



Building 591



NEW HARWELL BUILDING COMBINES SECURITY & SUSTAINABILITY

Designing a high security building is a challenging enough task; creating such a building to be operationally efficient, aesthetically pleasing, in harmony with its semi-rural setting *and* environmentally sustainable might be considered well-nigh impossible. The new Police and Emergency Response Team facility created by Research Sites Restoration Ltd (RSRL) on the Harwell site in Oxfordshire manages to tick all these boxes.

Replacing the police station and emergency response buildings that dated back to the 1940s, the new facility brings together the forces of Harwell's Civil Nuclear Constabulary (CNC) and Emergency Response Team (ERT – which combines fire and ambulance services) under one sweeping aluminium roof.

Designed by architects BHP Harwood for RSRL and funded by the United Kingdom Atomic Energy Authority, the project was managed from inception by Blacknall Ltd and constructed by Mansell Ltd.

“ Faced with a complex set of potentially conflicting demands, RSRL and our partner companies in the design and construction teams have worked hard to achieve the result we wanted: an attractive building that meets security and operational requirements with sustainability and sensitivity to setting and purpose. We believe we've created a striking result that enhances the site and is a pleasure to work in. ”

John Evans, RSRL



OVERALL CONCEPT

The design philosophy was, first and foremost, to create a highly secure building that would provide a modern, congenial working environment for the police officers and emergency response teams to operate from. The building had to accommodate a full range of specialist operational duties within a pleasant environment, while also incorporating commercially viable, environmentally-friendly technologies.

BHP Harwood's principal designer, Stephen Johns, takes up the story: "The building design combines two separate entities under a single sculptural roof form that unites and provides homogeneity to the overall composition.

"The internal layout is arranged around a central spine circulation space that features a continuous coffered ceiling naturally lit with sun-pipes. This corridor terminates in a two-storey oriel window that provides a positive architectural statement as one approaches the building."

HISTORY

Since the 1940s, the police operational unit had been based in an old RAF guard room situated near the main road at the front of the site. In recent years, an intense decommissioning and demolition programme has been under way at Harwell to clean up the site, allowing for the redevelopment of part of it into a world-leading science and innovation campus.

As the clean-up project has progressed, the footprint of the nuclear licensed site has been reduced, enabling the boundary fence to be moved back from the road. This made it necessary to relocate the police and emergency response

facilities to keep them within the secure zone. With no suitable existing building available for adaptation, it quickly became clear that here was an opportunity to create an entirely new and unique building.

DESIGN TEAM

RSRL put together a design team of firms from within Oxfordshire; some of them based only a few miles from the Harwell site.

Following a brief that not only exceeds the latest 2010 building regulations but also the stringent requirements of all other relevant regulatory bodies – including the Home Office – the design team came up with a concept that fits with the building's current highly specialised functions while offering sufficient in-built flexibility to cope with any foreseeable future requirements.

“ Working closely with the architects and the other members of the design team, as well as with the occupants and other stakeholders, we planned the layout carefully to facilitate workflow through the one-storey building – from the operational centre, training rooms and admin areas to welfare facilities, locker and mess room and then on to the gym and vehicle bay – in a way that is coherent, logical and efficient. ”

Dan Bowerman, Blacknall

ENVIRONMENTAL FEATURES

Attention to detail is a hallmark of the design, especially when it comes to maximising its environmental credentials.

“The entrance is a case in point, where a louvred brise soleil in reclaimed oak makes a bold statement, while performing the very practical function of reducing solar gain in the reception area,” explains Dan Bowerman. “It neatly and stylishly marries form, function and sustainability, something we have endeavoured to do throughout the structure.”

At every stage of design, life cycle costs were considered, taking account not only of the cost of construction but also of maintenance and running throughout the building's lifetime.

A robust, heavily insulated, sustainably sourced timber-frame construction was chosen as a cost-effective, environmentally sound, yet flexible solution. This technique delivers substantial time and cost efficiencies, as well as giving flexibility of use.

