

# Well worth waiting for

After 100 years of patience Brighton finally has a new library. Built on environmentally sustainable principles Brighton & Hove City Council wanted to ensure it was worth the wait. *Sara MacLean* takes a look

**G**ood things come to those that wait. It was back in 1902 when the last Brighton library opened in converted rooms within the Brighton Dome complex adjoining the Brighton Pavilion. The city outgrew these premises, however, despite this and promises of a new library back in the 1970s it has taken until March this year to pro-

duce a worthy alternative.

Now the library is here it has proved to be well worth waiting for. The £14m Jubilee Library is a landmark building and the focus of a new city square. The building is Brighton's first truly purpose-built central library. It houses approximately three times as many books as the previous main library, twice as many children's books, five times the number of books for

teenagers and more than twice as much audio-visual material. There is also five times more study space.

The library is part of a £50 million PFI regeneration scheme with Jubilee Square set to transform a large derelict site (1.75 hectares) into a vibrant space for contemporary urban living with a mixture of retail, leisure, hotel, office and residential facilities.

After such a wait it is not surprising Brighton & Hove City Council was determined that every aspect of the library should be delivered to the highest standard and that the design brief should be built on environmentally sustainable principles.

David Selvage, an associate at building services and environmental engineers Fulcrum Consulting, explains: "As a PFI



project the initial briefing was very clear. Brighton & Hove City

Council wanted an environmentally sustainable approach. In



the briefing there was some flexibility in the design. However, we set out from the offset to build a low energy building."

Historically, architecture and building services have been separate disciplines, the services compensating for the technical limitations of a building. In this project, Bennetts Associates, architects, and Fulcrum Consulting have shared aspirations and have worked closely to strive to produce one of the most energy efficient buildings in the country.

Fulcrum Consulting maximised the 'passive' input into the services by making use of the natural energy generated by the coastal setting, taking best advantage of natural light, solar warmth and sea breezes. This has minimised the use of powered services such as electric and gas heating and artificial air conditioning, which also reduces maintenance.

However, key to taking advan-

tage of the natural energy is the building fabric. The library is a building with a high thermal mass: a heavy concrete structure, with high levels of insulation on roof and walls dividing the interior from the exterior. Such a building is capable of storing either heat or coolness to suit weather conditions.

"It is important that people understand to take this approach is very holistic, you have to look at the building fabric, it has to work thermally, you have to work with the architect. Building services usually makes up for the shortcomings of the building fabric," says Mr Selvage.

Les Becker, mechanical services director from mechanical services contractor, Halsion agrees that if "the building structure is not correct the required efficiency won't be reached. From the building side it needs to be constructed to a higher standard."

The storing of heating and cooling within the building fabric is achieved through extensive use of Swedish TermoDeck concrete ceiling slabs on the galleries surrounding the main hall. These contain hollow tubes through which air can be pumped. In summer, low temperature night air is used to chill the concrete, therefore cooling the building by day.

Conversely in winter, heat from sunlight through the massive south-facing glazed front wall, (and generated by people,

computers and machines), which would otherwise be wasted is stored in the concrete and used to heat incoming air.

It is the ability to gently trickle heat into the building via the TermoDeck that Mr Selvage says attributes to the building's impressively low gas use over the last winter. He explains that perimeter rooms are arranged at the edge of the building and act as 'radiators' for the main library area which is treated as one large room. This results in the main library being a degree cooler than the perimeter rooms. Although Mr Selvage reassures us that the main library has still reached 21-21.5 deg C in the depth of winter.

To prevent overheating from solar gain, slatted louvres behind the glass south wall provide shade from high-angle sun in summer, while allowing through warmth from low-angle rays in winter.

While ventilation is enhanced by three 15ft conical high wind towers on the roof. Using the same principle as oast houses drying hops, passing sea breezes create a 'venturi effect' sucking out warm air through the building's roof.

According to Mr Selvage the wind towers allow extract fans to be turned off while roof lights can also boost ventilation. Mr Becker adds that there are also opening windows situated around the building which like the induction turrets are controlled by the BMS. The BMS system reads building temperatures and adjusts the ventilation accordingly whether via the windows or the wind towers.

Through these passive systems mechanical cooling and heating is kept to a minimum. Mr Selvage says: "Compared to traditional projects it has a very lean, simplistic mechanical system."

There are two air handling units to service the whole building with a 50/50 split between perimeter rooms. They heat in winter and use night time air, when appropriate to cool in the summer.

Mr Becker explains: "There are two gas-fired air handling

## Key players

**Client:** Brighton & Hove City Council

**Developers:** NUPP Fund managed by Morely Fund Management and asset managed by Mill Group, investor, developer and operator

**Architects:** Bennetts Associates and Lomax Cassidy & Edwards

**Building contractors:** ROK

**Building services and environmental engineers:** Fulcrum Consulting

**Mechanical services contractor:** Halsion

**Facilities management:** Kier Support Services

**Bibliographic services:** Cypher

units that heat the TermoDeck and cool it. However, any available cool night time air is used before operating the chiller."

