

CHILLED BEAMS

Cool down to meet workplace demands

Andrew Jackson, Director, SAS International, explains how chilled beams can meet the ever increasing demands of the modern workplace to meet property developers and tenant demands for comfortable and energy efficient surroundings.



The UK Population is predicted to grow by 4.3million from 2012 to 2022, according to the Office for National Statistics. As cities and therefore the workforce grows, non-domestic buildings are taking on more requirements than ever before to cater for the variety of business needs, from flexible office space through to achieving sustainability accreditations. Occupant comfort and energy efficiency are main drivers as attitudes shift to recognise that a comfortable and energy efficient office can pay dividends in the long term.

Occupant Comfort

Demand for long-term value is coming to the fore with occupant comfort increasingly being recognised as enabling productivity in the workplace.

Ensuring staff and end users of commercial buildings are happy and healthy is important as 90% of typical company expenditure is on staff compared to 1% on energy and water bills, as reported by the British Council for Offices (BCO). Lighting, acoustics, office furniture, temperature and air quality are all major factors to contribute to occupant comfort.

BCO published a report 'Improving the Environmental Performances of Offices' which identifies occupant satisfaction as a key driver for productivity. This is echoed in the WGBC's (World Green Building Council) 'Business Case for Green Building' which shows a change in attitude realising occupant comfort helps improve



Balancing architectural vision with M&E demands can be met with the use of chilled beams. Integrated Service Modules (ISMs) integrate lighting and additional services with a passive or active chilled beam into an architecturally designed metal casing. Accommodating ventilation, heating, cooling, lighting, fire detection, lighting control, acoustic, sprinkler and other building services, ISMs are generally suspended from a soffit which can remain exposed to utilise additional cooling from thermal mass of concrete structure.



productivity but 'green' buildings can also help influence this through their considered designs and measured performance. The report also showed from several case studies, that productivity improved by 3% where staff could control temperature themselves.

A number of factors lead to the choice of chilled beams and ceilings. These solutions radiate cooling downwards and provide quiet, draft free comfort cooling to occupants.

At the prestigious Strand Campus building for King's College London, active chilled beams were installed in 75 cellular offices, allowing academics local control of the temperature via separate wall mounted thermostats. Chilled beams can allow occupants to control the temperatures and have different chilled zones where occupied.

Not only can chilled beams enhance occupant comfort, they also have potential to save 22% of energy compared to a VAV fan coil. In 2013 the EDSSL TAS Energy study conducted in collaboration with the Chilled Beams and Ceilings Association (CBCA) revealed the results of a study into Annual Plant Energy Cost Comparison, which showed a 17% saving for passive chilled beam systems and approximately 22% for active chilled beam systems.

Heat transfer medium

Chilled beams use water, as opposed to air or refrigerant, as the heat transfer medium. This type of system helps to reduce energy usage due to the system's comparatively high operating temperature of between 14C and 17C, as well as the ability to set up separate cooling zones, ensuring only occupied areas are cooled.

Chilled beams can be combined with technologies such as free cooling and ground sourcing to increase their energy efficiency even further. By opening up the soffit, the units also allow free air movement to the soffit for sustainable nature mass cooling. As a result the use of active chilled beams can help achieve high Energy Performance Certificate, Display Energy Certificate and BREEAM Methodology ratings.

Reducing operating costs of buildings remains a primary driver of retrofit activity, whilst with new build, energy efficiencies can be taken into account from design stage.

Architectural vision

Balancing architectural vision with M&E demands can be met with the use of chilled beams. Integrated Service Modules (ISMs) integrate lighting and additional services with a passive or active chilled beam into an

architecturally designed metal casing. Accommodating ventilation, heating, cooling, lighting, fire detection, lighting control, acoustic, sprinkler and other building services, ISMs are generally suspended from a soffit which can remain exposed to utilise additional cooling from thermal mass of concrete structure.

In the case of Wakefield One, over 2,850 linear metres of passive chilled beam ISMs were specified as they could incorporate MPO luminaires, provide cooling and acoustic absorption for office areas. The architects also wanted the benefit of an exposed soffit for height and thermal mass to absorb heat during the working day. The solution of chilled beams with an ISM included all these diverse elements but still provided an elegant finish. Being able to meet these increasing demands within modern and energy-efficient workplaces makes chilled beams ideal solutions.

Wakefield One features a mix of facilities including museum, café, library, Wakefield Metropolitan District Council One-Stop-Shop and civic offices, arranged around a public atrium. The entire project takes a holistic view of sustainable design so that structural, environmental and architectural elements all contribute in providing a low energy BREEAM 'Excellent' solution which aims to produce 30% less carbon than a conventional comfort cooled office.

Long-term value

With the EDSSL TAS Energy study highlighting the energy saving benefits of chilled beams, this technology has proved itself as a key choice to deliver long-term value, as well as providing a comfortable interior environment, which in turn can help boost workplace productivity.

www.sasint.co.uk

