

CASE STUDY | BUSINESS SPACE

SCOTT BROWNRIGG⁺

CABI HEADQUARTERS

WALLINGFORD, OXFORD



OVERVIEW

Project name: CABI Headquarters

Address: Nosworthy Way, Wallingford, OX10 8DE

Project value: £10m

Building size: 2,787 sq m

Completion date: October 2020

Client: CABI

Architect: Scott Brownrigg

Interior Designer: Scott Brownrigg

Project Manager: Ridge and Partners

Structural Engineer: Perega

Services Engineer: Hoare Lea

Contractor: Barnwood Construction





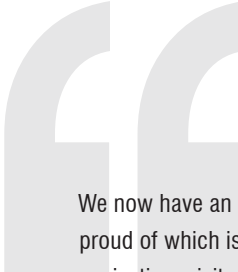
CABI HEADQUARTERS

CABI are a not-for-profit organisation who apply scientific expertise to solve problems in agriculture and the environment. Millions of the world's most vulnerable people face invasive weeds, insects, plant diseases and animals and these disproportionately affect vulnerable communities in poor rural areas, especially in developing countries which depend on healthy ecosystems for their livelihoods.

Scott Brownrigg won the design competition to create a new HQ for CABI, who, for the past 33 years have been located in a school built in the 1960s in Oxfordshire. The old building required a high level of maintenance, and diverted valuable funds into running costs and heating, CABI desperately needed a new, energy-efficient, purpose-built HQ in Wallingford.

Designed during the United Nations 'Decade on Biodiversity' from 2011–2020. The project aim was to celebrate life on Earth, to highlight the value of biodiversity to our lives and to call for a renewed effort to safeguard the variety of life.

Our goal was to create a new headquarters which embodied the CABI mission statement, and craft a low energy design, that offers a two-storey office space, successfully integrating an experimental bio-diverse landscape with a new collaborative flexible working environment.



We now have an office that we can truly be proud of which is fitting for an international organisation, visited by guests and staff from around the world. It is truly in keeping with our mission and values to protect the environment and biodiversity whilst also being an impressive local landmark that will put us on the map more visibly in the community.

DR TREVOR NICHOLLS
Former CABI CEO







THE BRIEF AND AIMS

The brief was for an ultra-low-carbon headquarters for CABI. Funds that could be used for CABI's scientific research to solve problems in agriculture and the environment were being diverted into running and maintaining their old obsolete school buildings. CABI needed to sell the school site that they occupied to generate the monies necessary to create a new low energy HQ for the future.

This sale generated limited funds for the creation of the new office, and departure from the old buildings to make way for the new residential development was on a strict timescale.

CABI's previous buildings were unfit for purpose. It was a decrepit school building, over 50 years old and there were serious problems in use; maintenance was very expensive. Staff comfort and morale were major concerns due to the poor working conditions; sustainability was very poor, with very high energy costs.

The Building

The new Headquarters needed to accommodate 200 staff in 2,800 sq m of floor space. With a high quality building that focused on robust detailing to minimise ongoing maintenance. Located in the greenbelt, the building needed to blend in with the landscape and be no higher than existing structures.

Performance

- Low carbon CO2 emissions impact during construction and operation.
- Highly efficient external envelope.
- Low running costs, low maintenance.

The Environment

- Extensive landscaping to reflect CABI's business objectives.
- Appropriate parking and site roads with minimal visible security.
- Integration of the building and landscape.

The Interior

- Efficient structural grid on a 1.5m planning module.
- An internal space that encourages open plan collaboration with segregation for focused working and study, with flexible office space.
- Staff facilities include a restaurant/sandwich bar, tea points, changing rooms for outdoor sport and a multi-use auditorium.

Commercial

- Low risk procurement strategy.
- Good certainty of outturn cost.
- Be delivered within the shortest timescale possible without compromising the other objectives.



