

Devonport and Caroline St Bridge replacements by Volker Fitzpatrick

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Two life-expired underbridges in central London have been removed and replaced to help create a more enjoyable, smoother and reliable service for passengers on the Fenchurch Street to Shoeburyness railway line.

The Caroline Street bridge and Devonport Street bridge in Limehouse were both over 100 years old and in need of full deck renewals. Due to the complexity of the work and the size of the combined work site (with another track renewal project), Network Rail deemed this route possession as one of the nation's top five high risk projects.

Working collaboratively with Network Rail and Docklands Light Railway, VolkerFitzpatrick developed a detailed plan and further carefully considered contingency plans to ensure both bridges could be successfully reconstructed – concurrently – during a 98 hour blockade over the Easter Bank holiday weekend.

Caroline Street bridge

To replace the Caroline Street bridge, the two existing metal decks carrying the up and down lines were removed and replaced with one

composite concrete deck, chosen for ease of installation and to help reduce the noise emanating for local residents. The new deck was built in advance of the main possession and incorporated eight prestressed concrete beams with an in-situ high strength concrete stitch. The ballast, sleepers and rails were all pre-loaded onto the deck in advance, de-risking installation during the possession.

Devonport Street bridge

A more complex replacement, the Devonport Street bridge needed both the metal deck, which carried the down line, and an existing girder supporting the cross beams on the up line removed. Significant temporary works to support both the dead weight of the bridge deck and also the live load from trains and on track plant were completed prior to the installation of the new girder. To install the new U-deck, the existing brick abutments were partially demolished and new precast concrete cill beams and ballast walls were installed, which was completed using a 150 tonne mobile crane lift set up within the road closure.

To replace both bridges, several full road closures and significant traffic diversions were needed to transport the new bridges, under police escort, from the site compound on Self Propelled Modular Transporters (SPMTs) partly along the busy A13 highway.

Commenting on the project, Mark Taylor, contracts manager, said: "The completion of this blockade is an amazing achievement by the team. With numerous other stakeholders involved, the team had to interface extremely closely with all parties; with constant communication and liaison throughout. We would also like to thank local residents who were very understanding of the closures within the area whilst these complex bridge replacements took place."

Meliha Duymaz, Network Rail's route managing director for Anglia, said: "Anglia's Team Orange worked incredibly hard to maintain and upgrade the railway, helping us to deliver more reliable services to passengers and freight users. We know there is never a good time to close the railway, so I want to offer my thanks to passengers and our lineside neighbours for their continued understanding while this much needed work was carried out."