

PROJECT OF THE YEAR AND AWARD

Manchester Airport Terminal 2 Reconfiguration

PROJECT TEAM

Architect: Pascall + Watson

Structural Engineer: Buro Happold

Steelwork Contractor: Leach Structural Steelwork Ltd

Main Superstructure Contractor: McCrory Holdings

Client: Manchester Airport Group



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Manchester Airport Terminal 2 Reconfiguration has transformed a 30-year-old terminal into a modern passenger facility while the international airport remained fully operational. The project upgraded the departures, security and arrivals areas within the existing four-storey building, forming the second phase of a decade-long transformation programme designed to improve the terminal's functionality and passenger experience.

Covering 71,000m², Terminal 2 comprises four structures separated by movement joints, with an existing space-frame roof spanning the central atrium and check-in hall. The project required major alterations to this complex building, including 3,800m² of internal floor infills, modifications to primary structural elements and the lateral stability system, and new external structures and bridges.

Structural steelwork provided the flexibility needed to undertake these interventions while retaining the existing façades and roof. The new structure maintained the established column spacing and service strategies, created additional passenger capacity and avoided the need to strengthen the existing foundations. This allowed substantial changes to be made without imposing unnecessary additional loads or disrupting more of the terminal than required.

Using steel also complemented the terminal's original construction, allowing new members to be connected precisely to the retained frame. Components could be fabricated to suit surveyed conditions, transported in manageable sections and assembled within confined work areas, providing essential adaptability throughout the phased design and construction.

Understanding the existing structure was a significant challenge. The terminal had been modified throughout its life, but limited records were available to document every change. Structural analysis models were developed from archived information and supplemented by detailed surveys, creating a reliable picture of the building before the proposed interventions were assessed.

Computational engineering was used to compare the existing and proposed analysis models. A bespoke script identified the effects of each intervention, enabling the design to minimise its impact on the retained structure and limit the number of new structural elements. This detailed assessment was vital when altering load paths and stability systems within a building that remained in continuous use.

One of the most complex interventions was the creation of the “sky bar” beneath the glazed space-frame roof. A carefully sequenced arrangement of temporary and permanent steelwork allowed existing members to be removed and the new floorplate installed without compromising the structure above. The work demanded close control of temporary conditions as the load paths changed throughout construction.

Fabricated plated beams were introduced within part of the new floorplate to minimise structural depth. Reducing the structural zone maximised the available floor-to-ceiling height and preserved space for building services, directly supporting the quality and openness of the passenger environment. Bespoke steel connections were also developed to fit around the retained structure, limit disruption and maintain separation between landside and airside areas.

Every item of internal steelwork was brought into the terminal without a single crane lift. Members were transported through the front doors on wheeled equipment before being moved and lifted into position using rigging and winching. This unusual installation strategy responded to the restricted internal environment and enabled extensive steel alterations to proceed without interrupting the terminal's operations.

Programming and sequencing were governed by the operational airport. Work areas had to remain securely separated from passengers, staff and aircraft operations, while access to airside locations was tightly controlled. The design and construction teams therefore had to remain agile, coordinating structural interventions around changing operational constraints and delivering them within tightly defined working periods.

The project also created new structures beyond the existing terminal. An external transfer facility on the airfield was connected to the main building by a double-storey steel bridge, alongside a new back-of-house vertical circulation core. These additions improve movement through the airport while integrating with the reconfigured internal spaces and established terminal structure.

Reuse formed an important part of the structural strategy. More than 75t of steelwork removed from the existing building was incorporated into the permanent structure, while other recovered members were repurposed as temporary works. The embodied carbon associated with modules A1-A5 was calculated at 137kgCO₂e/m².

The completed terminal provides increased capacity and an improved journey through check-in, security, departures and arrivals. Reduced security queues allow passengers to spend more time within the airside retail areas, while the transfer of airline operations into the completed terminal supports more efficient airport operations. The structural alterations were therefore fundamental to both the quality of the passenger experience and the terminal's commercial performance.

Manchester Airport Terminal 2 Reconfiguration demonstrates the exceptional adaptability of structural steelwork. New members, reused steel and bespoke connections were integrated into a complex existing building, enabling load paths, floorplates and stability systems to be transformed while the airport remained operational. Rigorous analysis, inventive temporary works and crane-free internal installation resolved challenges rarely encountered on conventional projects. The result is a world-class terminal created through the precise and imaginative reconfiguration of its steel structure.



JUDGES' COMMENT

A major upgrade to the existing 71,000m² Terminal 2 structure, all within a live operational environment. Incredibly complex structural modifications have transformed the departure, security and arrivals areas and created a state-of-the-art passenger experience. Bespoke steel connections were devised to limit disruption and maintain separation between landside and airside boundaries. Over 1,000t of steelwork for the inside of the building had to be wheeled in without a single crane lift and lifted into position using rigging and winching.

