Refurbishment Resource Efficiency Case Study: Elizabeth II Court, Winchester

1960s Council Office Building

A demonstration of the major resource, carbon and cost savings which can be achieved by selecting refurbishment over new build

Key Business Benefits

- Retention of the concrete frame saved 50% of the embodied energy normally required to construct a building.
- 70% increase in staff occupancy through more efficient use of space.
- Total Council building stock reduced by 30% helping reduce overall running costs.
- £40 million saved by choosing refurbishment rather than new build.

Project background

Elizabeth II Court is Hampshire County Council’s head office based in Winchester City Centre. The former harsh 1960s concrete office was refurbished between early 2007 and summer 2009 at a cost of £40 million.

The building was completely stripped out with only the concrete frame being retained. It was then re-clad and remodelled to create a flexible open plan, naturally ventilated modern office space.

"Elizabeth II Court’s environmental credentials are exemplary and it represents a clear example to other public bodies of what can be achieved with sustainable and creative reuse”

Councillor Ken Thornber, Leader of Hampshire County Council

New build v refurbishment

When the Council was assessing options for the building they considered 3 options:

1. Minimal repair and replacement of selected elements (£15 – 20 million)
2. Demolish and new build (£75 – 80 million)
3. Major refurbishment (£40 million)

To leave it in its existing state was not really an option as it was an inefficient building that was hot in the summer and cold in the winter, doing nothing for the health and wellbeing of occupants. Elements in need of urgent upgrading or replacement included the roof, interior fittings, lifts, electrical systems and drainage. However, with a full rebuilt discounted as too expensive, refurbishment was therefore selected as the most practical and cost effective method for giving this development another lease of life.

Hampshire County Council has a reputation for excellence in the built environment and it wanted to ensure the head office was transformed into a flagship building. They had high expectations of their private sector project team and set the following objectives:

- Be highly sustainable in every possible regard, with a particular emphasis on resource efficiency.
- Enable the Council to introduce flexible working methods and make more efficient use of its assets.
- Act as an exemplar for the Improvement and Efficiency South East procurement framework
- Deliver within tight budgetary and programme constraints.
- Reduce the County Council’s office portfolio to enable funds to be directed to front line services.
Embodied Carbon

By opting to refurbish the building and reusing the existing concrete structure the project team calculated an embodied energy saving of 50% compared to a new build project (used the BRE’s Envest II software). In addition, they prioritised local sourcing, including bricks that were made only 5 miles from the site and a local timber window system to reduce the embodied carbon even further.

The contractor also put in place targets and monitoring processes relating to a number of resource efficiency key performance indicators during the construction phase. For example onsite fuel, gas and electricity consumption were recorded with an overall project target of maximum 720 tonnes CO₂e from these sources. BAM Construct, the main contractor, easily achieved this target.

Water use

Project water consumption was also recorded with the overall maximum consumption for the project targeted at 4,000m³, which was also achieved. Monthly consumption figures were displayed on site to help identify where additional savings could be made.

In terms of operational water use, the Council’s plans for rainwater harvesting and greywater recycling could not be followed through due to a lack of suitable space. However, to ensure that consumption was reduced significantly, water saving devices were installed in the toilets and washrooms. As a result, whilst the occupancy of the building nearly doubled water use has not risen significantly.

Materials quantity and waste

Retaining the concrete structure not only provided embodied energy savings but also avoided a significant amount of waste: 93% of the primary structure was retained without the need for any significant strengthening works.

All demolition materials were recycled including former pre-cast concrete cladding panels which were crushed off-site and re-used as aggregate in other local projects, significantly reducing the amount of waste being sent to landfill.

Materials specification

The majority of new materials used in key building elements were procured with reference to the Green Guide to Specification. 100% of the external walls (total area 4,467m²) and 100% of the upper floor slabs (total area 8,738m²) were reused.

The building has a concrete facade which is broken up by the external air ducts. These ducts are clad in locally sourced brick to help the headquarters blend in with Winchester’s red-brick terraces.

Scarcity & security

All timber on the project was sustainably sourced with full chain of custody provided as part of FSC or PEFC certification. This included temporary site timber.

Life cycle considerations

Refurbishing the building meant the lifespan was increased by at least another 40 years. The design team prioritised flexibility to ensure adaptability for additional/ alternative uses in the future.

By refurbishing the existing building the Council was able to increase office space to accommodate an additional 500 staff (taking the total to 1,100). By incorporating additional staff into Elizabeth II Court, the Council was able to reduce the amount of office space required by 4,500m², contributing to significant reductions in energy consumption per desk space.

Increasing capacity has also reduced maintenance liabilities associated with additional buildings, freeing up more funds for essential frontline services.
In addition, operational carbon emissions were reduced from 90kg to 43kg CO$_2$/m$^2$/annum in year 1 - a reduction more than 50% (and the equivalent of 200 average UK households). However, as a result of staff training and awareness raising, this is now down to an impressive 28.05kg CO$_2$/m$^2$/annum, equivalent to the performance of new-build sustainable offices in the UK.

**Awards**

The project has won a range of sustainability awards, including:

- Building Council for Offices Award Recycled / Refurbished workplaces (Regional).
- RICS Award 2010 - ‘Sustainability’ – South East Region.
- Building Awards 2009 – ‘Sustainable Project of the year’.
- CIBSE Award 2011 ‘Refurbishment Project of the Year’.