



CP6 Buildings & Canopy Refurbishment Framework

A five-year plan was devised to strengthen and renovate station structures in the Sussex and Kent regions. Frankham Consultancy Group provided civil engineering design assurance services for the implementation of over 30 refurbishment and strengthening projects of station buildings and canopies.

Client:
BAM Nuttall

Services:
Structural and measured surveys
Survey specifications
Feasibility studies and optioneering
Structural assessment
Detailed design (inc. repairs and strengthening)
Temporary works design
CAT1 and CAT2 checks
Design assurance: Form A/B/G
Engineering assurance: CRE-D competency

Start and End Dates:
2019 - 2024

Overview

Canopy refurbishment works include replacing roof sheeting and glazing, upgrading gutters and downpipes, replacing valance and fascia boards, modifying them to accommodate new gauge clearances, installing maintenance fall arrest systems, and conducting a comprehensive reassessment for new rodding eye points in cast iron columns.

Our involvement in station building restorations such as Peckham Rye, which is a listed building, includes the preparation of design specifications, condition surveys, structural capacity verification, design of new aluminium roof cresting and brickwork repairs.

Frankham provided the following services:

- Inspection: Conducting structural condition, dimensional, and photographic surveys, including investigation of Hidden Critical Elements (HCEs)
- Survey specifications: Preparation of topographical and geotechnical specifications for use by third parties
- Structural assessment: Review of OPSAP reports and conducting targeted re-assessments
- Feasibility studies: Optioneering and modelling of structure alterations to aid client decision making process.
- Design assurance: Form A/B/G for approval
- Engineering assurance: CRE competency for Permanent Design and Temporary Works

Methodology, Delivery & Communication

This project included the delivery of Form A, B and G assurance forms, arranging site attendance and inspections with the contractor, providing work package plans for our tasks and the design and specification of repair and strengthening works. To ensure good planning, project governance and programme management, we used matrix management to ensure resources were assigned specific roles and taken out of line management complications.

The framework was assigned a Project Director, an Engineering Project Manager, and a Design Manager. The roles here were clear in that they all managed and had responsibilities for the delivery of the work in specific and manageable activities. The Project Director had overall responsibility for ensuring the procedures, process and the projects were set up correctly and that the team was provided with the resources they needed to undertake the work. The Project Director was also acting as the lead in terms of client satisfaction and safety assurance and was responsible for the overall governance of the work. The Engineering Project Manager ensured that the programme was developed, the resources were assigned, and the brief was clear to all staff in the project team. Part of their responsibility was also to prepare the Work Package Plan Input and Task Briefing Sheets for incorporation into the contractors Work Package Plan. The Engineering Project Manager was also responsible for the programme and the day-to-day commercial aspects of the project.

The Design Manger was responsible for the technical content of the work including any calculations, drawings, and reports. They provided technical input to the team

and ensured the site work was correctly executed and captured, and that the design feasibility and development was discussed and developed with the whole team. This resulted in a robust and comprehensive output for the work.

At project start up a clear brief was developed in conjunction with the clients remit and an initial meeting undertaken to discuss the delivery plan to ensure all requirements were captured before the work started. We then planned and programmed the work in conjunction with the contractor's planners so that the work was resourced and managed appropriately. The delivery stages were clearly identified, and specialist sub-contract/supply chain were booked in to undertake their activities.

Prior to going out to site, the teams were briefed. We also assigned an on-call manager, who was not on the shift, but there to assist the staff and deal with any emergency situations or changes that may be required to the agreed working method. If anything was identified on the night that needed raising to Network Rail, it was raised to the COSS and dealt with in accordance with Handbook 6 for the Examination of Structures. We then would either issue an email, an Urgent Defect Report (UDR) or a Preliminary Advice Notice (PAN). In accordance with the Network Rail procedures agreed for the project.

On a programme of this size, weekly design review meetings were held internally and daily updates reviewed on each task being undertaken. The output of this was assessed against the programme and guidance then given/taken on any technical aspects.



Eastbourne Station Refurbishment



The objective of this scheme was to refurbish the Trainshed roof at Eastbourne station. Eastbourne station is located in East Sussex. It was originally built in the 19th century and is classified as a Grade II listed building.

