

BISHOPSGATE GOODS YARD

LONDON



FEASIBILITY STUDY TO INVESTIGATE STRENGTHENING OPTIONS

Frankham Consultancy Group were appointed to investigate outline strengthening options for mitigating the deteriorating condition of a brickwork Jack Arch deck at Bishopsgate Goods Yard.

The viaduct decks, constructed circa 1880, comprises a 2-level corridor spanning the Up and Down Suburban lines between Liverpool Street Station and Bethnal Green Station. Part of the structure is Grade 2 listed.

The decks comprise longitudinal and transverse wrought iron rivetted plate girders, with brickwork jack arches spanning between the transverse girders, which span between the longitudinal girders that bear on to engineering brickwork piers.

The site is currently in the planning stages of being developed for new private accommodation, retail units and public open spaces. This development will retain the existing structure but install a new encapsulating structure to transfer all superimposed loading off the deck under consideration.

The in-house activities undertaken by Frankham for the study comprised:

- A condition survey of wrought iron girders.
- Paint analysis to test for lead on the wrought iron girders.
- A topographical survey of the structure, at the mid and upper level.
- A Hidden Critical Element examination of the wrought iron girder webs hidden by the brickwork jack arches, including use of an ultrasonic thickness gauge.
- Outline strengthening options for temporary supports to the girders.

As part of the initial study, Frankham undertook a detailed desk study and site visit to identify the constraints that may influence or affect the strengthening designs, including details review of the previous structural assessment report.

To further add value, 3D images were produced and presented to the client and the developers engineer so that concept could be agreed prior to the more detailed work.

Information collected from the surveys and investigations guided the outline design proposals for the strengthening support works. Several options were identified as potential solutions, which included a mixture of new girders, support brackets and columns depending on defects and constraints present. Each option was appraised and a method on construction provided, with the preferred design recommended.

The paint analysis undertaken identified a high content of lead present. Frankham provided guidance and recommendations for the controls and safe systems of work to be implemented to ensure lead exposure is minimised for the duration of the works.

Client:
Network Rail

Sector:
Rail

Services:
Civil Engineering



Fig. 1: Aerial elevation of Bishopsgate Goods Yard, London Road Structure (image from Google).

Fig. 2: Support bracket strengthening options.

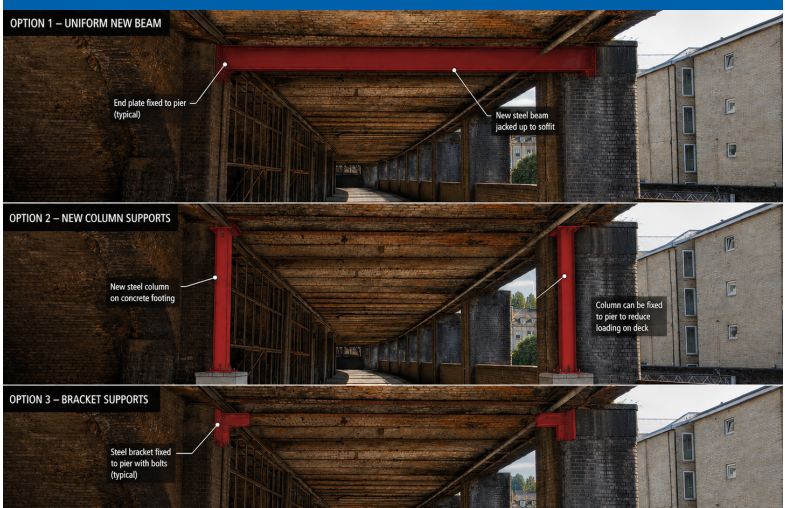


Fig. 3: View down deck level of viaduct.



Fig. 4: Some of the site constraints identified that would influence the strengthening works

