

# Fratton Station, Portsmouth



Frankham were appointed to inspect and identify structural elements, and to design remedial works, to the canopies at Fratton Station.

Fratton Station, located in Portsmouth, has three platforms covered by two canopies. The station was first opened on 1st July 1885 and given that the canopy structure features cast iron and is Victorian in appearance, the canopies are believed to be part of the original station structure.

Services provided by Frankham on this project included:

- A desktop site reconnaissance via satellite images.
- Site inspection, measurements and comprehensive sketches demonstrating the canopy roof structure and load paths.
- Canopy gauging survey and analysis.
- Design of permanent remedial and temporary works.
- Construction methodology, sequencing of repairs and maintenance of stability throughout.
- Structural design report and detailed drawings.

Areas of the canopies identified for targeted maintenance and repair were:

1. A splice connection to the timber column on Platform 2.
2. To revise the pipe support detail by relieving loads from a deflected beam on Platform 3.
3. Reinstatement of a cracked cast iron bracket to the deflected beam on Platform 3.

## Client

Octavius Infrastructure Ltd

## Services

Infrastructure Engineering

## Sector

Rail

## Value

£27.2k

## Duration

Feb 2023 - Apr 2023

## Challenges Overcome

### Lack of technical data

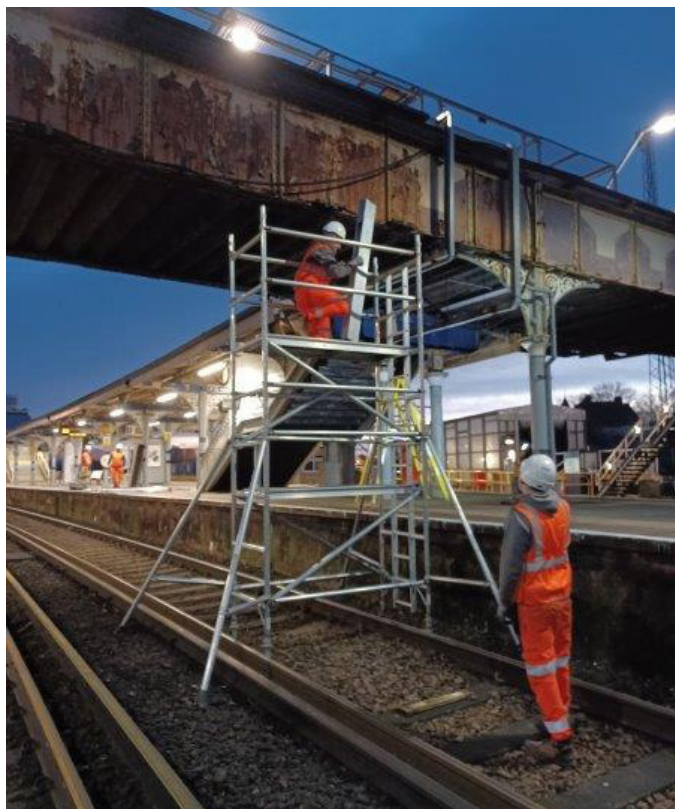
A potential risk was the limited record drawings and data, and that no information was available on the condition of the structure. It was important for us to be cognisant of the load capacities and potential deformation of elements when changing load paths when load is transferred to the temporary works and then back again. Also, after the repair of the column base and the reinstatement of the repaired, previously cracked bracket.

**Solution:** Frankham have professionally trained engineers who, through tactile and visual inspections, ascertained the construction and structural arrangement of the Victorian canopies at Fratton Station. Our engineers took measurements and produced sketches that enabled them to carry out the necessary calculations to provide a solution to the deteriorated areas of the canopy structure without compromising the rest of the structure.

### Ensuring the adequacy of temporary works

Temporary works were required to ensure the structural stability of both canopies during the execution of the remedial works.

**Solution:** Calculations were undertaken to demonstrate the adequacy of the proposed remedial works and the selected temporary works. Load transfer in the required structural members was calculated using measurements taken on-site and published data for construction materials.



