Sustainable choices

FACT FILE
Holborn Viaduct, London
Main client: **Royal London Asset Management**
Architect: **PLP Architecture**
Main contractor: **Multiplex**
Structural engineer: **Heyne Tillett Steel**
Steelwork contractor: **BHC**
Steel tonnage: **3,200t**

Steel sections from the most sustainable sources available have contributed to more than 90% of the main frame for the Holborn Viaduct commercial scheme.

Visualisation of the completed high-level façade along Holborn Viaduct.

From the fourth floor upwards, the building has cantilevers along the Holborn Viaduct elevation.

Sat at the south-east intersection of where Holborn Viaduct spans over Farringdon Street, a City of London commercial scheme with sustainability framed into its design is quickly taking shape.

Topping out at 14-storeys, the building has adopted a number of initiatives that are helping the scheme to achieve the desired BREEAM 'Outstanding' and WELL Platinum accreditations.

Foremost in its sustainability strategy is the choice of materials and their reuse. As a by-product from the initial demolition phase, a quantity of Portland Stone has been retrieved and it will be reused to form the masonry base along the new building's Farringdon Road elevation.

This will allow the new streetscape to blend with the south-eastern gatehouse, which the building has been built around, but does not link into. Overall, there are four of these gatehouses, originally built in the 1860s, that frame the Viaduct and contain public stairways.

Meanwhile, inside the structure, around 80t of reused steel has been obtained from European Metal Recycling (EMR) and incorporated into the structural frame.

Multiplex Project Director Jon Pepper says a steel framing solution was always going to be used for this building.

"As a company, we've built many high-rise commercial schemes in London and steel is always the choice as it is quick to erect and can efficiently create the open-plan interiors tenants want for their modern office environments."

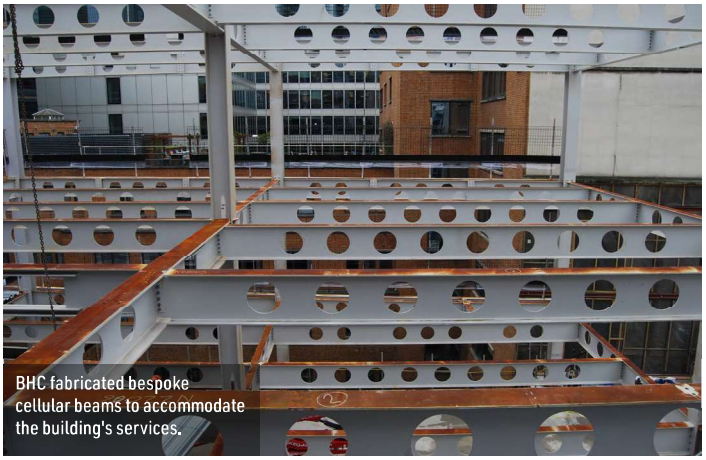
With a steel-framed concept in place from the outset, the design was then rationalised and value engineered once BHC had been appointed as the project's steelwork contractor.

"As our brief was to fabricate and supply steelwork in the most sustainable way, we changed, where possible, the frame's design from plate girders (that are currently only produced via BOS plants) to hot-rolled sections that are readily available from electric arc furnace (EAF) sources," says BHC Project Manager Bobby McCormick.

To this end, more than 90% of the 3,200t steel tonnage used for Holborn Viaduct was sourced from EAF production facilities. Delivering a significant carbon saving, this material is considered to be much greener and more efficient in terms of energy consumption for the production process than the more traditional Basic Oxygen Steelmaking (BOS).

It has been calculated that if the scheme had used 100% BOS sourced steelwork, the embodied carbon would have been 14,705 tonnes of CO_2e. This figure

Like many office developments, the metal decked floors are supported by cellular beams.



BHC fabricated bespoke cellular beams to accommodate the building's services.

The main entrance, along Farringdon Street is set within a curved façade.

has been significantly reduced to 5,816 tonnes of CO_2e with the use of EAF steelwork.

The steel-framed project replaces three separate buildings that were demolished during the scheme's early works.

Like many central London plots, once the demolition phase had been completed, an archaeological dig was undertaken. It had been a while since the site was last unoccupied, and the chances of another historical site investigation in the near future is unlikely.

A number of interesting artefacts were discovered, including seven Roman period coffins, which have subsequently been handed over to the Museum of London.

The preliminary works package, which resumed after the archaeologists had left, was undertaken by Erith Contractors. Its work also included the excavation of a two-level basement, the installation of piled foundations and the construction of two stability-giving concrete cores.

With the completion of this package, the erection of the structural steelwork was able to begin. Steel starts at ground floor level and is arranged around perimeter columns set at 9m centres.

The new office block's main ground floor entrance will be at 32-40 Farringdon Street, while a second entry point will be positioned along the Holborn Viaduct elevation. There is a 9m height difference between the two streets and so the latter entrance is at level two.

As the steel frame wraps around the cores as well as a central atrium, filling up an L-shaped footprint, the internal grid has an irregular arrangement, creating spans of up to 9m for the open-plan floorplates.

All of the internal beams contain bespoke fabricated cell holes to accommodate the building services within their depth. The steel sections also support metal decking and a concrete topping to form a composite flooring solution for each of the levels above ground floor.

Two new public spaces will be created around the building, one of which incorporates the main entrance, which is positioned within a full-height curved façade. This feature allows the structure and frontage to avoid two retained mature London plane trees, which sit at the heart of the new public realm.

Also along the Farringdon Road elevation, the scheme retains Newcastle Close, which acts as a service road for an adjacent office block and railway station. The new steel frame spans over this road, forming an enclosed double-height space that splits the ground and first floors in half.

The majority of the ground floor is also a double-height zone, although to the south of the enclosed service road, a mezzanine level has been added.

Creating even more valuable floor space, the building cantilevers out by 2.5m on every floor from fourth level upwards, along the Holborn Viaduct elevation.

This feature element has been created with the addition of a series of stub beams, bolted to each of the relevant perimeter columns during the erection programme.

All of the steelwork is delivered to site via two pit lanes, which are located along the main elevations.

"We've built many high-rise commercial schemes in London and steel is always the choice as it is quick to erect and can efficiently create the open-plan interiors tenants want for their modern office environments."

Three tower cranes are then used for the steel installation, with the heaviest steel members – around 8t for the columns – all within their lifting capacity.

Overall, the heaviest individual lift of the steel programme has been for a 7m-long bridge that spans the atrium at second floor. The 10t bridge was fabricated, supplied and then lifted into place as one complete unit.

The steel frame erection for Holborn Viaduct is due to finish in June, with the entire building, which has been pre-let to an international law firm, due to complete in mid-2026. ■

The steel frame wraps around two concrete cores.