Flood Modeller Pro

Flood modelling for the London 2012 Olympic and Paralympic Games

The London 2012 Olympic and Paralympic Games were centred on the Olympic Park in east London, which included a number of new sports venues, and attracted over 180,000 spectators a day. The Games were the catalyst for transforming 2.5 km² of land in east London, equivalent to the size of Hyde Park.

The Olympic Park is in the River Lee catchment which drains an area of some 1,400 km² including much of North London. Within the Olympic Park the River Lee splits into three rivers; Old River Lee, City Mills and the Water Works. These tidal river form important features within the Olympic Park (see photo). Flood Modeller Pro's 1D solver was used to help assess and design components of the Olympic Park infrastructure.

In 2007, the Olympic Delivery Authority submitted the Olympic and Legacy Facilities Planning Application. This included the first flood risk assessment for the Olympic Park. As required under the Planning Policy Statement 25 (and now the National Planning Policy Framework), various probabilities were modelled. However nothing smaller than a 1 in 20 year event was investigated, meaning flows less than 1 in 20 years (functional flooding) were not considered.

Additional modelling was required, particularly a knowledge of the fluvial regime within the waterways due to the lack of data between low and flood flows. Additionally, consideration of operational and in-channel controls was required due to the numerous changes made to the rivers, banks and floodplain.

Modelling and application

Atkins enhanced existing Flood Modeller Pro 1D models of the river system making use of the flexible tools and features within the software, including ORIFICE units for the new tide gates, GATED WEIR units for the fish belly and lock gates and an ABSTRACTION unit for the fish pass.

Flood Modeller Pro's logical RULES function were used to simulate gate control so that as the tide changes, the gate crest is adjusted to maintain the target impounded water level.

The software was also used to set the trigger levels whereby Park Operations could lift a mesh security fence which was located below the water level and could be swung open across the river in times of flood.

Modelling was undertaken to test the water levels under near normal flows which revealed that the planned riverside paths could be inundated 21 times a year. As a result, the paths were raised to reduce potential flood risk to just 4 times a year.

Michael Vaughan, lead Engineer at Atkins for the River Edges Engineering workstream for the London 2012 Games, commented "Flood Modeller Pro's 1D solver was vital in ensuring the safety of the Games and in ensuring a usable legacy".

Contact us

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With a legacy stretching back 40 years, Flood Modeller allows users to model rivers, floodplains and urban areas, using our powerful 1D and 2D solvers.