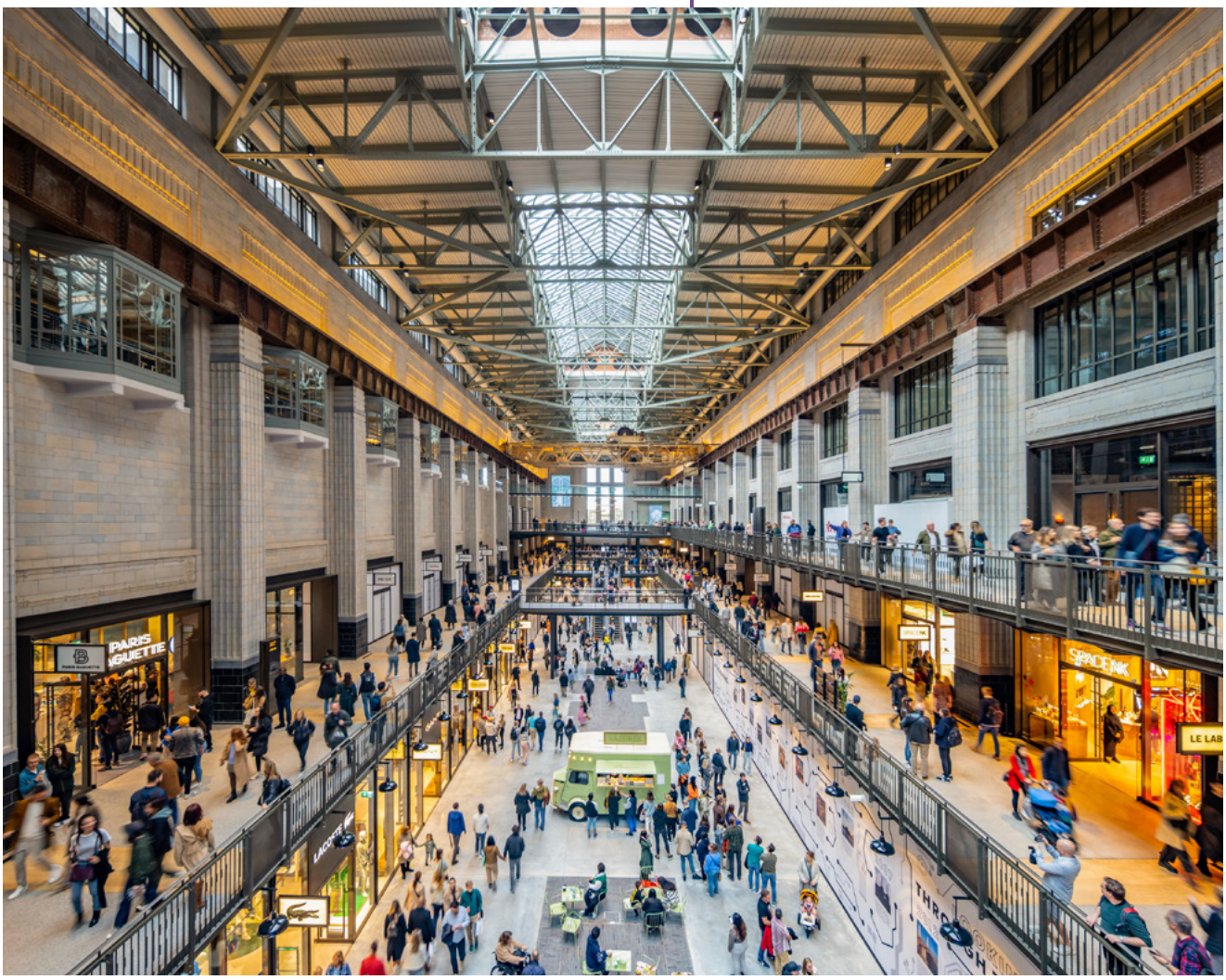
Award

Battersea Power Station, London

PROJECT TEAM

Architect: **WilkinsonEyre**
Structural Engineer: **Buro Happold**
Principal Structural Steelwork Contractor: **William Hare**
Architectural Structural Steelwork Contractor: **CMF Ltd**
Main Contractor: **Mace**
Client: **Battersea Power Station Development Company**



The landmark, Grade II* listed Battersea Power Station has been sympathetically transformed from a much-loved industrial relic into a vibrant twenty-first century destination. The visionary redevelopment of the 231,800m^2 building was carried out alongside the Northern Line Extension, which opened in 2021, at the heart of a major 42-acre regeneration of this former brownfield site.

The Battersea Power Station itself constitutes phase two of this unique project, which has coherently revitalised this central London district. The brief included providing 252 apartments, restaurants, shops, cinemas, six floors of office space and an entertainment venue capable of holding 2,000 people.

The scale, listed status, multiple stakeholders and high-profile nature of the project presented a particularly complex challenge. Working closely with Battersea Power Station Development Company, Historic England and London Borough of Wandsworth, the project team devised several innovative design processes, engineering solutions, and planning & logistic strategies, to support the vision to maximise reuse of the building.

A 'box-in-box' approach was collectively developed to ensure the new framing made best use of the sheer volumes of space; carefully considered its interaction with the existing fabric; overcame the logistical constraints imposed by the existing; and ultimately aimed to express and complement the original fabric.

To bring light into the building, the new floors were set back from north and south elevations of the Boiler House, thereby creating tall atria and exposing the as-found condition of the walls. New support was provided through a bowstring truss and façade restraint beams. In the historic Turbine Halls, new structure was introduced behind the delicate heritage fabric, allowing features such as the new retail gallery decks to be introduced in a 'light touch' manner.

