

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## **Beneath the town**

Safeguarding Bodmin from flooding



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# Beneath the town

## Safeguarding Bodmin from flooding



▲ Map of Bodmin showing the course of the leat

### Background

Bodmin is the old county town of Cornwall, with a resident population of around 13,500.

The town leat - a tributary of the River Camel - is a watercourse which rises to the east of the town.

The leat springs from the Castle Canyke area and flows in a northwesterly direction through the town centre to join the Camel approximately one kilometre west of the town.

The leat is not visible for much of its course through Bodmin - running through man-made pipes or culverts beneath the town. Upstream and downstream of the town the leat is visible as an open stream.

A tributary enters the leat at Flaxmoor Terrace, known as the Flaxmoor Stream.

The leat is an important historical and archaeological feature and lies close to remains of the 12th Century Priory of St Petroc and St Mary. Many mills have used the leat's resources.

During the medieval period the leat was used by the Augustinian Priory (c1120 - 1539AD) to supply the priory fish and millponds.

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## History of flooding

Major flooding occurred in Bodmin in September 1976, December 1979, July 1987 and September 1993. During these events properties were flooded up to 1.2 metres deep in Church Square and Crockwell Street.

In 1976 the Cornish Guardian newspaper of 30 September reported: *'In Bodmin more than a foot of water burst into premises in Church Square, including the Duke of Cornwall public house and the Bodmin Sports and Social Club.*

*'Duke of Cornwall customers waded out to retrieve beer barrels which had floated into the square.*

*'At the social club members stood on tables with their drinks after nearly 18 inches of water surged down the alleyway leading to the premises'.*

One of the contributing factors to flooding was insufficient capacity in the leat. The structure of the leat varied considerably

throughout its length and several sections were in very poor structural condition.

This leaflet outlines the problems the leat presented to the town and the improvement work the Environment Agency carried out between 1999 and 2001.

## The leat - what were the problems?

- Risk of flooding to properties and shops, especially in the Church Square area
- Disruption to the main road through Bodmin during flooding
- Stretches of the culverted sections of the leat were in poor condition, with the consequent danger of collapse
- Existing services and blockages in the leat caused restricted flow and thereby reduced capacity
- Development in Bodmin was on hold because of the leat constraints
- Access to the culverted sections of the leat was poor when maintenance work was necessary.



▲ Beneath Crockwell Street, Bodmin



## The scheme

Following an intensive survey of the leat - including a close circuit television survey - the Agency prepared a scheme to help reduce the risk of flooding to Bodmin. The purpose of the scheme was to:

- Minimise the risk of flooding by:
  - Increasing the hydraulic capacity of the leat
  - Providing upstream storage during periods of high flow
  - Reducing the risk of blockages in the leat
  - Reducing the risk of collapse due to structural failure.
- Accommodate additional run-off from any further development of Bodmin.
- Provide for safe maintenance of the leat.



▲ Priors Pond

The scheme - designed and supervised on behalf of the Agency by William Halcrow & Partners Ltd - comprised a combination of rehabilitation and online culvert replacement. Retention facilities - where floodwaters are held back until flows subside - have been built at the Priors Pond and in the Gilbert Road area. Services have been diverted from the leat wherever these caused an obstruction to flows.



▲ Surveying the leat. Inset: Underneath Demisson Road car park

## Works carried out

The Agency's emergency workforce and Bodmin based contractor Brent carried out the £1.5 million scheme which included:

- Installation of a new 900-millimetre diameter pipe and trash screen in the vicinity of Cummings Garage.
- Construction of a new culvert beneath Gilbert Road.
- Works to increase the channel capacity in the vicinity of Priory Cottage.
- Provision of a flood storage pond in the recreation field including reopening the leat which was previously buried in a pipe.
- Construction of a new length of culvert at Bodmin town football club.
- The volume of Priory Pond increased by 1500 cubic metres (330 thousand gallons) to help store flood water. This has been achieved by building a new

low wall at the edge of the pond. The wall has been faced with local stone.

- Surface water sewers diverted away from the vicinity of Church Square and into Priory Pond. Hydrocarbon interceptors were installed to prevent the pond being polluted with oil.
- Structural rehabilitation of the culverted sections of the leat, which were in poor condition, as identified by the internal structural survey of the culvert.

A combination of techniques were used:

- Laying new pipes;
- Inserting a liner into the old pipe to act as a new pipe;
- Localised repairs of the culvert by man entry;
- Inserting a resin - impregnated 'sock' liner into the culvert.
- Removal of blockages and services in the culvert.



▲ Painting the culvert walls beneath Berrycoombe Road, Bodmin. Inset: Constructing a manhole near Scarlett's Well Road, Bodmin



St Petroc's Well is situated in Priory Park and as part of the flood defence scheme the Agency restored the area surrounding it. The well is named as St Guron's Well in 1635 and in a document dated 1639 it is mentioned as St

Jerome's Well. Built of granite it was once fitted with a door of simple design and is thought to have been part of a tenement within the grounds of the Priory.



### Archaeology

The Environment Agency has a responsibility to ensure any works it undertakes do not have an adverse effect on archaeological areas.

Because of the known wealth of archaeological remains in and surrounding Bodmin archaeologists from the Cornish Archaeological Unit were brought in to study the proposed route of the flood defence improvements.



They studied an area near Priory House and a number of skeletons and other remains were discovered in what appeared to be a medieval graveyard. Medieval cemeteries are very rare in Cornwall, as most sites have tended to continue in use until the present day.

Three walls of a corner of a building – thought to be an 18th century outbuilding associated with Priory House - were also

▼ Priory Park







▲ The grave stone was discovered where it lay as a lintel

found. The wall contained an alcove, with a re-used 12th-13th century cross slab grave cover as its lintel.

In all, 82 artefacts - pottery, stone, iron and glass - were unearthed in September 1998 and the discoveries drew large media attention.

Because of the archaeological significance of the discoveries, the Agency amended its scheme in order to minimise any impact on the area.

▼ *Priory Park*



◀ Drawing of the 12th-13th century grave cover

### Funding

The scheme was funded by the Agency's South West Regional Flood Defence Committee, North Cornwall District Council and Cornwall County Council and the scheme received grant-aid from the Department for Environment, Food and Rural Affairs.

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