

How offline 'Mock ups' benefit Customer outcomes



PROJECT

Gade Valley Viaduct

CUSTOMER

Connect Plus M25

CONTRACT

10 Year Framework

Issue

With vehicle numbers increasing at 7% per annum, and the estimated cost of motorway lane closures at £50,000, undertaking essential improvements to the Strategic Road Network requires agile thinking for safe and predictable scheme delivery.

On the M25 at Gade Valley Viaduct, a 2 year programme of strengthening had to be undertaken to the 400m long box girder structure. The challenge was developing a repeatable technical solution that could be safely implemented without increasing journey times.

Solution

One answer was to test and refine the design 'offline' before applying it to the 'live' motorway environment. We did this by taking learning from 2 similar schemes on the M4 at Boston Manor and at Chiswick. There we had used off-line

prototyping in the form of trials on a replica 'mock up' section of the bridge in advance of construction. In both cases it had been extremely successful in verifying the design but also in proving methods and training specialist trades.

Applying this successful approach at Gade, we fabricated a full scale section of the box girder beneath the existing bridge. The strengthening required application of bolted plates and new welds. Working with the customer and designer COWI we were able to optimise the bolt installation and test the design. This led to improved efficiency, safety and importantly provided confidence in the solution before work commenced on the actual structure.

The 'mock up' then went on to become an invaluable asset during construction. It was used to verify the welding and check specialist's competencies. Incremental improvements in design and techniques were regularly tested prior to implementation. Safety training and even a full emergency rescue simulation were undertaken.

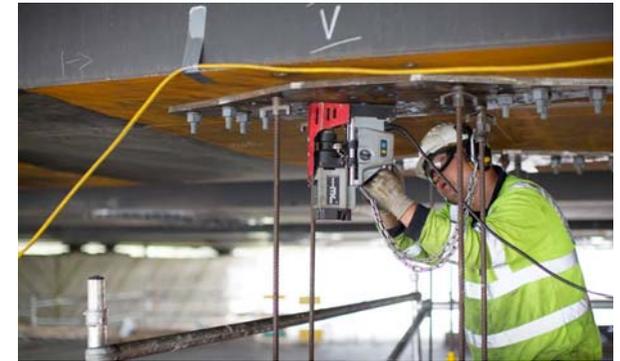


Figure 1 – Fixing plates on off-line 'mock up'

Outcome

On road/rail infrastructure works where it is mission critical to keep the public moving an offline prototype 'mock up' can play a vital role prior to undertaking work in the 'live' environment.

This upfront investment can be returned to customers through reduced safety risk, improved cost and time predictability, and reduced public disruption.

Importantly, the assurance in the performance of the design and the construction provides increased certainty for planning future network maintenance interventions.