Over the years, the station has undergone several renovations and upgrades. As part of this scheme, a tactile survey of the canopy was carried out to identify all repairs necessary to maintain the structural integrity to the next maintenance period of 15 years. Inspections were carried out with use of Mobile Elevated Working Platforms (MEWPs), with all engineers qualified in IPAF harness training.

Frankham provided several services for these works, including:

- Optioneering for strengthening of overall structure
- Targeted structural assessment
- Repair detailing of defective columns
- Materials testing
- Monitoring regime
- Staged construction sequence
- Replacement of the felted roof areas with the specification of new EPDM.
- Design and specification of new box gutters, downpipes with rodding eye access points for more effective maintenance
- New valance and fascia boards in GRP, to resemble the existing timber appearance

The Sussex Route Director for Network Rail, praised the work:

“The quality of work on site is being completed to a very high standard and we’re taking great care to restore the Grade II listed building to its former glory.”

Challenges & Innovation

As the structure is a Grade II listed building, there were challenges using different materials without changing the aesthetics of the structure or detracting from its character. Replacement of glazing was a big aspect which we proposed to remedy with the use of solid obscure polycarbonate glazing system that is hard wearing, sustainable and modern without losing the period look.

As part of the renovation, and to make future maintenance safer, Frankham proposed to the client to install roof hatches to allow safe access for all maintenance activities to be undertaken from the underside, instead of requiring personnel to walk on top of the roof.

Peckham Rye Station Building Restoration



Built in 1865, Peckham Rye station has undergone a renovation to restore its features to its original Victorian presentation, and to prepare for future capacity and accessibility works to take place. Peckham Rye is the busiest interchange station in the entire country and, as part of the refurbishment, it has had its Victorian stonework restored as well as all of its lost ironwork reinstated.

Frankham were pivotal in providing engineering support to help with the renovation, and were involved in:

- The design specification requirements
- Inspection of the condition of the roof structural elements and assessment of its structural capacity
- Design of the replacement of the wing roofs
- Design of the new aluminium roof cresting
- Repair of the external brickwork and decorative concrete ledges
- Assessment of the structure for temporary scaffolding loading to enable the works to be completed

The works were part of a larger scheme to prepare the station for a planned major change internally to massively increase capacity at this overcrowded station.



Shoreham-by-Sea station Canopy Refurbishment

Major renovation and enhancement efforts have been completed out at Shoreham-by-Sea to enhance the station's facilities for passengers whilst contributing positively to the environment.

Shoreham-by-Sea station holds a historical significance as one of the earliest stations inaugurated in the southern region of England, commencing operations in 1840. It serves the coastal town of West Sussex and Shoreham Airport.

During the station's upgrade, a trial employing HVO fuel has led to a notable 37% reduction of carbon emissions on-site. HVO, or Hydrotreated Vegetable Oil, represents an innovative renewable fuel derived from existing bio-waste sources such as discarded cooking oil, plant waste, and organic materials. Despite its higher cost compared to traditional red diesel, HVO significantly diminishes net CO2 greenhouse gas emissions by up to 90%.

The works undertaken at Shoreham-by-Sea include:

- Replacement of roof sheets on both platforms to keep passengers dry
- Replacement of gutters and downpipes which will reduce the risk of flooding
- Timber valance board replacement to protect the canopy roof
- Replacement of fascia boards which stop water from penetrating the roof

- Prep and painting of canopy metalwork and timberwork to protect the structure
- Repair and strengthening of defective structural elements

The use of low maintenance materials such as GRP helped ensure that there is a maintenance free design life of a minimum 15 years for the structures.



The project was commended by the Sussex Route Director for Network Rail, who said:

"This upgrade has made a big difference to Shoreham-by-Sea station by improving the experience for passengers. These improvements are a vital aspect of our work to provide a safe, reliable and efficient railway."

"Shoreham-by-Sea was also the first project in Sussex to use recycled cooking oil instead of diesel fuel, allowing engineers to reduce the amount of carbon produced at the site by 37%. These actions help Network Rail work towards its goal of Net Zero Carbon Emissions by 2050."