THE DESIGN

Flexibility

The building has future flexibility at its heart. Conceived as a series of interlocking wings, the form is designed for the possibility of future expansion, additional wings can be added, for laboratory use, greenhouses or additional offices and facilities.

Each of these wings is accessible from the central loggia street and can be sub-let if required, accommodating contraction as well as expansion.

Sustainability and running costs

The second important requirement was a sustainable building with ultra-low energy costs. This has driven the energy efficient form, which is designed to minimise solar gain and maximise natural light and fresh air, with detailed strategies for materials, orientation and structures.

At the heart of this project is CABI's commitment to encouraging biodiversity and to protecting the environment. The project uses this as key design driver. A series of biodiverse landscapes have been created. The building slides under, and full integrates with the landscape to form a series of interlocking wings where diverse biophilia creates the living roofs which have a natural cooling effect, reducing the need for cooling.

Future proofing

This 'passive design' strategy takes a 'fabric first' approach, the careful orientation and ground hugging building uses a form of self-shading, and the evaporative cooling effects of the living roof to reduce the requirements for artificial cooling and heating.

This strategy is combined with a plenum floor, which can 'temper' the air during the summer ensuring the building is future proofed against increasing summer temperatures due to climate change.









Site context

Situated within the green belt, on open fields, the building had to blend with the surrounding landscape to achieve planning approval. Folding this landscape over the accommodation with a gentle organic form was strongly embraced by the local authority. On the back of this design, the enabling residential project was understood as necessary to provide the funds to allow CABI to create this project.

Loggia Street

The unique concept is a 'Loggia Street' which runs from the entrance, through the reception and cafe space and past the core, meeting rooms and offices spaces through to the landscape beyond. This organising strategy allows a series of elements to 'plug-in' to this central communal street.

The first is a main office wing on the right-hand side, connected to the reception, this is followed by a 'break' incorporating stairs and roof light separating the central facility wing on the left with the core on the right. A second break with a roof light and external access forms a separation to the second office wing which again plugs into the central spine on the right hand side.

This loggia street is conceived to future proof the design to allow future wings to extend the building into the landscape beyond.

Office wings

The loggia street is orientated due North-South, and this ensures the office wings sit perpendicular to this, running East-West. This orientation ensures that the offices only have the southern elevation exposed to the sun, and this is shielded with horizontal solar shading. The east and west elevations are effectively non-existent and this passive design keeps cooling requirements to a minimum.

The office wings curve down to meet the ground to the east with the landscape rising to cover them; internal double height balconied connections ensure the floors are connected together visually and physically. This sense of connectivity guarantees that the whole building feels like one continuous flowing space and it is this sense of connective space that brings the CABI 'family' together.

Internal environment

Using passive design to ensure the building has very low energy needs was a key issue. Internally the building is seen as a curved single volume space with an 'internal mezzanine' creating the upper floor, this gives connectivity between all areas creating an almost domestic sense of a home for the CABI family. This concept also allows air to flow naturally, entering via the external façade, after moving up through the building it rises into the top of the curve where it is collected in central plant.

In the summer months screened openable vents allow fresh air (scented by the wild flower landscape) to enter any point of the façade under the occupants control. This fresh air circulates around the first floor slab of exposed polished concrete (which is used for night purging with its cooling properties) to keep the building naturally cool during the Summer, and reduce the energy consumption, to embrace the aim of low carbon use in operation.

Exposed concrete soffits are complemented by the plenum floor system which can introduce cool air in the Summer tempering the overall temperature.

Space planning

Moving from a very cellular environment into an open plan setting was seen as a challenge to many staff members at CABI, careful selection of furniture settings, with screening elements and the use of biophilia was demonstrated using Virtual Reality, which dispelled fears and allowed this new form of occupation to be adopted. The result is a fully connected space which flows between floors and communal areas bringing a new sense of companionship and collaboration to the staff.

