

Fenchurch Street Rail Station, London, UK



Cantilever Signal System



Viaduct

Fenchurch Street Station is one of London's busiest rail stations; it is the start point and terminus for the main tracks from the South of the U.K. to London. The construction itself is a remarkable example of Victorian 'railway' Architecture and was built at the height of rail travel era. The tracks carrying the service to the station travel over a Victorian Viaduct, comprising a series of arches. These arches support the cantilever system of signalling that guide trains to and from the station. The structure is a large steel gallows extending out over the track, with the signalling system suspended from it. The engineer had to recognise that any work on the structure had to address the problem of a live track running overhead.

The Problem

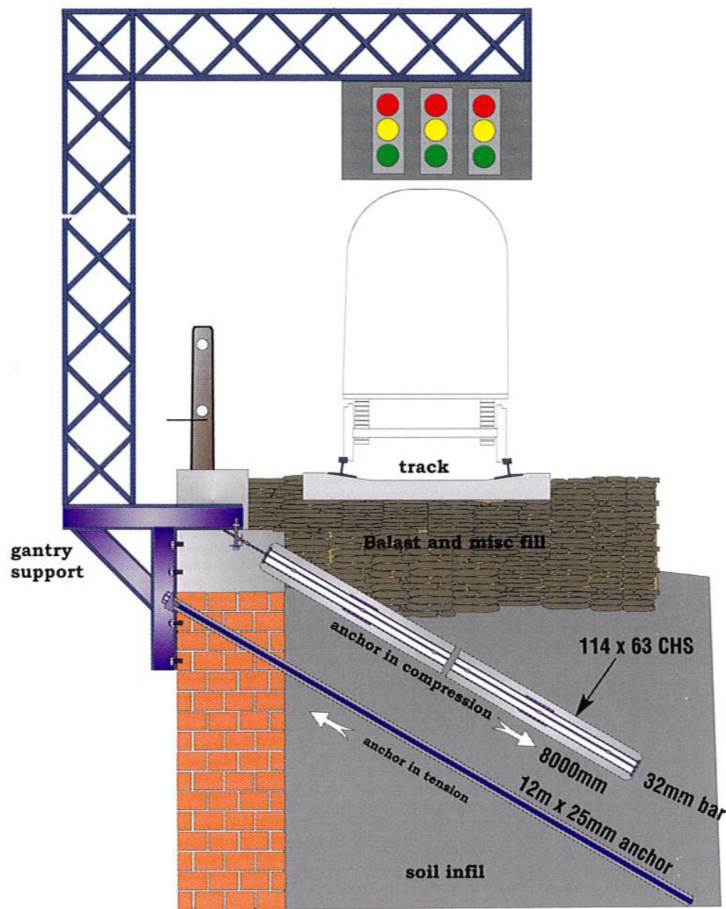
A system was required to secure the gallows to the bridge arches; in their preliminary planning, Railtrack anticipated a shut down of the tracks for 6 weeks. Such a closure would mean a chaotic time table, irate passengers and a loss of revenue. The CINTEC Anchoring System proposal provided a solution that would require only 2 days of rail shut down.



The assembling and installation of a compression anchor



The torquing of the anchors



FOUNDATION DETAILS OF ANCHOR ARRANGEMENT TO SIGNAL CANTILEVER FOR BRITISH RAILWAYS AT FENCHURCH STREET STATION LONDON

The Solution

The proposed solution involved three CINTEC Anchor types. The central one was a compression anchor of stainless steel comprising a 32mm shell rebar inside a 114 x 6.3 CHS installed in a 200mm hole, 8000mm deep, at an angle of 30 degrees to the horizontal. Below it was a tension anchor, comprising a solid stainless steel body, 12m x 25mm installed in a 50mm drilled hole, and attached to the gantry support to prevent any rotation. Two smaller shear anchors 20mm x 800mm were similarly installed to complete the support. Load tests were carried out, with the placing of a 20m steel beam in position.

As a result of the use of a CINTEC installation, disruption was reduced from 6 weeks to 2 days together with a 50% saving on the original budget Railtrack had allocated to the project.



Shear anchors shown at the top and tension anchors at the bottom

Testing



In shear



In tension

