



A465 Heads of the Valleys Carno Arch

South Wales

Client

Welsh Government

Contractor

Carillion

Consultant

Arup Atkins

Works Completed

2014



The Heads of Valleys Dualling project is one of the Welsh Government's key drivers for promoting social and economic regeneration in the area.

The new road crosses over the Carno valley on an embankment of earth, to maintain the flow of the existing spillway down the valley from the Carno reservoir, and to provide access to the Welsh Water treatment works an arch underpass was designed and supplied by Reinforced Earth Co. Ltd. (RECo).

The TechSpan® arch structure RECo provided has a span of 18m and a rise of 9.6m making it the largest TechSpan arch structure in the UK. The arch has more than 22m of backfill above the crown.

TechSpan is a two-pin precast concrete segmental arch system. The arch strength is developed by soil/structure interaction. The geometry of the arch and the large backfill made this a complex structure to design. The arch has a 1:20 longitudinal fall. This created a problem for erection stability, RECo designed and supplied special unit geometries to enable the units to be erected quickly and safely.

The arch portal units have traditionally been designed with a reinforced concrete collar beam, this can make the installation complex and involves substantial temporary works and working at height. To eliminate these hazards RECo designed the portal units as free standing cantilever structures with a small in situ joint.

The working area was restricted making storage on site a problem, RECo co-ordinated a just in time (JIT) delivery programme with the precast engineers, Macrete, to ensure materials were delivered in sequence to allow construction to proceed as planned.