Natural light and views

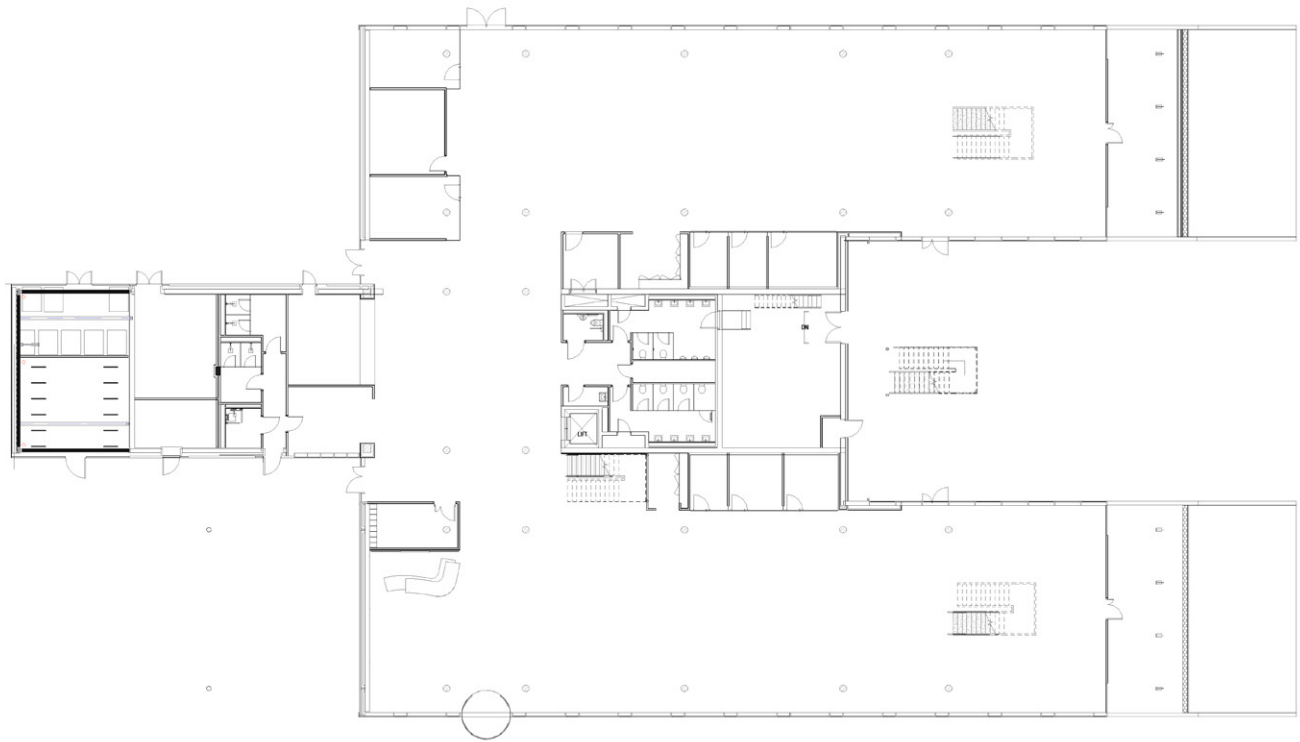
Space planning to allow maximum flexibility was a critical factor when designing the layout; future layouts were considered in-depth when analysing the design to maximise end user wellbeing, notably with daylighting. The design was based on density and in-use ratios against the amount of natural daylight received. Meeting rooms with a low in-use rate are positioned centrally within the central street and either use glazed partitioning or are open plan and orientated towards the perimeter glazing and the central atrium space. Areas with high in-use rates, such as open plan office areas are located to the perimeter. This maximises the potential of natural daylight and provides views of the Oxfordshire landscape and the surrounding parkland setting.