As well as a chiller providing chilled water to air handling units there are also some local

split air conditioning units that are chassis mounted, built to fit the architect's frame. The split systems are used in seminar rooms and hot spots around the library. These are all

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## The library exterior

The library is set in its own space in the centre of the Jubilee regeneration site development. This has enabled the architects to achieve a building that is uncompromisingly modern, but not overstated. It can be judged on its own terms, avoiding clashes with, or comparisons to, surrounding historic buildings. A café pavilion adjoining the library forms the east flank of a public square (20 x 30m).



The architecture of the 5,000 sq m library has a stature and presence. An outstanding feature is its magnificent glass south-facing frontage, which links the inside and outside space, tempting people from the public into the library. The large west wall is clad with thousands of dark blue and green hand-glazed ceramic tiles, recalling the 'mathematical' tiles on many historic Brighton buildings. Wind-towers on the roof contribute to the Brighton skyline, identifying the library from surrounding viewpoints.



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controlled by the BMS system. However, despite this use of powered active cooling Mr Becker says an environmental refrigerant was chosen to run it with the chiller and the split systems using HC propane in the form of the CARE 40 System. HCs were chosen instead of HFCs specifically because of the library's environmental design.

According to Mr Selvage the chiller and air conditioning units were included in the specification as a response to the PFI contract that stipulated an upper temperature limit of 26 deg C. He describes the chiller's addition as "disappointing" since he estimates the library would only reach high temperatures of 27-28 deg C for about 10-12 days a year.

"PFIs are difficult because of the strict performance criteria. By nature a contract is rigid. If you have more freedom, you tend to offer design options more dynamically – with end-user acceptance of operations exceeding temperature limits for so many days of the year. But, PFI defines the design. They are very restrictive – personally with a bit of



freedom I would have considered taking out the chiller," adds Mr Selvage.

From the mechanical contractor's point of view the most challenging part of the project

was the controls. "Fortunately we worked closely with the controls company but from a design point of view the passive control of the windows and turrets was the most challenging part of the project," explains Mr Becker. The difficulty involved ensuring the passive ventilation strategy was correct and worked harmoniously with the TermoDeck system. However, the challenge did not end there since Halsion then had to make control adjustments for the building working in practice.

Despite the complexity of setting up the controls the building is now benefitting from them. Sandra White, PFI project manager at Caxton Facilities Management, part of the Kier Group, says that from a facilities management point of view the BMS is easy to use especially since all the controls are in one area.

However, it is still too early



## Jubilee site regeneration scheme

A major Private Finance Initiative (PFI scheme) in central Brighton is regenerating the entire Jubilee site with a £50 million venture, which includes the Jubilee Library. This scheme, one of the most ambitious and innovative of its kind is transforming a derelict area, mostly vacant since the mid-20th century, into a city square that will provide excellent facilities for the public.

Brighton & Hove City Council was given permission by the Treasury to appoint Mill Group to deliver the project. The company's core business is developing and operating Private Finance Initiative (PFI) schemes across the UK.

Few public buildings of the calibre of the new Jubilee Library are now constructed. This landmark building costing £14m has been the catalyst for the other elements of the regeneration, attracting investment into the surrounding area: a boutique hotel, shops, restaurants, offices and private and social housing, and, within the library itself, a high quality café-restaurant and a retail unit. The maintenance of the Jubilee Square will be paid for by the owners of the surrounding buildings.

Receipts generated by the sale of parts of the site, to independent companies including Larrik Properties for retail, office and restaurant units, and myhotels for a boutique hotel, have subsidised the cost of the library. Without this arrangement, the funds necessary for such a fine building would not have been available to Brighton & Hove City Council.

Under PFI, the new library has been built with funding from NUPP a limited partnership between Morely Fund Management and the Mill Group. They are leasing it to Brighton & Hove City Council for 25 years and will maintain the building during this time, after which the city council will own it. During the lease period, Kier Support Services are providing the facilities management for the library.

## The library interior

The interior is a simple rectangular plan with three floors. The ground floor and upper floor library halls are both double-height spaces: lofty volumes, constructed from two rows of vaulted structures, supported on tall columns. Three single height, flexible perimeter spaces, for book storage, library activities and specialist functions wrap around these central areas in a u-shape, on three sides. These are galleried spaces overlooking the floors below.

The ground floor contains adult fiction stock, a young people's section, children's library, audio-visual library, exhibition area, 'book lovers store' and a café-restaurant. The mezzanine floor, at first floor level, has staff offices and a conference suite. The top floor is a 'floating' floor, linked by bridges to the perimeter accommodation, allowing light to flood from the roof-lights above to the ground floor below. It is the main reading area with information and reference stock. Here are housed the library's extensive special collections of historic publications and documents previously not accessible to the public. This section has a more traditional library feel. The perimeter accommodation includes a large computer suite.

to discover how energy efficient the building is proving to be. The design has been rated as 'excellent' for environmental friendliness by the Building Research Establishment, which bodes well for the future. But, according to Mr Selvage: "We won't know for sure for a cou-

ple of years following feedback data." During the interim the occupants and facilities management company will have to learn to work with the building in order to achieve its best performance. Although, Mr Selvage adds: "Early indicators are encouraging since the gas

used over the winter was impressively low."

Now only time will tell if the Jubilee Library will live up to its low energy principals. However, after waiting for such a long time for a new Brighton library, it will now definitely be worth the wait.