

# 80 CHARLOTTE STREET, LONDON

This new London commercial building is a celebration of concrete. With smooth post-tensioned slabs in the structure, dark polished floors and timber-textured GRC panels expressed internally and the impressive board-marked concrete façades, the material is at the core of the building's distinct identity.

**8**0 Charlotte Street is a 320,000ft<sup>2</sup> (29,730m<sup>2</sup>), BREEAM 'Excellent'-rated commercial building in the heart of Fitzrovia, designed by Make Architects for Derwent London.

The project's 90 × 90m island site was originally built for the Royal Mail in the 1960s and has been combined into one building. It is inherently urban in its integration of the city and street context, both in its massing and composition, combining the existing fabric with new-build elements and is characterised by varying façade treatments, heights, setbacks and terraces. This technique fragments the block externally into a seemingly smaller scale that helps tie the building in with the surrounding vernacular of Fitzrovia, of distinct townhouses and buildings from different eras.

## LANGUAGE OF FRAMES

The detailing took inspiration from mid-century modern architecture and the sculptor Donald Judd, with concepts that evolved around the language of frames, crafted from a variety of materials that provide texture, contrast and honesty in structural expression. Concrete offered this range in both structural performance and architectural finish, along with the added opportunity for use of recycled aggregates and its thermal mass benefits. With concrete a key material constant, it was playfully applied in a rich variety of ways to complement the adjacent material palettes of bricks, timbers, metals and glass.

80 Charlotte Street has a strong architectural language created by the board-marked concrete façade, which dominates the building's exterior and was inspired by

Denys Lasdun's National Theatre. Composed of modular portal frames, panels and posts, the timber formwork adds rich detail to the façades and references the base of the nearby BT Tower and Cavendish buildings in Fitzrovia. The enhanced texture of the concrete complements the handmade Danish Petersen bricks of the corner building and the retained façades on the Whitfield Street elevation.

As a centrepiece, the board-marked mass of the L-shaped entablature sits delicately on the elegantly thin weathered steel portico entrance that punctuates the façade to form the main entrance on Charlotte Street.

## MOCK-UPS

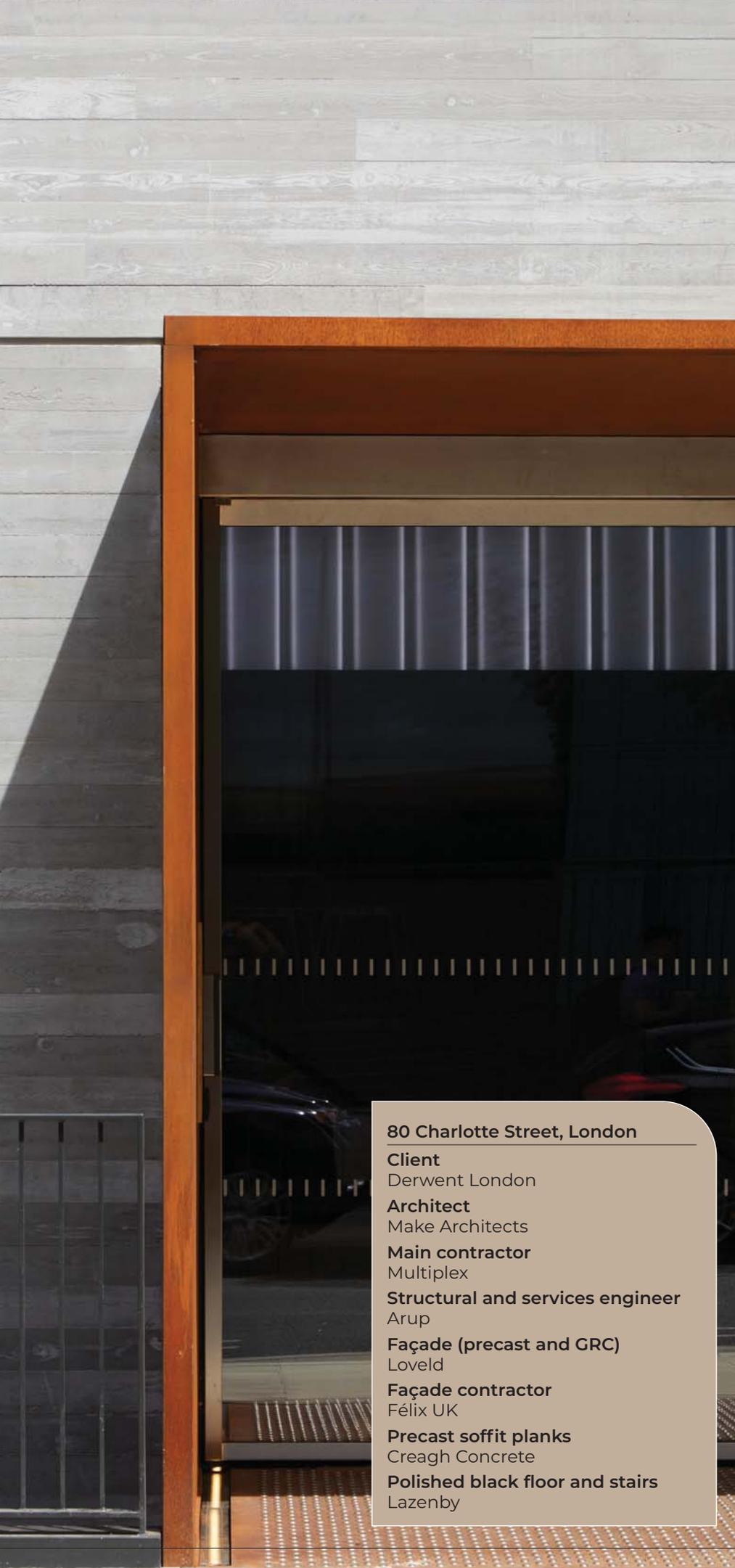
The design team worked closely with the façade contractor Félix and the supplier Loveld. Specialist concrete casting and multiple mock-ups were procured to help develop the design and specification during design stages.

