AWARD

Hill Dickinson Stadium, Liverpool

PROJECT TEAM

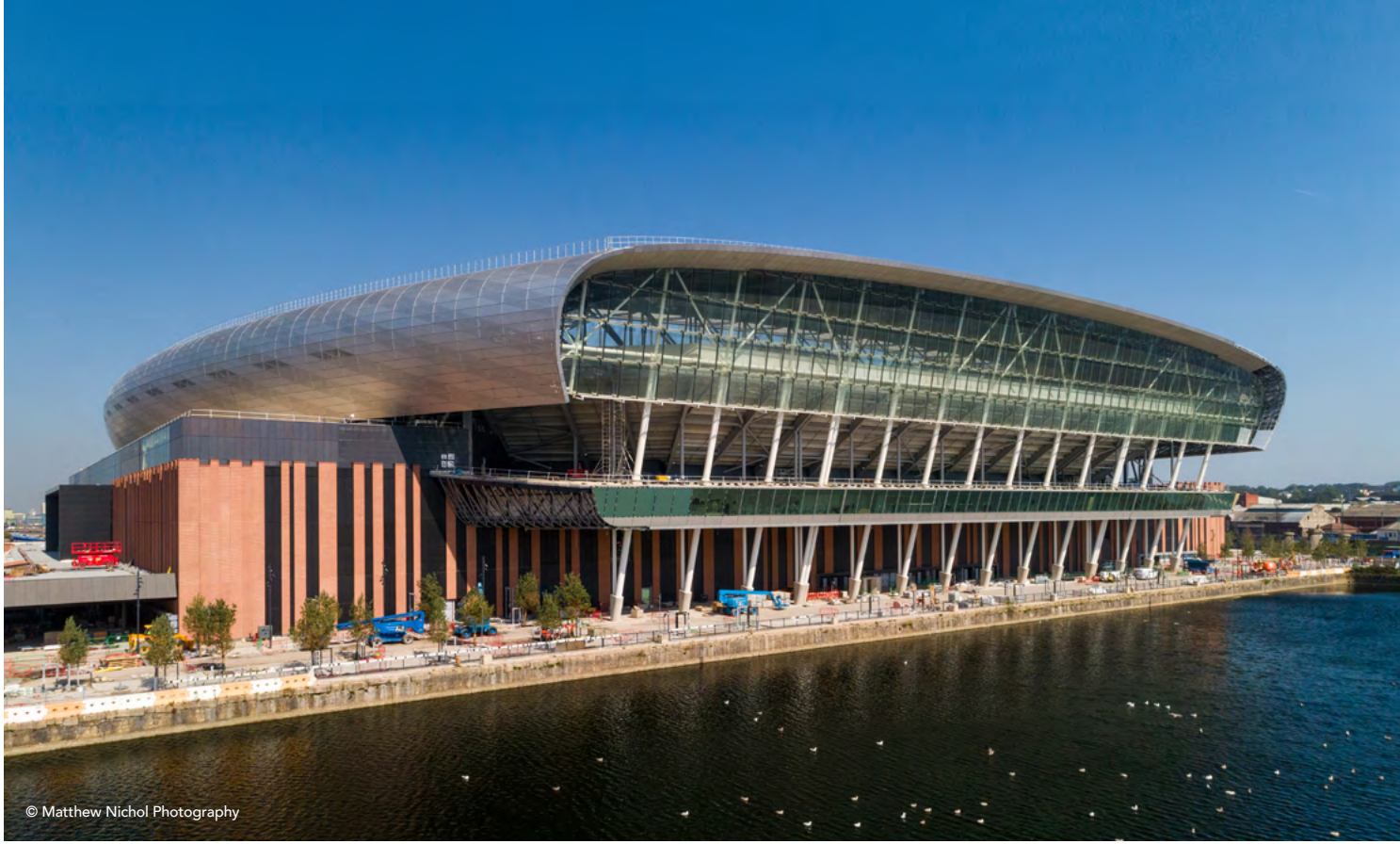
Architect: BDP Pattern

Structural Engineer: Buro Happold

Steelwork Contractor: Severfield

Main Contractor: Laing O'Rourke

Client: Everton FC 'The People's Project'



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Hill Dickinson Stadium occupies a constrained site at Bramley-Moore Dock on Liverpool's River Mersey, providing Everton FC with a new 52,769-seat home. Built within a former Victorian dock, the stadium transforms a previously private industrial waterfront while retaining the Grade II-listed dock structures. Its structural design was central to overcoming the site constraints and delivering the stadium's distinctive architectural form.

The stadium is defined by its sweeping, low-profile barrel roof, which responds to the industrial character of the surrounding maritime buildings. Structural steelwork made this geometry possible, creating long, column-free spans over the seating while maintaining a slender roof profile. Glazed openings at the north and south ends reinforce the roof's strong east-west orientation and provide views towards the city and river.

Over the east and west stands, the steel trusses extend in cantilever for up to 50m. The roofs above the north and south stands are formed by parallel east-west trusses spanning up to 175m. Together, these elements create a coherent structural response to the barrel-shaped enclosure, providing the strength and flexibility required to realise its complex geometry.

