



IN THIS ISSUE

LIFTING THE LID

What people really think about H&S

ANALYSIS

Addressing the offshore maintenance challenge

UPDATE

Preserving a cold war Icon

BACK TO THE FUTURE

Time, neglect and saltwater have all had their impact on the swing bridge at Folkestone harbour, but after extensive repair works it is now ready for use again, albeit as a pedestrian walkway across the inner harbour

The Victorian swing bridge at Folkestone harbour is a heavy, solid piece of traditional rail engineering, built around a central turntable to allow ships of any height into the port's central harbour.

In the town's heyday the bridge was at the last stop on English soil for passengers on the Venice-Simplon Orient Express, travelling in luxury from London's Paddington station to romantic Continental destinations. As time and the trains moved on, disuse and neglect were allowing the bridge to slowly rust away.

It has taken a huge effort but now, against all the odds, the bridge is about to re-emerge in full glory as the centrepiece of a major harbour front restoration project breathing fresh life into one of England's famous ports.

RESTORATION

The swing bridge restoration is one of the many measures now being taken to recognize the heritage of the former port area, with historic structures incorporated into the redevelopment

and multi-million pound investment from both public and private sources.

Time, neglect, salt-water and weather combined to make the restoration job a challenge. Decay on the two parts of the harbour crossing – a thirteen-arch brick viaduct and the steel swing-bridge – was so severe that repointing the brickwork and blastcleaning the steel took over 20,000 man hours. Despite the extent of work, the viaduct will be open to pedestrians later this year as further work on redevelopment continues.

NEW LIFE

Today's redevelopment of the sea front area includes plans for up to 1,000 homes, 10,000 sq metres of commercial premises and hundreds of jobs, with a £70M investment from Sir Roger De Haan, former owner of the Saga travel, publishing and financial services organization. The Regional Growth Fund has contributed another £5million towards essential and extraordinary infrastructure on the seafront, including new flood mitigation measures.

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FOCAL POINT

Rather than hide the down at heel rail bridge, planners decided to turn it into a focal point, repurposing it as a pedestrian walkway across the inner harbour.

Under main contractor Graham, the contract for renovation of the viaduct brickwork and swing-bridge went to London contractor Rhinoceros. The company specialises in highway structures maintenance, and has a reputation for difficult and dirty jobs that others are happy to leave alone.

HEAVY JOB

Duncan Maclean of Rhinoceros says: "The rail bridge will be another key element in improving the harbour and recognising its heritage, and we're very excited to be involved. Since the rail viaduct and bridge are visible from anywhere in the harbour they will be a unique and distinctive feature.

"A project like this is not for the faint-hearted. Decades of neglect and exposure to sea water had left the steel and brickwork in very poor condition, and blasting work had to be carried out with considerable care for the tidal environment."

Project manager William O'Hare says the repair and repointing of the brickwork has required 8500 bricklayer hours, with 5600 reclaimed bricks and 5050 new blue engineering bricks used.

WAFER-THIN

The underlying structure was solidly engineered but even so, after cleaning and blasting, it became apparent that some items such as the steel walkways beneath the rails would not withstand further work and would have to be replaced in many areas. In some cases blasting to the required SA2.5 profile left only wafer-thin fragments.

O'Hare says: "A local historian told us the bridge had not been maintained properly since the early 1960s. The environment is classed as C5, the same as offshore. The total number of steel repairs ended up being more than 400, and the pitting was so severe that blasting had to be done from all possible angles. We used over 165 tons of Scangrit copper slag medium abrasive, with the bridge fully encapsulated to protect the marine environment.

"Some areas were inaccessible, with barely room to move. As the tide would sometimes come right over the scaffold there were days when no blasting at all was possible, and other times when the grit couldn't be removed by our vacuum, only by hand.

"Over 12000 man hours have been expended on the swing bridge to date. Large quantities of rust and scale have been removed. We used an Edcar 22KW dust extraction and ventilation unit to control dust and provide a safe and comfortable environment for blast operatives. We also used a Sacvac vacuum recovery unit to extract spent abrasive from the bridge back to the quayside for removal and disposal."

Over 400 individual steel repairs were completed by a team of up to six welders from a local company, Cook Fabrications Ltd.

CAPSTAN

The swing bridge, which rotated around a central column, was installed in 1930 to a design

Right: Large quantities of rust and scale have been removed



Above: Over 400 individual steel repairs were completed by a team of up to six welders

by the chief engineer of the Sothorn Railway, George Ellison, OBE MICE. It has three main longitudinal girders and sits on a brick base with stone quoins. The base is original to an earlier 1893 bridge on the site, which itself replaced an even older swing bridge. When operational, the bridge was swung open by means of an electric capstan on the wharf and a rope, with lifting and locking mechanisms hand operated.

DIFFICULT ACCESS

The swing mechanism itself had not been used for many years, and it is not feasible to bring it back to use. Its purpose had been to allow taller ships in and out of the inner harbour, but only at high tide.

O'Hare continues; "Difficult access and the need to keep a channel open for boats has complicated restoration of the viaduct.

Underneath the bridge, heavy scale was discovered which had to be removed using hand/mechanical tools before we could proceed with blasting to provide the specified profile. The initial choice of coatings also had to be changed after paint inspectors discovered long-term effects of water ingress, and the volume of heavy scale to be removed only became apparent after initial cleaning."

The bridge coatings, supplied by PPG, include over 1200 litres of Sigmacover 690 Aluminium Primer and approximately 1400 litres of Sigmashield 880 epoxy intermediate coat - formulated to cure under, and withstand immersion in, seawater.

The finish colour is Sigmadur 550 two pack polyurethane, BS381C 226 Mid Brunswick Green - providing high UV protection and allowing the bridge to keep its new colour well into the future.

MURDER

In the glory years, Agatha Christie is thought to have written *Murder on the Orient Express* in Folkestone's nearby Grand Hotel. In an echo of the book's plot, the bridge's decline could not be blamed on any single murderer - probably they all did it. Rail links were officially closed in 2014, and in 2016 Network Rail handed back its lease. Until then, maintenance was the responsibility of successive railway companies. Gradual loss of rail traffic to other ports culminated with the end of the last regular train passenger service seventeen years ago, as the port's purpose was finally usurped by the Channel Tunnel. As an iconic heritage restoration though, the bridge will now live on. ■