The towns of Maidenhead, Windsor and Eton and nearby villages have a long history of flooding by the River Thames. The last major flood occurred in 1947 but it was not until 1989 that a solution along the lines of the present scheme was agreed. It has become the largest fluvial flood relief scheme in Great Britain.

The scheme consists mainly of a new 11.6km flood relief channel, starting at Boulters Weir upstream, north of Maidenhead and rejoining the Thames downstream of Black Potts Viaduct, east of Windsor.

Nuttall was awarded Contract 9 by the Environment Agency in December 1998. It is a major part of the overall scheme and included the excavation of a trapezoidal channel that extends 9.2km between Dorney Bridge (carrying the Paddington - Bristol main railway line) in the west, to Black Potts in the east.

Along the route we constructed a variety of structures, service diversions and temporary road diversions. Among the structures were two channel control structures, seven road, access and bridleway bridges as well as six footbridges and a box culvert syphon.

Nuttall also undertook the design and construction of Dorney Bridge for the Environment Agency within the same scheme.
The new trapezoidal channel has a bottom width of approximately 30m and side slopes of 1 in 1½ up to 1 in 5, which, with its depth of 4m, gives a top width of 45m. The quantity of excavation, 2.6m cubic metres, meant that earth moving was one of the main elements of the contract. It was undertaken by 10 Moxy MT36 articulated 36 tonne capacity dumptrucks, four 360 degree excavators (two Komatsu PC340s and two Komatsu PC450s), two D65 Komatsu tilting blade bulldozers, a Caterpillar D8 bulldozer and a Caterpillar 14G grader.

An interesting aspect of the channel excavation was its control. Due to the height of the water table, the majority of the excavation was underwater. To aid accuracy, qualitative reporting and operator autonomy, Nuttall equipped two Komatsu PC450s with GPS-linked digging systems. Each PC450 had a radio linked GPS receiver on board. The equipment allowed the machines’ positions to be pinpointed to a theoretical accuracy of 20mm in plan and 10mm in elevation, anywhere on the site. Positional information was combined with machine attitude and digging angles to provide real-time animation via a cab mounted industrial PC. Frequently used in the dredging industry, this is believed to be the first successful utilisation of GPS-linked excavation monitoring for a land-based excavation.

Two of the structures, Pococks Lane and Slough Road bridges, were the subject of alternative designs proposed by Nuttall. In essence, both alternatives constituted continuous flight auger piled abutments and piers and deck construction before excavation.

Benefits were that the realignment of Pococks Lane was eased and land take was reduced and the noise associated with sheet piling was eliminated. In addition, the nuisance of heavy plant crossing existing roads did not arise, as access was available earlier by passing under the structures.

Delays due to unforeseen ground conditions were mitigated by constructing the centre piers of Pococks Lane bridge using diaphragm walling.

The effect of the scheme on the environment was of prime importance. The channel was routed to avoid sensitive areas and every opportunity was taken to enhance the environment and recreate wildlife habitats lost from the main river over the centuries. Water levels within the channel are regulated by the control structures to match existing average groundwater levels. Furthermore, Nuttall constructed 16km of footpaths throughout the scheme and extensive “wetland” areas.

That this environmental enhancement has been achieved successfully is demonstrated by the inspector who took the Public Enquiry, who stated in his report, “Furthermore, I find that the evidence strongly suggests that the scheme would be a uniquely attractive addition to the landscape between Maidenhead and Eton”. 