

Maidenhead Station Capacity Upgrade



Frankham was appointed to deliver Civil and Structural design services for a transformative upgrade at Maidenhead Station.

Situated in the Royal Borough of Windsor and Maidenhead, Maidenhead Station is a critical hub on the Great Western Main Line and a key interchange for the Elizabeth Line.

With over 3.2 million journeys annually, the station had long faced challenges of congestion and ageing infrastructure. The strategic upgrade aimed to resolve these issues by improving accessibility, enhancing safety, and optimising passenger flow.

Client

Morgan Sindall Construction & Infrastructure Ltd

Sector

Rail

Services

- Condition surveys
- Structural design of new staircase and lift shaft
- Canopy modifications and integration
- Form A and Form B submissions
- Designer's Risk Assessments (DRAs)
- Temporary works and geotechnical designs
- Reinforced concrete and steelwork designs
- Fixing and masonry detailing
- Drainage design
- CAD modelling and design coordination



Overview

Platform 2/3, an island platform serving the busiest part of the station, was accessible only via a single staircase and an outdated lift. This limited configuration led to severe bottlenecks, particularly during peak hours, resulting in overcrowding on the platform and within the connecting subway.

Network Rail recognised the need for targeted interventions and commissioned a major upgrade project spanning from late 2023 to autumn 2024. The initiative involved the demolition of the old lift, construction of a new lift and staircase, alterations to canopy structures, installation of a fatality mitigation fence, and enhancements to passenger-facing systems.

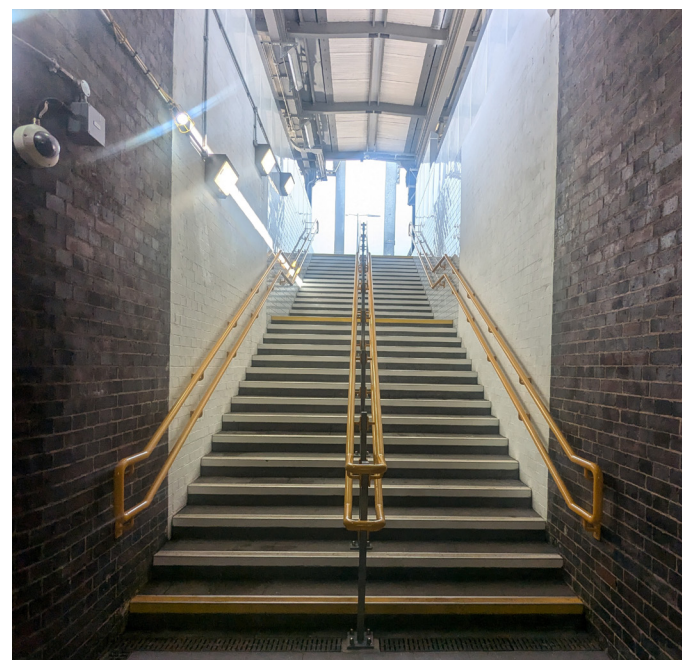
Condition Survey: Informing Targeted Upgrades

Before the commencement of the design, Frankham undertook a meticulous condition survey of the station's critical infrastructure.

Particular attention was given to the masonry walls of the subway, existing lift shaft structures, platform surfacing, canopy columns and roofing, and subway ceiling and wall finishes. The findings helped identify suitable areas for new interventions, especially the lift opening location and staircase tie-in points, and informed necessary remedial works to maintain structural continuity.

Objectives

- Provide modern, step-free access to Platform 2/3
- Improve pedestrian circulation and reduce congestion with an additional staircase
- Replace the ageing lift structure with a compliant and reliable new unit
- Deliver the works safely within a live railway environment
- Minimise disruption to passengers and maintain station operations throughout construction



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We are pleased to have delivered these upgrades, improving accessibility and safe use of Maidenhead station. Thank you to all involved, including our site team and delivery partners, who worked tirelessly to minimise disruption.

Olivia Perkins, Managing Director for Rail, Morgan Sindall Infrastructure

We're delighted to officially reopen these facilities, and the major improvements provide a more accessible, safer station environment for all who use it.

