



Biophilic Building for Human Resilience: The Spine Liverpool, the Royal College of Physicians New HQ

By Rob Hopkins and Steve Edge

All Images by Dan Hopkinson / AHR

Following a Royal College of Physicians (RCP) led competition, [AHR Architects](#) were commissioned to design the new northern home for the RCP, The Spine in The Knowledge Quarter, Liverpool UK. Designed by architect Rob Hopkins, Regional Director at AHR. The Spine is set to become one of the healthiest buildings in the World.

The philosophy behind the design of The Spine draws on

the narrative of the human body and its abstract representation through architecture, biophilia and salutogenics. With the College as the anchor tenant in The Spine, the development has enabled the Knowledge Quarter in Liverpool to attract further leaders in science, health, technology, culture and education. This has already been manifested in the recent opening of a Pandemic Institute in The Spine and over the next decade

it will continue to establish Liverpool as one of the world's leading healthcare innovation districts.

“The UK’s Royal College of Physicians was established by King Henry VIII in 1518 as the first recognized body in Great Britain to regulate medical practice. The College for many years was considered as an elite institution with only up to 8 people each year invited to take

the examination and potentially become a member. This ritual involved scrutiny by the RCP committee in the Sensors Room, a space that has followed RCP to each of its homes.” (Moore 2014).

The RCP are now pioneers in all areas of medicine, authoring numerous evidence-based papers and reports. However, based in London since 1964, the organisation was starting to have a “London-centric” reputation and needed to significantly expand its facilities in order to reflect its standing in the world of medicine. The London base for the RCP was designed in 1964 by Sir Denys Lasdun and was highly influential for Hopkins when creating his design narrative for The Spine, as Lasdun placed a similar importance on the use of natural light and themes relating to the human body in his design.

The WELL Building Standard, created by Delos Living LLC, is a performance-based system

for certifying and monitoring the built environment and its connection to user health and wellbeing. When compiling the WELL Building Standard, Delos unsurprisingly referred to much of the RCP’s research. So, together with the client’s brief for the occupants, “to be healthier when they walk out of the building than when they walk in”, WELL was a natural starting point for Hopkins to work from when designing The Spine. Hopkins later commissioned [Salvedge Sustainable Design Ltd](#) to work with his design team, in providing biophilic and salutogenic design strategies, to help them attain the highest standards possible in WELL and BREEAM sustainability certification. To date, The Spine is the first building in the world to be awarded a WELL Platinum for the construction and fit-out and a BREEAM Outstanding for the structure. Furthermore, it has attained 109 out of a possible 110 WELL Version 2 Credits,

the highest of any other WELL building in the World.

The Spine takes its name from its striking geometric staircase, inspired by the human vertebrae, located at the rear on the North Side of the building. Occupants are encouraged to use the staircase rather than the elevators, as it offers panoramic views across Liverpool, as far as the mountains of Snowdonia in Wales to the south and those of the Pennines in Yorkshire to the north. “Movement” is one of the WELL Standards Concepts, and providing a “Visual Connection with Nature” is the first of [Terrapin Bright Green’s 14 Patterns of Biophilic Design](#).

Terrapin Bright Green is an environmental consulting company which has conducted extensive interdisciplinary research and used empirical evidence to create the “14 Biophilic Patterns”, which are invaluable to designers. Both AHR and Salvedge used a key selection of these patterns to help them focus their strategies. Their use of biophilic patterns was combined with data gathered from a RCP staff questionnaire regarding innovative work activities, physical features, service features etc, to help ensure that the resulting impact the design would have on employees’ productivity, health, wellbeing, pride and sense of community, was evidence based.

The design narrative of the human body is most evident in the distinctive façade pattern of the building, which takes



its influence from the human skin and has been created by using a mathematical Voronoi pattern, resulting in 23 million unique polygons etched into the glazing of the curtain walling system. This not only helps control solar gain but also simultaneously creates a form of a “forest canopy” of internal shading, reminiscent of the Japanese health practice Shinrin Yoku, (Forest Bathing) and simultaneously complying with the 8th Biophilic Pattern, “Biomorphic Forms and Patterns”. Additional “body” concept features are the buildings’ exposed internal concrete supporting columns that have been cast and moulded to represent a trabecular pattern, the strongest part of a human bone for reflecting mechanical stress.

Further biophilic interventions are The Spine’s series of double-height sky gardens acting as “vertical villages” to represent the “lungs” of the building. These

contain a rich mix of plants and trees that help increase oxygen levels, whilst also promoting the building’s biophilic and salutogenic properties. The helical stairs also provide a visual and physical connectivity to the planting between floors.

Biophilic buildings aim to bring you in tune with your surroundings. Accomplishing this requires all aspects of the building; lighting, air, water, and the space itself, to evoke the natural environment. This means that, where possible, they should all have a biological reference. Consequently, sensor-based monitors are used extensively to control such features. The glazed curtain wall system also uses timber on the interior face of the structural framework to ensure that there is always a visual and tactile connection to nature, which follows the design teams’ philosophy for materials and finishes that “if you can touch it, it’s real.”

Every individual computer has access to a dashboard with real-time environmental data relevant to the building and their own workspace. Sensors fitted into light fittings detect how spaces are used, how often and by how many. The human body doesn’t appreciate uniform temperatures, so workspaces have been designed instead to allow the optimum three-degree variance across the floor, delivering pockets of warm and cool air. So, individuals can move to areas they feel most comfortable with and psychologically, they will hopefully feel that their personal needs are being catered for. When applied in a workplace setting, each of these can have a significant and measurable impact on human response mechanisms, reducing stress and improving overall resilience to long indoor working hours.

There is extensive evidence that demonstrates that by introducing biophilic strategies into the built environment, cognitive performances are improved, stress recovery is enhanced and physiological responses such as heart rate and blood pressure are reduced as well. The economics of biophilia are therefore plain to see, so what might initially be a small percentage increase in design and construction costs, and in some cases no extra cost at all, if implemented correctly and thoroughly by professionals, can provide an excellent return on investment, saving money in the long term for all concerned.

Having spent time with the RCP in London, Hopkins came to understand its staff’s working

practices and what was needed for RCP’s new northern home, whilst still preserving Lasduns’ legacy. This is a new chapter for the RCP as the anchor tenant of The Spine, placing it in the heart of a world-class community of innovators and fortifying their reputation as principals in their field.

Resources:

AHR. <https://www.ahr.co.uk>.

Moore, Rowan. 2014. Anatomy of a Building. Little Brown Book Group.

Salvedge Sustainable Design Ltd. <https://www.salvedge.co.uk>.

Terrapin Bright Green. 14 Patterns of Biophilic Design. <https://www.terrapinbrightgreen.com/reports/14-patterns>.

The Spine. <https://www.salvedge.co.uk/single-project>.

Rob Hopkins, Architect and Interior Designer for The Spine, Director and Head of Sustainability at AHR Architectural and Building Consultancy Practice

Steve Edge, Biophilic Design Consultant, Salvedge Sustainable Design Ltd.