### Working in an operational rail environment

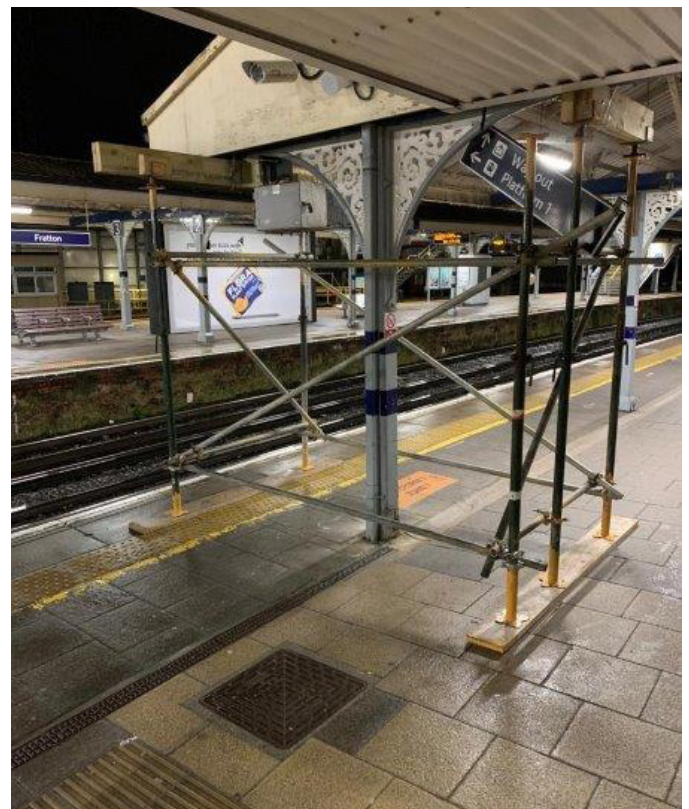
There were restrictions on working hours and areas during the site inspection, the installation of the temporary works and whilst carrying out the remedial works. These were in place to prevent disrupting normal station operation such as train operations, live services and the travelling public.

**Solution:** The inspection was carried out during night hours under line blocks by appropriately trained and protected engineers wearing prescribed Personal Protective Equipment (PPE). *Cont.*

Our design selection of the required temporary works and repair methodology, took into consideration the existing services and maintaining normal station operations. It also incorporated the specialist repair required for the cast iron bracket.

In order not to interfere with the station activities and travelling public in the construction sequence, the larger, temporary propping system could be dismantled once the cracked cast iron bracket was removed. A temporary steel bracket was installed to support the cantilever timber beam. The specialist nature of the repair of the cast iron bracket meant it needed to be sent off-site and it would be several months before it could be re-instated.

A two stage approach to the temporary works meant that the larger, more obstructive propping system was only in place for short periods. This effectively minimised impact on platform use and operations.



## Innovation

In the absence of record data, information was mined from available satellite imagery, to inform the engineers of the general layout of the canopies and their relation to the operating rail environment. This was useful for planning the inspection works and the Designer's Risk Assessment ahead of attending site.

## Sustainability

Retrofitting of the defective timber column and cracked, cast iron bracket in the Fratton Station canopies, delivers a sustainable solution. Maintaining the ongoing structural performance and lifespan of the station canopies is a less wasteful and low carbon solution compared with replacement with new structural members.

This project is part of a programme of maintenance and engineering works, managed by Network Rail, that utilises the £4.8 billion Levelling Up Fund launched by the UK government.

Investing in infrastructure will improve everyday life for communities across the UK, including the upgrade of local transport.



## Knowledge Sharing & Continuous Improvement

Frankham have maintained open, clear and professional communications with Octavius representatives and involved subcontractors throughout the works from inspection to issue of deliverable. This has been achieved through the use of video calls, voice calls and emails.

The Frankham Rail Team has learning processes embedded that promote continuous improvement from one inspection and project to another.

Works are planned and managed with constant efficacy and safety of the Team, with suitable equipment, designing software and with appropriate training and prescribed PPE.