

## **Technical study – atrium plenum air supply**

The buildings' three atria are clad in ribbons of concrete which conceal air supply plenums within. In places, the cladding folds down to form projecting office spaces and balconies.

The air plenums supply fresh air directly to the office floors. They are fundamentally required due to the constrained floor-to-floor height of the original structure and the lack of suspended ceilings, as well as the necessity of a minimum raised floor.

The air supply is delivered to the horizontal plenums via vertical risers from the rooftop plant, at the three corners of the central core. The plenums are located directly under the raised floor and configured to minimise the distance for the air to travel to the furthest most spaces on the floor.

The atria plenum is formed and finished in board-marked GRC (glass-reinforced concrete). The innovative plenum design is representative of the collaborative engineering and design approach to the project.

## **Sustainability strategy overview**

80 Charlotte Street is a building conceived with net zero carbon operation in mind, and the building's size lends itself to an economy of scale in terms of material and environmental performance.

The building is designed for a decarbonised energy supply through the specification of an all-electric energy supply, enabling the client, Derwent London, to operate a net zero operational carbon building from day one.

In respecting the floor-to-floor heights of the site's predecessor, in order to retain the elements of the existing facade, the new building makes use of a minimal structural build-up through pre-tensioned concrete slabs on a regularised 6mx9m structural steel grid. This reduces the embodied carbon over that of taller, larger-span office structures. Combined with the raised floor air supply, this leaves the concrete soffit relatively exposed, which provides inertia against temperature fluctuations, thereby reducing cooling and heating loads. The extensive use of structural elements as architectural finishes minimises the embodied carbon that would otherwise have been used in wall and ceiling finishes.

The deep floorplates provide energy advantages by minimising external wall area, although this is balanced with the need for daylight. Here the three internal atria play a crucial role by providing both daylight deep within the plan and also delivering fresh air to the office spaces. The atria are the active heart of the building's environmental and wellbeing strategy, providing the route for fresh air within the atria spandrels. They are also a valuable source of daylight and visual connection to the sky and external weather conditions. The atria are crowned with large ETFE 'pillows' which allow in daylight whilst protecting from solar gain. The circulation areas at the base of the atria will also benefit from the colour and variability of natural light from the sky. The atria are also used at night to purge the stored thermal mass heat within the concrete structure.

The island site allows the facade to respond to each orientation, minimising solar gain whilst maintaining daylight and views out, through an articulation of window area, deep reveals, and glazing selection. The facade also makes use of operable windows to allow direct seasonal control by occupants, increasing connection with the outside. Additionally, when windows open, the local air conditioning will automatically turn off to save energy.

## **Social sustainability**

There are numerous amenities within and around the building which contribute to a healthy user experience. These include roof terraces, the daylight feature stair, high-quality communal spaces, and atria balconies that together provide a workplace where people will feel and perform at their best. Occupants also benefit from 306 cycle spaces with showering facilities, which encourage healthy journeys to work.

The development gives back to the public realm through the provision of the south-facing Poets Park, which provides shelter from the hustle and bustle of Fitzrovia's streets. It incorporates extensive planting, seating and public art for the benefit of all, and a publicly accessible café spills out into the area.

Extensive areas of the terraces and roof are given to biodiverse roofing and intensive planting, mitigating the effects of biodiversity loss and enhancing green infrastructure.

During the design and procurement process, waste reduction and materials optimisation were considered at a variety of scales. These include the use of lightweight GRC cladding panels internally, in lieu of pre-cast concrete, to reduce the material volume, as well as the manufacture of the washroom terrazzo tiles to the final installation size prior to arrival on site, in order to reduce waste.

The building achieves BREEAM 'Excellent' Rating as well as LEED 'Gold'.