

# Bristol City Docks Infrastructure Upgrade

**Client :**  
Bristol City Council

**Designer :**  
Arup

**Location :**  
Bristol

**Date :**  
2008 - 2010



Bristol's floating harbour has existed at the heart of the City for more than 150 years. An assessment report by Bristol City Council in 2006 found there was a "significant risk" that the lock gates could fail, causing the city's harbour to drain. This could lead to the collapse of the floating harbour walls and subsidence to buildings nearby.

## **Precision mechanical engineering**

The new hydraulic/mechanical equipment had to be manufactured and installed to sub millimetre accuracy. These precision items were then located with existing civil arrangements on site and an extensive period of commissioning enabled final adjustments to be made to ensure a successful marriage between Victorian arrangements and modern methods.

## **Design and manufacture of a limpet dam**

To access the base of the lock, BAM Nuttall needed to build a dam that would use hydrostatic pressure to allow a working area at the lock bottom without draining the water away. This was designed around an existing tubular pile taken from storage, with divers' surveys of the existing lock confirming its profile. The dam was constructed in-house and then delivered to site and installed using a crane barge. This was subsequently modified and reused in Phase 2 of the project to install another set of lock gates.

## **Refurbishment of the swing bridge**

The existing water hydraulics needed upgrading and replacement with an oil hydraulic system, controlled via the new electrical system for the lock. The existing bridge weighed 540tonnes and experienced uncontrolled movement when operated due to its outdated operating equipment. The new works prevented the bridge creeping under braking, locked it in position when not in use, provided buffers to cater for E-stop situations and changed the operational approach from a chain pull system to a push-pull torque arm system. All these works had to be undertaken with the bridge remaining open to road traffic.

## **Public liaison**

The scheme benefited from overwhelming support from the community with much interest due to its enormity and technical complexity. Public liaison was led by a dedicated member of the team. The public were kept informed through regular liaison meetings, media days and presentations, a dedicated project website, posters and newsletters.

BAM Nuttall's scheme has assured the future effective working of the docks and enhanced the security of Bristol's historic flood defences.

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