



Finalist's case study

University of Brighton & Fraser Brown MacKenna Architects

Built Environment Sustainable Refurbishment of The Cockcroft Building



University of Brighton

FraserBrownMacKennaArchitects 

Profile

- Higher Education
- 5 campuses
- 3 cities / towns
- 7 halls of residence
- 25,000 students
- 3,500 staff
- Urban

About the project

Summary

The retrofit of the Cockcroft Building is one of the largest educational sustainable refurbishments undertaken in the UK over the recent years. Our innovative design solution has unlocked the environmental potential of the building and enhanced this with the latest technology reducing energy demand, transforming it into a bright, flexible learning and research environment, fit for the information age, with 'learning labs' and agile workspace for staff and students.

Project partners

Faithful and Gould
Willmott Dixon Interiors
Curtins Consulting

ION Acoustics
CDMS Partners
Mott MacDonald Fulcrum

Burnley Wilson Fish
Fusion Fire Engineering

The results

The problem

In repurposing the Cockcroft Building at the University of Brighton, one of the largest retrofits of an occupied academic building in the UK, Fraser Brown MacKenna Architects were tasked with transforming a building designed for the Atomic Age into a research environment for the Information Age. The building was reaching the end of its useful life and this first opportunity for a wholesale refurbishment provided the chance to replace its outdated infrastructure and address issues of overheating, solar glare, high energy costs and complex way-finding as well as improve the building's fabric, which had battled against the corrosive maritime climate for half a century.

The approach

Fraser Brown MacKenna Architects sought to reduce energy demand and then to meet residual energy needs from renewable sources. The holistic architectural, structural and building services design has unlocked the hidden environmental potential of the building itself, with a new pattern of circulation and exposed thermal mass working in tandem with the latest technology that includes an Aquifer Thermal Energy Store.



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Our goals

The refurbishment of the Cockcroft building involved a major retrofit of a ten-storey building including replacement of external windows and complete demolition of all existing internal walls to create new, state-of-the-art teaching, research, and administration spaces including a new lecture theatre, teaching and research laboratories and new academic offices. Roofs and external walls were also upgraded beyond Part L requirements. The refurbishment also involved replacing all of the mechanical, electrical, and public health services, and installation of large scale renewable systems at roof level and underground.

Obstacles and solutions

The building remained in use throughout – one of the key challenges for the contractor Willmott Dixon Interiors, who were given access to only two floors of the building at a time. WDI implemented very strict rules about the hours in which the firm could undertake noisy activities and in 2015 were presented with a Considerate Constructors Scheme National Site Award (Gold) in recognition for hard work and effort made in raising the bar for considerate construction.

2,500 people in a 10,500m ² building	Full strip-out to open up the floorplate
Poor thermal performance	Circulation moved to a southern 'solar' corridor
Overheated cellular space and solar glare	Utilising the thermal mass of the building
Outdated building infrastructure	Building envelope enhancement
Outdated teaching and research labs	Renewable energy generation
High and rising energy costs	Aquifer Energy Store for heating and cooling

Performance and results

In repurposing the Cockcroft Building for the University of Brighton, one of the largest retrofits of an occupied academic building in the UK, Fraser Brown MacKenna Architects were tasked with transforming a building designed for the Atomic Age into a research environment for the Information Age. An innovative approach integrating architectural, building services and structural design has unlocked the environmental potential of the 10,500m² building and enhanced this with the latest technology, including an aquifer thermal energy store, potentially reducing energy demand, CO₂ emissions and fuel costs. We transformed the building from a dark, cellular and unloved space into a bright, flexible learning and research environment, fit for the information age, with 'learning labs' and agile workspace for staff and students.

The building now has an EPC 'B' rating, far in excess of what is required for a standard Part L refurbishment, and a considerable uplift on its previous 'F' rating. The University has been monitoring the performance of the large roof PV array and it is currently outperforming predictions, generating over 45,000kWh per year.

The future

Lessons learned

1. A transformational 'green' refurbishment benefits from high levels of staff and student engagement to realise the full benefits of the project.



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2. Having an explicit carbon reduction/energy efficiency targets at the outset drove the design and delivery of an energy efficient refurbishment of the building.
3. Undertaking research and exploring new approaches to energy efficiency, such as the ATES technology, at an early stage with stakeholders provides an opportunity for early engagement in the 'green' innovation drive of the project.

Sharing your project

The University of Brighton believe that the most effective way of developing our understanding of sustainable development is to focus on actions. This implies an on-going process of critical engagement in all our activities as an educational institution for future world citizens, as a centre of learning and research, as a major regional employer, and as a facilitator for knowledge exchange. The Cockcroft Building had remained occupied throughout the refurbishment with the contractor given access to only two floors of the building at a time; while lectures, teaching, laboratories and meetings continued as usual on all the other levels. Monthly events were organised by the Liaison Manager, who acted as the intermediary between Willmott Dixon Interiors and the occupants, collating any changes that were required as the project progressed; and acting as a single point of contact for our own stakeholders. Monthly staff and student walkabouts gave the chance to the people about to move back on the refurbished floor to have a look at it and give early feedback. Regular newsletters were produced specifically for stakeholders and residents, the latter being delivered locally. These included a specific section on environmental and waste management performance. A Twitter account had been developed along with information on hoardings, communication boards, etc for interacting with students and staff. The account has been very well received and used. WDI Management team had regular meetings with students including the Construction Department assisting students with their dissertations with some using the project as a case study. Site management had been engaged in staff and student briefings including lectures on delivering the project in BIM. In addition to working with our students contact had been made with the City College and local schools. Open door weekends were held together with a tour quiz with Samsung 'tablets' given as prizes. Students and apprentices from colleges were also provided with a mock interview service and assistance with writing CVs. Environmental, sustainability, quality and green purchasing policy documents together with site waste management plan were clearly displayed on notice boards and covered at induction. The UK has many university buildings constructed in the 1960s that are in urgent need of deep retrofit to improve energy performance and facilitate modern teaching methods. We believe this project can form a template to do this. For instance, Fraser Brown MacKenna Architects are currently working with the University of East Anglia to see how the iconic Teaching Wall could be retrofitted in the same manner.

What has it meant to your institution to be a Green Gown Award finalist?

"We have invested in Cockcroft to create an inspiring learning and working environment for staff and students, and I would be very honoured to receive a Green Gown Award on behalf of the project team as the recognition of the University of Brighton's longstanding commitment to be among the UK's greenest universities." Professor Andrew Lloyd, Dean of the College of Life, Health & Physical Sciences

Further information

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