



Cheltenham flood alleviation scheme

Your questions answered



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The beautiful and historic town of Cheltenham is believed to have taken its name from the word 'Celtenhamme' meaning 'the town under the hill.' It is located on the western edge of the Cotswolds, an Area of Outstanding Natural Beauty.

The town, which has a population of some 110,000, is located on the banks of the River Chelt, a tributary of the River Severn. The Chelt runs through the town centre, often hidden from view in underground, man-made culverts.

Over previous centuries, the river's power was harnessed to help the town prosper. As industry grew, the river was diverted from its natural course up to higher ground in order to feed the great mills. Most of the riverside was developed as the town grew, especially during the 18th century, when the town's famous natural spa waters were discovered.

The original river valley has been heavily developed with housing estates, public buildings and industrial sites.



Cheltenham town centre

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Why is flooding a problem?

Though the River Chelt flows largely unseen through culverts under the town, it still poses a severe flood threat to local people and businesses.

The last major flood was in 1979, over 20 years ago, almost out of most people's memories, and only minor floods have occurred since. However, it was only by good fortune that Cheltenham and the Cotswolds escaped the heavy rain that caused such devastating flooding in the Midlands in Spring 1998 and Autumn 2000.

It is at greatest risk of flooding from thunderstorms in the surrounding hills, particularly during the summer.

The Chelt is a very short, steep river, coming down from the Cotswolds which is prone to quick flooding.

It reacts to heavy rain quickly and flooding can occur within 2 hours. There is often no time to issue flood warnings or to prepare for flooding.

Between Dowdeswell Water (formerly Dowdeswell Reservoir) and Cox's Meadow, other tributaries run into the Chelt, contributing to the town's risk of flooding during heavy rainfall.

When flooding starts, the water spills over from its historic man-made course and runs down to the valley to find its natural course which now contains many of the town's buildings. As a result, properties built in the original river valley are very vulnerable to flooding.

The culverts, which take the river under part of the town, are very difficult to repair and maintain. Many are over 100 years old and in a state of serious disrepair. They are also very narrow and at times of flood inadequate to contain the necessary volumes of water.

If a major flood struck Cheltenham again, it would be a potentially devastating event for the town, its people, economy and ecology.

It is estimated that 600 properties are at risk in the event of a 1 in 100* year flood event.

** Floods are categorised by their size and frequency with which they can be expected to occur. A 1 in 5 year flood is one that has a 20% chance of happening in any year – this is a relatively minor flood. A 1 in 100 year flood has only a 1% chance of happening in any one year, but its effects can be enormous.*



A family struggle through a flooded street in Cheltenham, 1979



A car submerged in a flooded River Chelt at the ford in School Lane, Charlton Kings, 1979

'That the Chelt could 'get its back up' in the way it has on two or three occasions during the present rainy season must have been a surprise to those who think of the stream merely as a last home for tins, old boots, brick bats and other unconsidered trifles. Watching the flow deepened my respect for our river.....'

Report from the Cheltenham Chronicle and Gloucestershire Graphic, Saturday June 7, 1924.

What would happen in a serious flood?

- flooding could begin upstream of Sandford Mill, spilling into Cox's Meadow along with overspill from Lilley Brook
- the A40 trunk road, Sandford Mill Road and Old Bath Road and many houses alongside might become flooded
- the fire station and brigade headquarters would be at risk of flooding, as well as homes in the vicinity, with College Baths Road forming a flood flow path
- flood waters would overtop Keynsham Road to inundate Sandford Park and along Bath Parade to Bath Road, invading property on both of these roads
- while recent floods have not affected the town centre below Bath Road, more severe floods would invade properties within an area extending from Bath Road to St James Square including Oriel Road, Wellington Street, Imperial Square, The Promenade, St Georges Road, Regent Street, Royal Well and Royal Crescent. This area includes the council offices, principal shopping areas, the Town Hall and many other architecturally important buildings.



College Baths



Cheltenham Fire Station headquarters



Town Hall



Dowdeswell Water

What is the solution?

To provide an effective flood alleviation scheme for the town in order to protect it from flooding.

Following the 1979 flood, Cheltenham Borough Council carried out some improvements to the river to reduce flood risk. However, by the 1990's, it became apparent that the council did not have sufficient resources to complete the work and in 1996

responsibility for the river was transferred to the Environment Agency. Flood alleviation work, which had been carried out by the council included a new widened culvert under the promenade and an additional by-pass culvert through part of

the St James' Station site. After the transfer of responsibility, the Agency began construction work in 1999. The work is being undertaken in stages, some in collaboration with developers, and will cost in the region of £22 million.