The concrete frames were supplied in modules, stacked and hung from steel angles to form a curtain wall, which recesses and projects across the façades.

The board-marked concrete itself was innovatively made by using planed and brushed European spruce, butt-jointed to form moulds on a steel strongback that was then vibrated during the casting process. The density of the timber grains vibrated differently, resulting in the ghosting of the timber pattern with light and dark concrete 'veins' formed by varied particulate concentration in the concrete, while maintaining a flat and smooth surface. The timber planks could be brushed and reused for up to six castings before needing to be planed down or turned for use



**MAIN PHOTO:**  
80 Charlotte Street, board-marked concrete and weathered steel entrance.



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in new moulds, maximising the longevity and minimising waste.

The overall effect is a building with a handcrafted textural patina and tactile quality that, despite its size, sits comfortably in its surroundings and will stand the test of time.

Concrete in smooth form can be found across the building's structure. Working with Arup engineers, the structural design led to a hybrid steel structure and services zone with 150mm-thick × 1.5m-wide post-tensioned concrete planks to provide large spans of up to 7.5m. This optimisation allows for a compact floor build-up of 650mm that, over ten storeys, allowed for an extra floor to be incorporated at 3m floor-to-ceiling height and delivering 40,000ft<sup>2</sup> (3716m<sup>2</sup>) floor plates. The post-tensioned planks were cast using metal sheet formwork with a solvent-wax release agent that resulted in a smooth polished soffit appearance, particularly important in the exposed soffit design set against the expressing steel structural frames.

#### LEFT EXPOSED

The core is jumpformed and left exposed in the escape stairs that include precast as-struck flights with set-in cast iron nosing and metal balustrading. Here, the light, fair-facing contrasts with the patchy grey jumpformed walls.

Lazenby's dark grey polished concrete floor can be found in the lift lobbies on every floor and in the entrances, chosen not only for its aesthetic but also for its hard-wearing and easy maintenance properties. This is off-set by other cementitious-based materials, such as light grey terrazzo tiles with marble aggregates in the toilets; a play in contrast through patterns.