Internally, the facility showcases innovative ‘green’ technologies, chosen to be not just environmentally friendly but also commercially viable. All of them help control energy consumption and reduce carbon emissions, ensuring that the overall running costs of the new facility are substantially less than for the previous accommodation.

An under-floor heating and cooling system captures energy from the soil via a ground source heat pump. The ‘always available’ nature of the system matches perfectly with the 24-hour nature of the building's working life. Though more expensive to install than a conventional system, the payback period is relatively short. In addition, heat from the building's shower rooms is captured, recovered and pumped back into the system. Back-up heating, if required, is provided by a gas-fired boiler which was recycled from a redundant building on the site.

The generous use of sun pipes ensures a high level of cost-free daylight distribution. These, together with floor-to-ceiling windows in many of the rooms, flood the building with natural light, making this a very pleasant working environment. There are no light switches to be left on in this building: motion sensors linked to the lighting system throughout help to keep down electricity consumption.

In place of energy-hungry air conditioning, the building's designers have opted for a passive ventilation system. Air is drawn in through external terminals on the roof and, regulated by computer controlled ceiling louvres, introduced into the rooms when needed. A harvesting system collects rainwater from the roof. This is filtered, stored in tanks and used for flushing the WCs, leading to a further reduction in utility bills.



AESTHETICS

The special nature of the building means that it has to be highly secure but this has not been allowed to overwhelm the design concepts. Efforts have been made to accommodate security features as unobtrusively as possible within the structure. Strong, secure and bristling with technology the building may be but – in outward appearance at least – it doesn't look like a fortress.

Instead, the semi-rural nature of the locality has been reflected in the materials chosen, allowing it to sit comfortably in the rolling Oxfordshire countryside.

The building's twin functions are separate but joined by a shining milled aluminium roof perimeter, flanked at each end by lime-rendered external walls.

The majority of the external walls are clad in maintenance-free, fire-treated cedar shakes – a theme which wraps around into the reception area, emphasising the two separate entities here. The shakes – which have rough, split faces rather than the more usual, smoother shingles – will in time weather to an attractive silvery colour.

BHP Harwood's Stephen Johns explains further: "Simple but well-proportioned barn-like forms were used as the architectural design model to reflect the wider rural context. The deliberately limited palette of materials heightens this effect – the walls are clad with cedar shakes or lime render through which the contrasting fenestration pods project. The milled aluminium roof provides a striking "leading edge" that appears to float above the building that sits over locally sourced stone-filled gabions.

"The effect is a stimulating modern building with inherent sculptural qualities, yet with an indigenous grounding through form and materials."

The overall composition provides a dramatic statement for an evolving site that demonstrates RSRL's commitment to the environment both aesthetically and in delivery.

As well as the gabions filled with local stone, a 'Golpa' reinforced grass surface surrounds the building, providing secure vehicle access for maintenance purposes, without the need for ladders and external stairways, which could compromise security.

External landscaping has been carried out with the environment very much in mind, using material excavated from the site. None of the arisings were exported from the site. Instead they were reused, some to form the screening bank round the building, which will soon be landscaped with a varied planting scheme consisting of a selection of native trees and shrubs.

AWARD-WINNING

“ The CNC/ERT building project is a key part of the pioneering programme to decommission and re-develop the Harwell site. It was a demanding and ambitious undertaking and its successful completion – on time and within budget – is a tribute to the skills and determination of all the parties involved. I'm doubly pleased that this success has now been recognised by RoSPA, who have given RSRL a highly commended award. ”

John Evans, RSRL



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SPECIFICATIONS:

Client: RSRL

Project manager

Dan Bowerman of Blacknall Ltd, Wiltshire

Principal designer

Stephen Johns of BHP Harwood, Wantage

Main contractor

Mansell Construction Services, Slough

Mechanical/electrical engineering

CBG Consultants, Farmoor, Oxford

Civil and structural engineering

AKS Ward, Oxford

M&E Sub-Contractor

Scion Ltd