



SPOTLIGHT ON

# KING GEORGE DOCKS

QUAYSIDE STRENGTHENING AND REPAIRS

Constructed in 1914, King George Docks resides in the Port of Hull, on the north bank of the Humber Estuary. With the Humber overseeing nearly one quarter of the UK's seaborne trade, and serving the whole of the British Isles, it is crucial that the structural integrity of the port is maintained.

VolkerLaser were awarded the North Quay project from Associated British Ports as a result of previous success in delivering strengthening and repair works to the Saltend Jetty in 2013.

North Quay is a 750m long suspended quayside, devised into a series of bays, upon which cranes are stationed in order to unload incoming shipments. The hostile nature of the coastal environment not only challenges the quayside's structural integrity, but also limits opportunities for safe access to areas in need of refurbishment.

Access to the quay was also restricted by tide times, port activity and weather conditions, which all cause the water levels within the dock to fluctuate. VolkerLaser collaborated with project engineers to design and manufacture innovative steel workboats, which could be adjusted to alter the height at which the boats would sit in the water.

With safe access obtained, the first major element of the works could be undertaken. High pressured water jets were employed in the hydrodemolition of existing delaminated concrete on the quayside beams and columns. Subsequently, any exposed link reinforcement bars (rebars), which were shown to be corroded or damaged, were replaced to reinstate the substructure strength. Approximately 10,800 galvanic anodes were then attached to the new and existing link rebars, in order to prevent any further corrosion.

The beams and columns were re-profiled with timber formwork, acting as a mould structure in readiness for the concrete repairs.

**£6.5 M**  
CONTRACT VALUE

**750 METRE**  
QUAYSIDE

**10,800**  
GALVANIC ANODES

**370M<sup>3</sup>**  
SIKA 133F

Approximately 370m<sup>3</sup> of Sika 133F spray applied concrete was utilised in order to achieve a superior level of structural integrity.

For the crane beams, where the structure was compromised, extensively due to the corrosion of the rebars, additional strengthening was required. VolkerLaser collaborated with design engineers Curtins, in developing a unique and innovative solution of applying carbon fibre Sika wrap to restore integrity to the beams. King George Docks marks the very first time carbon fibre wrapping has been successfully utilised for structural strengthening within a marine environment.

Subcontract site manager Andy Hart said: "as a construction project, the challenges accompanying the King George Docks quayside repairs are quite different from the norm." It is VolkerLaser's triumph in overcoming these unpredictable complexities which has reinforced confidence within the client relationship and provides further evidence of success in a growing marine portfolio.



**QUAYSIDE STRENGTHENING AND REPAIR WORKS AT KING GEORGE DOCKS, HULL.**