Efficient truss depths and high-strength S460 steel reduced the roof's dead load while maintaining the required structural performance. Detailed analysis of loading, pre-camber and deflection allowed the steelwork to remain slender despite the substantial spans. Bearings and articulated joints enable the end roofs and façades to be supported across three separate stand structures, accommodating their interaction without compromising the overall architectural form.

Efficiency was refined through design development, contractor engagement and detailed assessment of loading requirements. The completed roof structure weighs 130kg/m², including purlins and cladding rails, measured across its plan area. Between RIBA Stages 3 and 4, optimisation removed 900t of steel from the roof design, representing an embodied carbon reduction of 2,200tCO_2e.

The scale and movement of the roof required the fabrication model to account for both its design geometry and its pre-set position during construction. As each grid line had a different predicted deflection, the steel model was effectively developed twice: first at the final design level and again at the pre-set level required for fabrication and erection. This ensured the roof achieved the intended geometry after deflecting under its own weight.

The north and south roof trusses measure up to 175m long and 12m deep, with individual trusses weighing as much as 250t. They were pre-assembled and erected in sections up to 60m long, some weighing more than 90t. Complex temporary works and jacking arrangements held each section at its calculated pre-set height before controlled de-jacking allowed the steelwork to move into its permanent position.

The east and west roof structures presented a different erection challenge. Twelve trusses on each side cantilever from the stands, with the barrel form wrapping around the rear of the roof towards the terraces. The cantilevered portions were divided into three pre-assembled lifts, while the curved barrel was erected in smaller sections. Movement was monitored throughout construction, allowing adjustments to maintain the required accuracy.

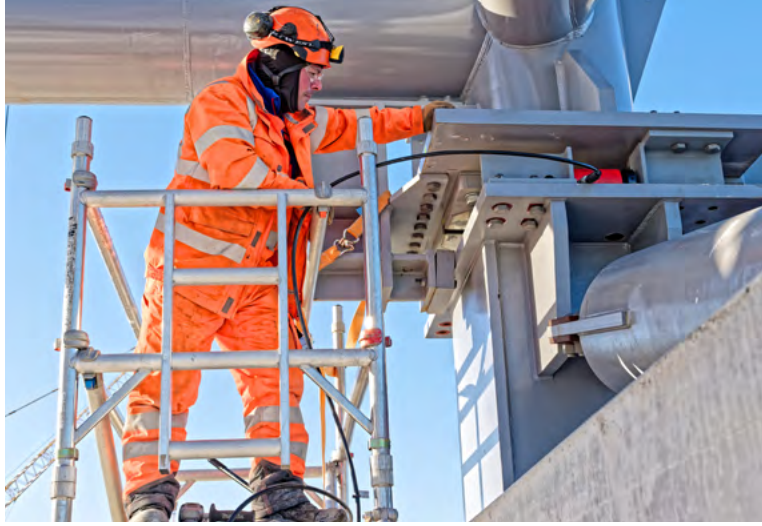
Exposure to high winds and changing weather beside the Mersey made reducing the number of lifts a priority. A dedicated roof assembly area was established on the pitch, using up to ten mobile cranes and 30 mobile elevating work platforms. Pre-assembly transferred work from exposed positions at height to a more controlled environment, improving programme efficiency and supporting safer installation.

The dock location created further constraints. Water, retained heritage structures and existing infrastructure surrounded the stadium on three sides, limiting access, lifting positions and available workspaces. Construction of the eight independent stand structures required detailed planning, particularly at the corners where multiple activities converged. Four-dimensional planning coordinated sequencing, plant selection and access while protecting the historic dock walls.

Temporary works were designed as carefully as the permanent steelwork. Approximately 350t of erection trestles were designed for reuse and are being employed on other projects. Temporary bracing incorporated reused steel where possible, while 100t of bracing was dismantled in full lengths and returned for future reuse. This approach maximised the value of the temporary steelwork required to deliver the long-span roof.

Early collaboration allowed minor adjustments to the permanent works to improve fabrication, assembly and erection. Detailed digital coordination enabled structural behaviour to be considered through every construction stage, from pre-assembly and lifting to jacking and final deflection. This integration of design and construction was essential to delivering the complex roof accurately within the constrained waterfront site.

Hill Dickinson Stadium demonstrates structural steelwork's ability to deliver architecture at exceptional scale. Its high-strength trusses achieve long spans and dramatic cantilevers while maintaining the low, curved profile that defines the stadium. Careful optimisation reduced material use, while precision modelling, extensive pre-assembly and reusable temporary works supported its construction. The result is an efficient and striking roof structure that responds to Liverpool's maritime heritage and establishes a first-class stadium on the banks of the Mersey.



JUDGES' COMMENT

"Built over a historic dock which was infilled with sand from the adjacent River Mersey, the striking low-profile, barrel form of the roof encloses a stadium with unusually high sustainability credentials. The steel has been very carefully designed and detailed, and its installation painstakingly planned to maximise efficient use of temporary works. A truly first-class stadium."