

AWARD

Fortnum & Mason Double Helix, London

PROJECT TEAM

Architect: Ben Pentreath Ltd

Structural Engineer:
Format Engineers Ltd and Ramboll

Main Contractor: Portview Fit-Out Ltd

Client: Fortnum & Mason



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Located at the centre of Fortnum & Mason's flagship store at 181 Piccadilly, the Double Helix Staircase forms a new circulation route connecting the retail floors while providing a distinctive architectural focal point within the refurbished interior. One of only a small number of double-helix staircases worldwide, it combines advanced structural engineering and digital modelling with traditional materials, bespoke detailing and refined craftsmanship.

The staircase comprises two intertwined flights arranged around the same central opening. Translating this ambitious concept into a structurally workable solution required its geometry, proportions and visual symmetry to be maintained while creating a structure capable of spanning considerable distances within the new atrium.

Structural steelwork was fundamental to achieving the slender appearance and complex geometry. Its strength and adaptability allowed the stair elements to remain visually light while providing the required structural performance. Curved steel stringers form the primary structure and establish the continuous double-helix geometry, while the completed staircase brings together timber treads, GRG soffits, hand-forged balustrade panels and bespoke brass fittings inspired by Fortnum & Mason's tea leaves.

The original structural concept relied on sections of the staircase being partially hung. During detailed design, an alternative clear-spanning solution was developed, simplifying its structural behaviour and improving its visual clarity. This contractor-led development represented a significant change to the original concept, producing a more efficient and buildable structure while preserving the architectural intent.

The long spans and slender elements required advanced digital analysis and optimisation to demonstrate the necessary strength and stiffness. The design also had to account for forces transferred into the existing building and the interaction between movement in the staircase and the surrounding structure. Resolving these considerations without introducing visually intrusive supports was central to the finished result.

The continuous geometry placed particularly high demands on fabrication. The curved steel stringers and bespoke components were manufactured to tight tolerances so that the two flights followed their intended paths and remained visually balanced. Any variation in the primary steelwork could have affected the alignment of the timber, balustrades, soffits and decorative finishes.

Three-dimensional scanning and advanced surveying techniques supported fabrication and installation. Accurate information about the existing building and developing structure allowed the steelwork and finishes to be coordinated before assembly. This helped ensure the timber treads, GRG soffits, balustrades and brass details fitted correctly, protecting the quality of the staircase and the wider refurbishment programme.

The staircase was delivered as an integrated package, requiring close coordination between the structural steelwork and architectural finishes. Transitions between the stained quarter-sawn oak, hand-forged metalwork, brass fittings and GRG soffits were carefully developed so the completed staircase reads as one coherent element. Contemporary modelling, surveying and fabrication methods were combined with materials and craftsmanship that complement the store's historic character. The steel structure is largely concealed, allowing the finishes and flowing form to define its appearance.

Installing the structure presented challenges comparable to its design and fabrication. The store remained operational throughout the works, requiring construction activity to be managed to minimise disruption to customers and retail operations. Much of the installation was undertaken outside trading hours, with strict controls on noise and other activities while the store was open.

The Piccadilly location created further logistical constraints. Deliveries were made during limited road-closure windows, after which every component was distributed internally through the historic building. Access was restricted to an opening approximately 1,500mm wide and 2m high, limiting the size of individual elements and influencing how the staircase was divided for transportation and assembly.

Bespoke lifting frames and internal gantries were designed to move and install the steelwork safely within the restricted building. The installation sequence was coordinated with the timber, balustrades, soffits and decorative finishes to maintain progress and avoid damage to completed work. These arrangements had to operate without the access or large-scale lifting equipment normally available on a new-build project. Careful sequencing was essential throughout, as each steel element had to be manoeuvred through the store, lifted into position and connected within the confined atrium before the architectural finishes could be completed.

Despite these constraints, the staircase was successfully installed within the live retail environment and has created a prominent new route through the store. By making movement between floors more visible and inviting, it has increased footfall to the upper levels while providing customers with a memorable architectural experience.

The Fortnum & Mason Double Helix demonstrates how structural steelwork can enable an ambitious architectural concept while remaining largely hidden within the finished feature. Advanced analysis, precision fabrication and carefully planned installation were combined with traditional craftsmanship to resolve the complex geometry. The steel structure and architectural finishes form a refined and coherent whole, while the new circulation route provides a practical commercial benefit. The result is both a technically accomplished structure and a distinctive addition to one of London's best-known retail interiors.



JUDGES' COMMENT

This three-storey double-helix staircase is a joy! It combines modern analysis and fabrication techniques for the hidden steel with immaculate craftsmanship for the finishes. The construction challenge was significant, working in a live shop but minimising any impact on customers.

The delighted client confirmed the intervention's commercial success, increasing footfall to upper levels while creating a beautiful and memorable architectural feature.