The flood alleviation scheme for Cheltenham is being spread over a number of years so that minimum disruption and inconvenience is caused to the town.

The flood alleviation scheme has been broken down into eight phases as detailed below. So far, Phases 1, 2, 3a and works to Dowdeswell Reservoir have been completed.

1 Initial works extended from the Bristol–Birmingham railway line to the downstream outskirts of the town and involved construction of an additional culvert under Princess Elizabeth Way, reconstruction of six bridges, channel improvement works and floodwalls. This was completed in 2002.



Kierle Walk, downstream of Princess Elizabeth Way

Environmental benefits of Phase 1 were:

- in channel planting using bio-rolls to improve the ecological value of the river
- incorporation of gravel into the riverbed to provide habitat for invertebrates and suitable substrate for fish spawning
- riverside and bank-top planting of native trees and shrubs
- incorporation of artwork into the river scene.



Work in progress during Phase 1

2 This involved the building of an additional culvert under the Bristol–Birmingham railway line. The existing culvert, installed when the railway line was built, was inadequate for flood flows. The additional culvert was constructed during two weekend railway possessions in Autumn 2000 to improve the flood conveyance under the railway track.

3a Next to the railway line, an existing culvert under disused industrial land was removed and replaced by an open channel in Autumn 2001. It is better to construct open channel in preference to culverts wherever possible.

The environmental benefits of Phase 3a were:

- opening up 70m of river that was previously in culvert
- incorporating of gravel into the river bed to improve the ecological value of the river
- retaining the value of the area as a haven for reptiles.



Phase 1 at Arle Park

Dowdeswell Water

A vital part of the scheme was the conversion of Dowdeswell Reservoir to a flood storage area in 1999, which has already had a beneficial impact on reducing flood risk. The renamed Dowdeswell Water now helps to accommodate excess rainwater, limiting flooding in Cheltenham. The conversion has also resulted in many environmental benefits for the area.

These include:

- lowering the water level in Dowdeswell which provided the opportunity to improve the riverside flora, both through planting and natural colonisation
- successful creation of a new native white-clawed crayfish habitat
- creation of pools to improve the overall ecological value of Dowdeswell Water
- construction of a footpath around Dowdeswell Water with bird hides strategically placed for viewing the many species of birds that breed at the reservoir including Kingfisher and Great Crested Grebe
- the Environment Agency, Severn Trent Water and the Gloucestershire Wildlife Trust are working together to ensure that the wildlife value of Dowdeswell Water and the nature reserve as a whole is optimised.

What are the next stages and timescales?

Phase 3b

This is planned for Spring 2004. It involves the building of a new flood wall to protect Arle Avenue and the Cheltenham Trade Park. In order to remove a culvert that forms a constriction to the channel, an extension to Alstone Mill will be demolished, although with an eye to conservation, the main mill building will remain. A local archaeologist will be consulted throughout the whole of the demolition to log and preserve any historic findings. Access along Arle Avenue will be maintained by a new footbridge.

Waitrose site – When the recent Waitrose development was constructed the developer was required to increase the capacity of the river channel through the site. This work is now complete.

Cheltenham combined works contract

Phases 4, 5, 6 and 7 of the scheme covered the works to the river between Cox's Meadow on the upstream side of the town to the St James' Station site downstream of the town centre. Recognising that each phase affected the adjoining phases, the Environment Agency has combined them into one overall scheme called the combined works contract. We will work with Halcrow, Jackson Civil Engineering and Arup on the scheme.

To devise a scheme in the heart of Cheltenham that would have the least impact on people and the environment while keeping the river flowing at all times has proved difficult. However, a scheme has been developed which we believe is the optimum solution for the town. This work will commence in Spring 2004 and is expected to last up to three years. It will involve:

- turning part of Cox's Meadow into a second flood storage area to take the overspill flood water, instead of it flooding the town. At other times Cox's Meadow will still form a public amenity and will be enhanced with the creation of the newly landscaped area, with more planting. Unfortunately, due to health and safety reasons, large events will no longer be held there. This is because there is no flood warning system on the River Chelt.
- The cycle path will remain but may be realigned slightly in local areas. Dog-walking will continue once the works are completed
- the 'part-time' flood water storage area will go some way towards reducing Cheltenham's susceptibility to flooding and will work in tandem with Dowdeswell Water's new flood storage facility, which is already up and running.

