

Award

1 Triton Square, London

PROJECT TEAM

Architect: **Arup Associates**

Structural engineer: **Arup**

Steelwork contractor: **William Hare Ltd**

Main contractor: **Lendlease**

Client: **British Land**



© Simon Kennedy

1 Triton Square is a 31,200m² redevelopment at Regent's Place in London. The original building was completed in the 1990s and, twenty years later, the scope of this redevelopment was to double the office floor area and create an exemplary sustainable and healthy workplace.

British Land saw the potential to increase the building's size and transform it for today's workstyles, opting for refurbishment to save time, money and carbon. Arup was the original designer for the building and worked with the developer to retain and refurbish as much of the existing building as possible,

rather than demolishing and starting again with a new building.

The brief for 1 Triton Square was to create a healthy workplace for 3,500 people with exceptional amenity, daylight and social connectivity. The atrium and new structure have been designed to incorporate satellite stairs, 2.7m-high floor-to-ceiling windows that fill offices and stairwells with natural daylight, nearly 500m² of green roofs that promote biodiversity, five panoramic terraces that provide space for socialising, working and relaxing and 536 cycle spaces, along with lockers and showers, to encourage active lifestyles and green travel.

The architectural redevelopment of this 1990s office building reimagines it into a 21st Century workplace that is appropriate for today's workstyles.

The new building streamlined the atrium and cores of the existing structure, adding additional floor space to each existing level, and used lightweight materials to add three additional floors of office space and relocated the same amount of plant space to the new roof. Additional terrace space was created with retail, gym and community uses being retained at ground floor level.

With twice as much net office area, the refurbished building re-establishes itself in its urban context, engaging with the street and local surroundings much more.

The original 1 Triton Square building was a six-storey reinforced concrete (RC)-framed structure with steel-framed stability cores in each corner. A striking feature of the building was that it housed a large 36m-wide central atrium, alongside a smaller atrium in the entrance area.

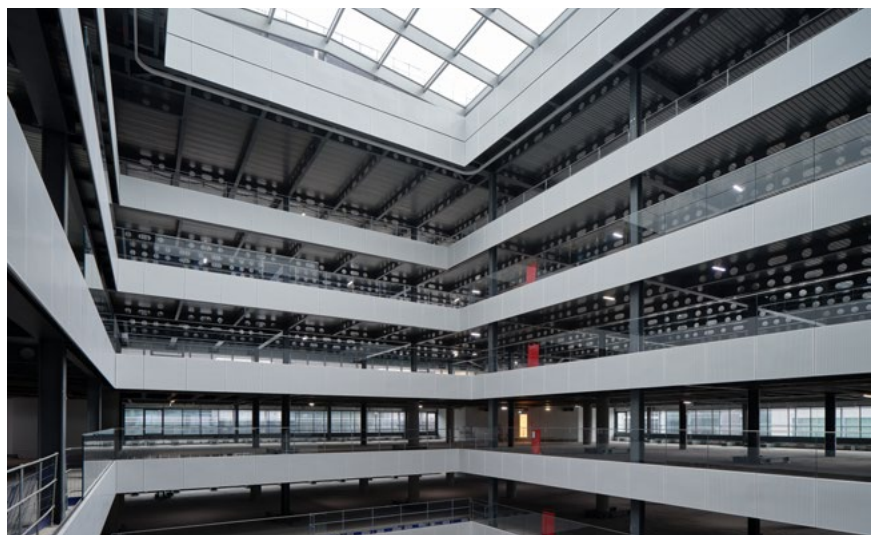
The structural scheme involved nearly doubling the area of the building by adding three new floors on top of the existing, part infilling the central atrium, and infilling most of the entrance atrium. New loading on the existing building was minimised by using lightweight composite steel and concrete floor construction both in the cores and across the main floorplate.

All the new steelwork for the scheme is supported on either the existing steel cores or the main RC frame. Within the entrance atrium the existing structure was cut and carved down to the basement to allow new RC lift pits and a ground slab to be constructed, from which the new steelwork for the entrance atrium was erected.

The new scheme has resulted in the existing structure being exposed to significant increases in loading. As a result, prior to steelwork contractor William Hare beginning its package, Lendlease had to undertake preliminary works that included strengthening existing concrete columns as well as installing 180 new piles in preparation for the new steelwork. This early work also included the removal of a steel-framed glazed roof that covered the atrium.

The addition of three new storeys translates to a significant increase of the horizontal loads on the building. Despite the new scheme making use of the existing RC frame to take some of these stability loads, the capacity of the existing bracing system was exceeded. Therefore, before starting to add the new steelwork to the cores, the existing diagonal braces were sequentially replaced to accept the additional loads. The new levels required some complex column base connections in the cores as the original steelwork below was found to be out of position in some locations.

Where possible, the strengthening of existing steel core columns was typically undertaken by welding steel plates to the existing UC sections. The majority of these plates were positioned between the flanges of the UC section, allowing the size of the columns to remain largely unchanged while achieving a significant increase in capacity. Work within the existing cores was heavily



© Simon Kennedy

constrained due to the adjacent precast façade, and so the plate strengthening was arranged to suit the limited access. The steel plate strengthening option was significantly lighter than the concrete encasement option, limiting the impact on the structure below.

British Land set high sustainability aspirations for 1 Triton Square through their Sustainability Brief for Developments, which sets targets for exemplary Wellbeing, Community, Future-proofing, and Skills and Opportunities. The project was awarded a BREEAM 'Outstanding' rating and has been named one of the UK's most sustainable HQs.

The project has been delivered 30% faster than a new build, with 6,000 fewer lorry journeys required. 40,000 tonnes of carbon have been saved compared to a new build with as much of the existing structure and façade as possible being reused.

Judges' comment

This outstanding project is an exemplar of sustainability thanks to the use of steel. It demonstrates how an existing building can be almost doubled in floor area, for a fraction of the embodied carbon of a new building the same size. The achievement was a clear team effort where all options and details were scrutinised to meet the client's tough brief.