Rachel Geliamassi, Customer Services Director, GWR

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Staircase Design: Enhancing Capacity and Circulation

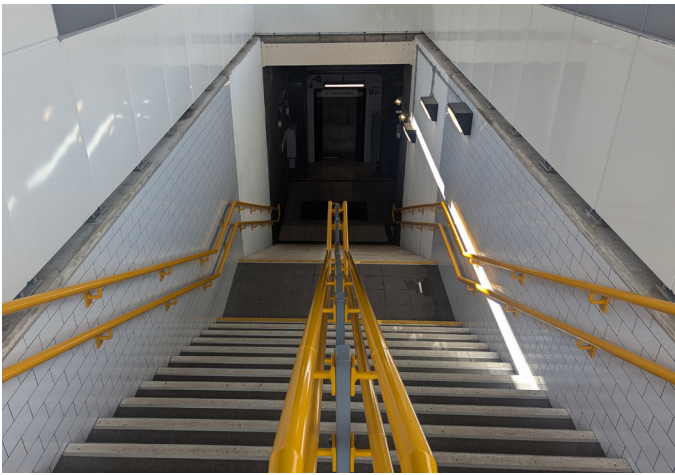
The new staircase was the flagship solution to improve circulation on Platform 2/3.

Excavations were carried out to create the platform opening, integrating the staircase into the existing footprint with minimal disruption. The staircase was constructed using cast-in-situ reinforced concrete, featuring upper and lower flights, an intermediate landing, and GRP stair tread covers. The design re-used elements of the demolished lift walls, maintaining platform integrity while minimising material waste.

Temporary works were devised to support each construction stage using modular formwork and props spanning the excavation. Geotechnical analysis underpinned the excavation sequencing, ensuring no undue impact on adjacent canopy column foundations.

Key technical highlights:

- Integration of side and end lift walls into the new stair design
- Coordination with architectural teams to ensure protection from water ingress by tucking the stair under the canopy.
- Installation of compliant balustrades and handrails seamlessly integrated into the fatality fence.
- Reinforced concrete walls and slab design to align with existing infrastructure.
- Sequential casting in three phases to ensure excavation stability.



Lift Design: Integrating Within Constrained Space

The new lift presented both spatial and technical challenges. Working within tight site constraints, Frankham delivered a dual-section lift shaft solution:

Below Platform:

- Existing concrete subway walls were repurposed to support the lift structure
- A reinforced concrete lift pit was cast beneath the subway floor, framed by two new brick walls
- A concrete substructure bridged the gap between troughing level and platform, avoiding impacts to the subway ceiling

Above Platform:

- New blockwork walls with brick facing were constructed above the substructure
- Concrete inserts were included to allow for future lift guide rail fixings
- A lift machine room was discreetly positioned at subway level, maintaining accessibility without compromising platform space

Value was added through early-stage client engagement using 3D models, which helped visualise spatial challenges and resolve lift placement within canopy constraints. The lifting beam design was carefully tailored to avoid dismantling canopy sections, using reduced web steel sections and installing from beneath the canopy to optimise clearance.





Fatality Fence: Safety Meets Subtlety

The platform-facing edge received a new fatality mitigation fence, extending the full length of Platform 2/3.

Designed to improve safety while avoiding numerous buried services, the fence introduced a protective barrier between passengers and fast-moving trains without undermining existing structures. Modular prefabricated elements were employed to reduce time on site and simplify installation.

Methodology and Delivery

The project was delivered in carefully planned phases:

- **Demolition:** Removal of the existing lift superstructure and platform canopy elements
- **Foundation Construction:** Sequential excavation and casting of lift pit and staircase bases
- **Superstructure Works:** Erection of lift shaft, staircase, balustrades, and canopy closure
- **MEP and Fit-out:** Integration of lift systems, lighting, CCTV, and PA systems
- **Platform Finishes:** Restoration of surfacing, tactile paving, and drainage

Critical works requiring trackside access or craning operations were scheduled during railway possessions, typically overnight or during off-peak times. Public safety remained a priority, with hoardings, signage, and controlled access throughout the site.

Sustainability and Community Impact

More than 150 tonnes of spoil were excavated and reused within the station footprint. Timber salvaged from the old lift structure was donated to Braywick Plant Nurseries, supporting employment and training for people with disabilities. These sustainable practices reflected our commitment to social value alongside engineering excellence.

Temporary Works and Innovation

Wherever possible, Frankham standardised reinforcement arrangements and detailing across the staircase and lift shaft.

Temporary excavation support, embedded fixings for canopy closures, and modular steel frames for rapid assembly were adopted to reduce complexity. Site Interface Plans, Inspection Test Plans, and Design Risk Assessments were produced and approved to ensure buildability, compliance, and safety.