#### TEXTURED

Concrete with texture dominates the lift lobby walls, using light grey GRC panels by Loveld that are 20mm thick. These panels continue into the atria, forming horizontal bands that enclose fresh air

#### 80 Charlotte Street, London

##### Client

Derwent London

##### Architect

Make Architects

##### Main contractor

Multiplex

##### Structural and services engineer

Arup

##### Façade (precast and GRC)

Loveld

##### Façade contractor

Félix UK

##### Precast soffit planks

Creagh Concrete

##### Polished black floor and stairs

Lazenby

## Judges' Comments

*The thought, detailing, trialling and execution extended to the concrete feature precast façade, internal GRC cladding, jump-form cores, polished lift lobby and entrance floors and precast floor plate units is exemplary.*

*The external board-mark finish façade is bespoke European spruce of deep texture set with varying steps between planks. A lot of detailing and production went into creating the 'natural' effect.*

*Internal GRC board-mark has a light texture and is consistent light grey. The texture works particularly well with incidental lighting along the shadow gap with soffit. The transition of the inclined geometric lines between atrium, stairs and corridor etc, is extremely well presented.*

*The precast stair units are very good, cast on their side including the nosings. The prestressed 7.5m floor planks are better than normally seen. This was down to all the parties being involved in developing the desired finish. The dark grey exposed aggregate polished floor was also well executed.*



(Photos: Jack Hobhouse.)



**TOP:**  
Concrete atrium.

**INSET:**  
80 Charlotte Street  
exterior.

plenums that serve the office floors and are topped by an ETFE roof.

GRC was chosen for its thin, lightweight and strong characteristics, given the plenums are cantilevered off the main slabs – a complex structural, mechanical and sculptural challenge. Architecturally, the plenums follow the geometric volume of the atrium as it steps and articulates to form projecting balconies, office bays and the feature stair.

Reckli formliners with digitised timber planks were used to cast the 3D relief on the surface of the GRC, enhancing the texture and adding interest to the uniform colour. This is further enhanced by oblique contrast feature lighting. The timber texture expressed on the surface of the GRC blends with the natural oak Dinesen floor in the reception and on the balconies, and transitions tonally with the smooth concrete soffits and dark concrete floors.

### SUSTAINABILITY

The building is rated BREEAM 'Excellent'. It makes use of a minimal structural build-up though pre-tensioned concrete slabs on a regularised 6 × 9m structural steel grid. This reduces the embodied

carbon over that of larger-span office structures. Combined with the raised-floor air supply, this leaves the concrete soffit relatively exposed, providing inertia against temperature fluctuations, thereby reducing cooling and heating loads through the concrete's thermal mass. In addition, the extensive use of structural elements as architectural finishes minimises the eCO<sub>2</sub> that would have been used in wall and ceiling finishes.

As well as reusing the existing façades, the building has been designed as all-electric, using renewable electricity – futureproofing for a change in London's energy supply. The atria also pull in and recycle fresh air, which can be combined with openable windows for a mixed-mode strategy. The building is net zero carbon.

The residual embodied carbon from this scheme totalled 19,790 tonnes CO<sub>2</sub>e, measured from cradle to completed construction, or A1–A5 under the BS EN 15978<sup>(1)</sup> assessment framework, which represents an intensity of 506kg/CO<sub>2</sub>e per m<sup>2</sup>. The final figure is a 49% improvement from the LETI baseline.

Significant supply chain engagement has ensured concrete selection, from foundations to façade, is as resource efficient as possible.

Key design development changes were undertaken to ensure concrete strength match is used, reducing loading on the structure. Much of the internal concrete used in the atrium and lift lobbies was changed to thinner GRC panels, which reduced embodied carbon in manufacture and transportations, as well as providing savings in steel design in the atrium. The external concrete façade is semi-structural, with each unit hung individually, containing a preassembled, unitised cladding panel. This improves the façade programme significantly over a more traditional wall build-up and secondary structure.

80 Charlotte Street's expressive use of concrete is unique for a commercial development of this size and a testament to the client's determination to deliver unique and exciting workspaces. **C**

### Reference:

1. BRITISH STANDARDS INSTITUTION, BS EN 15978. *Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method.* BSI, London, 2011.