Cox's Meadow will still form a public amenity for local people to enjoy

What will be happening in the town centre?



Sandford Park

- some of the existing Victorian culverts will be upgraded
- floodwalls will need to be built around the back of some town houses, College Baths and the fire station
- in Sandford Park, some formal defence is necessary to protect property on the right bank
- a floodwall will be provided around the section of Sandford Park upstream of College Road to protect the properties along College Road and prevent the water from entering Bath Parade and flooding properties there
- an additional culvert needs to be constructed underneath Lower Sandford Park to take the floodwaters from upstream of College Road back to the river
- culverts under Bath Road car park, Keynsham Road, Sandford Mill Road and Old Bath Road will be replaced with new wider ones and the river channel improved locally
- a floodwall will be built around the helipad of the hospital but this will be at a low level and the ramp to the hospital will be retained. Discussions will take place with the hospital during construction.

Environmental benefits of the combined works contract

- wetland and wildlife meadow will be created at Cox's Meadow
- public access to Cox's Meadow will be maintained and where possible, enhanced, including dedicated walkways and cycle ways
- there will be channel enhancements to improve the brown trout habitat throughout the combined works contract phase of the works
- mammal runs will be incorporated into all new bridges and culverts to reduce the risk of otters and other wild mammals becoming road casualties
- bat roosts and bird boxes to be incorporated in new structures
- a two-stage sinuous channel will be created to maintain flows during normal conditions and to improve the ecological value of the river
- there is a possibility of providing fish passes on obstructions to fish movement to allow trout to migrate upstream to spawn
- weirs to be removed where possible to improve fish migration
- there will be channel and bankside planting of native flora to improve the ecological value of the river as a wildlife corridor
- the landscape and amenity value of Sandford Park will be maintained and improved
- there will be channel and bankside improvements to improve the habitat and provide nesting opportunities for Kingfisher and Dipper.



Dowdeswell Water will work in tandem with the part-time storage area at Cox's Meadow



Crayfish pool at Dowdeswell Water

How will the interests of the town be safeguarded?

- the scheme must protect against a 'one in hundred year' flood while preserving the architecture and landscape of Cheltenham
 - the works need to cause the least amount of disruption to residents and businesses during construction
 - during all their works in Cheltenham, the Environment Agency will comply with its statutory duty to promote the conservation of the town's environment and achieve a positive environmental effect
 - an archaeologist will be at hand to ensure that any historical finding will be extracted and carefully logged as the work progresses
 - during some of the work in the town, the main access road to the car park will be closed while the work is carried out. Work may also temporarily affect another two car parks in the town. We will keep disruption to a minimum as much as possible
 - as many as possible of the mature trees in Sandford Park will be maintained. It is our intention to retain all trees that are not in the line of flood defence works but there are several areas outside of the
- park areas where a large number of trees will need to be removed in order to enlarge the channel and rebuild walls. Due to space constraints, it is not possible to replant all trees but it is our objective to ensure that there is an overall environmental improvement to the river and as such in-channel and bankside improvements will be carried out wherever feasible to improve the ecological content of the river
- access will be improved along the river wherever practical, to enable essential maintenance so that future generations will also benefit
 - an environmental corridor is being created along the River Chelt, which could enable the Chelt Walk to be extended in future, by Cheltenham Borough Council
 - other opportunities have been identified, some of which are already up and running, to enhance the river in partnership with other landowners and the council
 - where the river passes through formal parkland and amenity areas, consideration is being given to minimising the effect on the environment by permanent improvements
- the habitat for brown trout and other fish will be preserved and where possible, enhanced along the whole reach of the works
 - all the materials used are in line with the Environment Agency's 'Best Environmental Practice.'



The culvert under Bath Road car park will be replaced with a wider one



Rodney Road car park, which may be temporarily affected by the works



What are the plans for the future?

Throughout the whole of the Cheltenham Flood Relief project, the likely environmental impacts of each part of the work is taken into consideration and assessed by an ongoing process called an Environmental Impact Assessment (EIA).

The EIA will allow the Agency to consider different options during the design of the project in order to optimise the positive effects and minimise any negative effects. It also ensures that environmental considerations are given a central role, alongside financial and other matters.

Extensive consultation will take place between October 2003 and March 2004, where local people will have the opportunity to comment and contribute.

For further information on the Cheltenham flood alleviation scheme, please contact Emma Smailes, Project Manager, Environment Agency by emailing her at: emma.smailes@environment-agency.gov.uk or by ringing our regional office.

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