



SPOTLIGHT ON

M1 RIVER TRENT VIADUCT

COLUMN STRENGTHENING

Following 12 months of early contractor involvement as part of the Area 7 framework for Highways England, VolkerLaser was awarded vital column strengthening works to the River Trent Viaduct on the M1.

The M1, Britain's first full length motorway, opened in 1959, allowing drivers to travel from London to Leeds. Midway along its 193 mile trajectory, the M1 is carried over the River Trent floodplain by a concrete viaduct. Built in 1964 and accommodating more than half a century's worth of commuters, the structural integrity of the viaduct required strengthening.

VolkerLaser began works in October 2016, carrying out extensive earthworks and watercourse diversions to establish safe access to the existing columns and associated foundation bases. This included necessary temporary works designs and ground-water control and filtration.

To prepare the 136 exposed concrete surfaces for repair, high pressured water jets were employed in the hydrodemolition of delaminated areas of concrete to an aggregate finish. To enhance the structural integrity of the column foundations, new starter reinforcement bars were resin fixed to the existing bases integrally. The subsequent process of in-situ dry sprayed concrete repair constructed reinforced foundation bases of superior diameter.

New shear reinforcement bars were fixed into the existing concrete columns, which were then re-profiled with custom made modular steel column shutters, acting as a mould in readiness for further in-situ concrete casting. Manufactured by Form-Fab Ltd, the innovative concept was devised by VolkerLaser. The modular system allowed the shutters to be fixed together in varying combinations to cover the vast range of column lengths required. This eliminated the expense in manufacturing tailored shutters for each individual column, providing the client with a value engineered solution, bringing the project well within budget.

With the work area prone to serious flooding of up to two metres in depth, VolkerLaser needed to remain in regular contact with the Environment Agency, monitoring heavy rainfall and flood warnings. Emergency evacuation procedures and contingency plans were required, as well as the need to keep the quantity of plant equipment on site to a minimum due to ground weight capacity.

Operations manager, Andy McGovern said: "This was an interesting but challenging scheme carried out within the River Trent floodplain. The VolkerLaser site team demonstrated excellent planning, innovation and risk management to deliver a first class job on time and within budget for Highways England."

VolkerLaser completed the works in October 2017, two weeks ahead of programme, with the teams innovative engineering solutions ensuring the long-lasting structural stability of a vital transport link.

£1.87 M
CONTRACT VALUE

52 WEEKS
PROJECT DURATION

136
COLUMNS AND BASES

900M³
IN SITU CONCRETE
CASTING



i COLUMN STRENGTHENING WORKS TO THE M1 RIVER TRENT VIADUCT.