Materiality

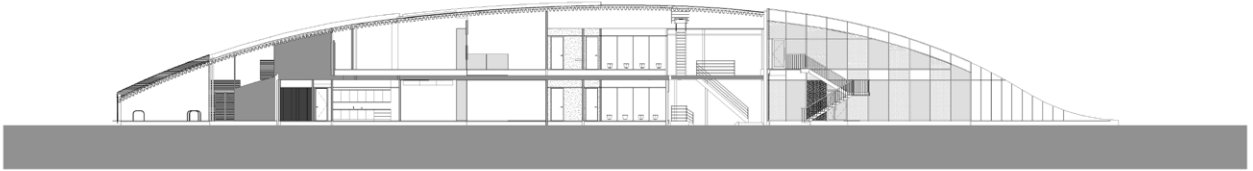
Materials were selected for durability and low maintenance, our goal was to use materials that would 'wear in rather than wear out'. Exposed polished concrete soffits and walls require no ongoing maintenance whilst giving a feeling of permanence and visual warmth. Alongside this the upper floors are constructed of exposed steel and visible ribbed decking soffits, these speak on honesty and utility.



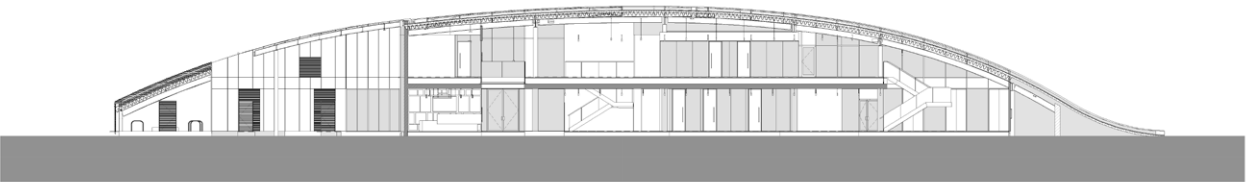




Ground Floor Plan



Section 1 through the Core



Section 2 through the office and reception

SUSTAINABILITY

Economic & Social Initiatives

Designing with passive sustainability as a priority, the building is positioned to minimise solar gains by being orientated East-West, this provides shade in the Summer and allows sunlight in the Winter.

Completing in 2020 means that the HQ foreshadowed the shift in priorities for office space users who, due to Covid-19, have placed increased importance on clean air.

Natural ventilation was a key design factor, and was achieved by a perforated façade, which permits cool air into the building throughout the day and night. It then rises up and is collected at the top. Heat recovery ventilation is used in the winter to pre-warm fresh air, which is then pumped into the floors. A traffic light system alerts users when the building gets too hot or doesn't have enough fresh air. It will prompt occupants to open their windows and increase the levels of fresh air in the building. It is designed to rely on communication and cooperation between the building and its users, rather than being heavily M&E driven, providing a natural, healthy and safe environment

Situated in an Area of Outstanding Natural Beauty, the building responds to its surroundings with a living roof, which will attract insects and birds and enhance biodiversity.

Sustainability & Climate Change

The use of a living roof has a number of key benefits:

- Reduce Solar Gain (by adding mass and thermal resistance value).
- Reduce summer cooling loads (by evaporative cooling) on a building by fifty to seventy percent.
- Increase thermal insulation during winter.
- Natural habitat creation.
- Reduce storm water run off.
- In Summer green roofs can retain 70-80% of rainfall and in winter they retain between 25-40%.
- Filter pollutants and carbon dioxide out of the air which helps lower disease rates such as asthma.
- Filter pollutants and heavy metals out of rainwater.
- Help to insulate a building for sound; the soil helps to block lower frequencies and the plants block higher frequencies.
- Increase roof life span.
- Green roof systems provide protection to roofing membranes from the effects of UV light and frosts, and therefore lead to a longer material life span.
- Fuel savings.
- Green roofs have a positive effect in terms of thermal insulation through their ability to cool buildings and insulate them during the Winter.





SCOTT BROWNRIGG⁺

scottbrownrigg.com