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Steel design for Cotswolds outlet

Shipbuilding boost for Clydeside

Wide-ranging vision at Hatfield

Repurposing Oxford Street landmark

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Cover Image
Cotswolds Designer Outlet, Tewkesbury
Main Client: Robert Hitchins
Architect: Roberts Limbrick
Main contractor: Bouygues UK
Structural engineer: Clarkbond
Steelwork contractor: William Haley Engineering
Steel tonnage: 1,300t

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Refurbishment shops with steel

The site formerly occupied by one of central London's best-known department stores is being extensively remodelled into a flexible, nine-storey BREEAM 'Outstanding' building.

Predominantly built in the Post War period, the Oxford Street Debenhams department store was once a highlight along Europe's busiest shopping thoroughfare.

Located on a plot that had been occupied by a department store since the mid-1850s, the building's shimmering aluminium façade and lack of windows, made it a West End landmark.

Jump forward 50 years and the post-COVID retail landscape has changed and Debenhams is now one of many large retailers to have come and gone.

Due to financial difficulties, the company that had been in business for more than 240 years ceased trading in May 2021, when its numerous stores, including the flagship Oxford Street premises, closed their tills for the final time.

Today, the site is being extensively remodelled, with sustainability taking centre stage. Instead of demolishing the entire store, a substantial portion of the existing six-storey building is being retained and incorporated into a new nine-storey steel-framed structure.

"There was a planning requirement to retain some of the old building," says Lend Lease Project Manager Rob Hamilton. "It also adds to the project's sustainability credentials as there is an associated carbon saving."

Another of the project's sustainable initiatives is to use structural steelwork sourced from Electric Arc Furnace (EAF) production facilities as much as possible.

EAF steelwork is considered to be much greener and more efficient in terms of energy consumption for the production process, as it can utilise renewable energy from wind farms instead of carbon fuels such as oil and gas, as well as making use of recycled steel.

The retained structure is steel-framed, with concrete encased columns and reinforced precast floor planks. Before new levels could be added to the top, the concrete encasement was removed from the retained columns and the material was surveyed and tested.

The fabric and measured surveys confirmed that the steelwork was in good condition and also informed where column strengthening would be required to support the new upper floors.

Interestingly, many of the retained columns within the southern Oxford Street part of the scheme will be re-encased in concrete as a strengthening method, as this area will be subject to some of the largest loads.

As well as supporting the additional upper floors, the existing steel frame also connects to the new steelwork elements of the scheme erected to the north and west of the plot.

There are approximately 300 new connections, designed and installed to connect the new steelwork to the existing frame. Additionally, there are nearly 2,000 linear meters of slab support angles, for both new decking and existing slabs interfaces.

"The challenge was overcoming the positional tolerances and unexpected details discovered on the retained structure, while ensuring the new interfacing steelwork and strengthening details were able to be installed within NSSS tolerances," explains Severfield Senior Construction Manager Stephen Osborne.

As well as strengthening the retained steel frame, Severfield has also infilled a number of voids, previously used to accommodate lifts, stairs and escalators within the old department store. New steel beams have been installed to infill the voids and support metal decked flooring.

Prior to the steelwork programme commencing, early works on the project included deepening the existing basement by approximately 2.5m, via a secant pile and liner wall construction.

Foundation work consisted of installing a pile assisted raft to limit settlement between the new and existing structures and increasing the bearing capacity of the retained structure's foundations, which allowed them to be reused.

The core was installed in three parts, with two outer slip-formed stair and lifts zones initially formed to the full nine-storey height. A middle connecting lobby core, which consists of steel

How the former Debenhams store will look when the project completes next year.

FACT FILE
334 Oxford Street, London
Architect: **Ilford Hall Monaghan Morris**
Main contractor: **Lend Lease**
Structural engineer: **AKT II**
Steelwork contractor: **Severfield**
Steel tonnage: **2,200t**

New steelwork elements connect to retained steel members throughout the structure.

beams supporting poured in-situ concrete floors, completed the core construction.

Once the preparatory work, which included the existing structure strengthening works, was completed, the steel frame erection package was able to begin. In order to create modern flexible floorplates, the new steel frame is designed around a 9m x 9m column grid pattern, which is slightly larger than the 6m x 6m pattern in the retained areas.

"The client wanted larger open-plan spaces for the new levels, so we have designed the frame above the retained area to be supported on transfer structures, that accommodate the column grid change above level five," explains AKT II Associate Jade Purdy.

The transfer structures serve two purposes as they also support set-backs at levels six, seven and nine that form terraces on all four elevations.

Above level nine, the roof level of the building (10th floor) will accommodate another terrace and an events pavilion located on the south, while the northern part of the roof will house an enclosed plant deck.

Above level five, cellular beams that accommodate the building services within their depth, have been used throughout the scheme. Below this floor, non-cellular members have been used on the new steel-framed areas, matching the design of the retained area and providing a consistent floor plate.

All of the beams and columns – new and retained – will be left exposed within the completed project. The retained steelwork is being shot-blasted, primed and intumescent paint applied. These members will not look the same as the new steelwork elements, but their age will be expressed and highlighted.

Fitted out to Class E, which provides the scheme with the flexibility to be used by a number of different end-users, it is envisaged the 334 Oxford Street will predominantly be an office building. There will also be retail located at basement, ground and first floor levels along the south elevation, while the north will have retail on its ground floor.

334 Oxford Street will be complete in September 2025. ■

"There was a planning requirement to retain some of the old building. It also adds to the project's sustainability credentials as there is an associated carbon saving."

Severfield has used its recently launched adjustable temporary bracing system that can be disassembled and reused.