

ELIZABETH II COURT LOW CARBON REFURBISHMENT, WINCHESTER



Retrofit



Design

A CASE STUDY



Elizabeth II Court in Winchester provides a benchmark for the refurbishment and retrofit of concrete framed structures popular in the 1960s that are now environmentally inefficient and highly unpopular with occupants and the general public. This refurbishment project involved retaining the concrete frame and remodelling the building in a £40 million refurbishment that is saving £200,000 a year in running costs, promises reductions of 70% in carbon emission levels, and has been part of a revolution in working practice for Hampshire County Council and its staff.

Key features

- Existing frame's thermal mass acts as a heat sink in daytime, contributing approximately 25W/m² of additional cooling.
- A natural wind driven ventilation system. The building incorporates ventilation ducts to draw air out and wind troughs at the top to create negative pressure (suction). A building management system controls air movement, but lower windows can be operated manually by occupants.
- Minimisation of cooling loads by optimisation of façade design to balance daylighting, solar gain and airtightness. As a result, glazing ratio on main courtyard and street facades is kept below 40%.
- The data centre uses conventional down-flow air-conditioning units, but they are modified to use fresh air when external temperatures and humidities permit.
- Intelligent lighting linked to daylight and movement sensors.
- Existing precast concrete façade has been crushed and recycled. The development has been re-clad in timber/aluminium composite cladding with brick on the outer facades.
- Culture change with new ways of working and flexible use of space.

Project outcomes

- Carbon emission reduction of 90kgCO₂/m²/yr to a target level of 39kg CO₂/m²/yr. Over time, the project team believes the building could achieve 30kg, a 70% reduction.
- 70% reduction in energy use, on a like-for-like basis, relative to new build.
- 30% space utilisation improvement leading to eventual 4,500m² reduction in county council office space requirement.
- £200,000 annual saving in running costs.
- 75% more staff occupying the refurbished accommodation (up from 625 to 1,100 staff) due to creation of more space and flexible working practices.

Elizabeth II Court is a strong example of a project where it can be more effective to reduce energy input than to simply rely on renewable energy options. Collaborative working was central to the successful delivery of the project on time and budget. Hampshire County Council is a leader on the Improvement and Efficiency South East construction and asset management workstream. The project achieved a BREEAM Excellent rating and is being monitored is now being repeated on the refurbished building.

The organisations involved in the project include: architect Bennetts Associates, project manager Mace, cost consultant Davis Langdon, M&E engineer Ernest Griffiths, structural engineer Gifford, main contractor BAM, town planning consultant Colliers CRE, low carbon advisor the Carbon Trust, and project evaluation Arup.