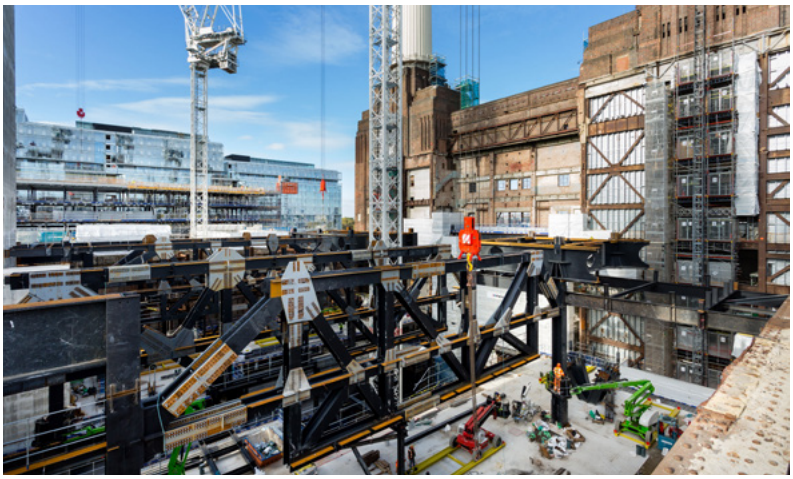
The Boiler House saw five different usages including car park, retail, public/event spaces, office and residential, stacked vertically on top of one another, all ideally needing different column grids. Through frame optimisation and organisation of spaces, these stacked usages were achieved with only two structurally super-efficient transfer levels, one of which doubles as a plantroom. Coordination of key plant equipment with key structural transfers was only possible through the use of steel. The early delivery of Level 05 steelwork was also an essential piece of the plan to facilitate parallel construction of the Boiler House space both above and below Level 05, enabling significant savings on construction programme.

Environmental impact was also a key consideration. The design of the steel beams, trusses and columns was highly optimised to minimise the embodied carbon, while accounting for fabrication and buildability. The reuse of the existing building's foundations, columns, beams and slabs, along with the refurbishment of the external elevations, have led to the reuse of over 40,000t of legacy carbon. This equates to approximately 20% of the total embodied carbon in the structure. Overall, the conservation philosophy follows a 'light touch' approach, with the inclusion of circular economy principles, whilst celebrating the heritage elements through innovative detailing.

The existing building is formed of a steel frame clad in brick. In addition to being sympathetic to the existing building, steel construction facilitated several innovative engineering solutions to benefit the scheme.

The 'light touch' approach within the Turbine Halls required pinpoint accuracy to introduce columns set 75mm away from existing to support new cantilevering Turbine Hall walkways and a new 13-storey building infill inside the Boiler House. To facilitate this proximity without compromising existing foundations, buried concrete-encased 24t steel beams cantilever over new piles to support the new columns.

For the Switch House West duplex apartments, a lean, efficient means to achieve an ambitious 11m 'A-frame' truss cantilever was developed, over the listed Control Room A, increasing the net lettable area of prime residential apartments by approximately 1,860m^2. This cantilever required a carefully considered construction sequence and pre-setting strategy to ensure all tolerances were met when the apartments were handed over.



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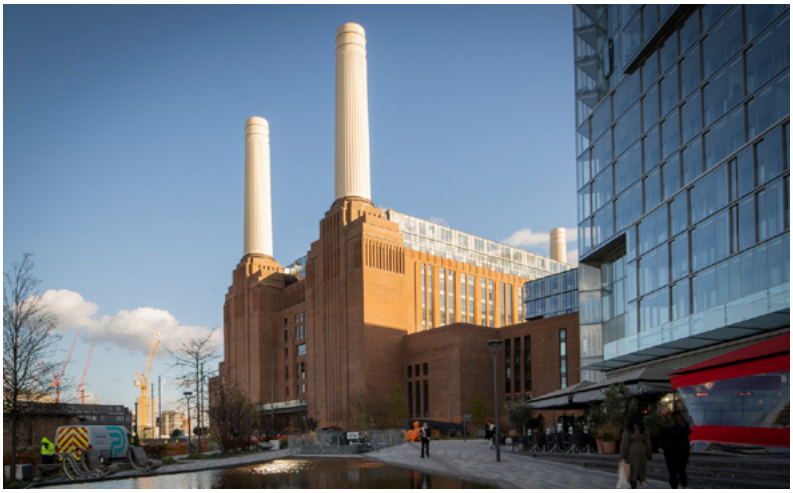

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Within the North Atrium, load transfers were achieved with a scheme that utilised a combination of transfer trusses, beams and 'tree' structures. This represented a significant portion of the over 25,000t of new steel infrastructure installed in the retrofitted building.

The 27m-long, 62t beam spanning across the atrium from Washtower to Washtower sat on an innovative steel saddle and rockerplate solution to ensure its high loads were delivered safely into the new core walls. It's installation as one single element was only possible through the use of one of the largest tower cranes in Europe.

The two vast tree-shaped steel structures in the boiler house each support 30m x 30m of office floorplate over eight storeys, while also serving as architectural focal points within the column-free atrium below.

Transforming Battersea Power Station was a complex project that assures a future for this magnificent building. The sheer scale and complexity of the project's aspirations have meant steel was the only viable choice for delivering this vision.

Judges' comment

The iconic Art Deco Battersea Power Station has been meticulously transformed into a contemporary mixed-use destination. The newly revealed steel structures reflect its industrial legacy, seamlessly integrating with the building's aesthetics. From robust steel tree columns supporting heavy loads to intricate tensile restraint frames and footbridges, every element exudes an elegant touch, showcasing a harmonious blend of design and functionality.