

Queen Mary and King George V Emergency Draw Down Schemes

BRYN PHILPOTT, Thames Water Utilities Ltd
YINKA OYEYEMI, Jacobs UK Ltd
JOHN SAWYER, Jacobs UK Ltd

SYNOPSIS.

Thames Water owns a large number of non-impounding reservoirs. These have unusually long embankments with narrow clay cores and gravel shoulders, which could be susceptible to piping failure and erosion. They are typically located in urban areas. Thames Water has therefore reviewed its policy regarding emergency drawdown capacity and started an improvement programme on the most critical reservoirs.

The Queen Mary and King George V reservoirs are two of these critical non-impounding reservoirs with continuous embankment lengths of 6.3km and 6.5km and storage volumes of 30 Mm³ and 12 Mm³ respectively. Following the statutory inspection of these reservoirs, a safety recommendation was made which required a significant increase to the existing emergency draw down capacity of each reservoir. This required Queen Mary reservoir to achieve 0.75 metre emergency draw down from top water level within 24hrs and King George V reservoir to achieve 1m draw down in 24hrs. Studies instigated as a result looked at various options of achieving the draw down with the final solution involving the design and construction of twin siphon pipes fitted with submerged discharge valves.

It is believed that a number of UK reservoirs may require additional emergency draw down capacity as measures in the interest of safety, as defined within the terms of the Reservoirs Act 1975, over the next few years. This paper looks at the options considered before arriving at the final solution. It also discusses challenges in the design and construction of the schemes.