Commercial Case Study

BT - Sevenoaks

Trend building management systems have been installed in over 500 of BT's premises, including most of its new 'Workstyle' electronic offices. The telecommunication giant's choice of Trend's accessible and future-proof technology is consistent with the company's whole-life cost approach to the design of its Workstyle buildings. One of the latest systems to go in was engineered by Coulsdon-based Lloret Control Systems Ltd and provides energy efficient control of both the HVAC plant and lighting in 134,000 ft2 of newly built office space in Sevenoaks. BT decided against a separate, dedicated lighting control system, believing it would add cost and complexity for no real benefit.

BT's Workstyle buildings provide flexible, high quality office accommodation at sites around the M25 motorway and in provincial city centres. Sevenoaks is among the last to be completed and comprises three-floors of mainly open-plan workspace for some 1200 occupants. Project and construction management was by Exterior International Ltd and Roberts & Partners were the building services engineers.

Located in Sevenoaks town centre, close to a rail line, the offices are fully air conditioned. However, like all the Workstyle premises, it is an energy efficient building (it has a BREEAM rating of 'very good'). In common with the other sites its building services are also designed with maintainability in mind and have the flexibility needed to allow for future changes in office usage.

Conditioned air is supplied to all floors by a displacement ventilation system, which is served by four air handling units. The air enters the space via floor grilles at a minimum of 19oC, which enables maximum use of fresh air for free cooling. Unusually, air returns to the roof top plant via atriums at the front and rear of the building, obviating the need for return air ductwork. The simplicity of the whole arrangement means the risk of problems occurring is low.

The SW-facing rear façade of the building features an inner and outer glass wall. In the winter, the 2m air gap between the walls acts as an insulating layer that minimises heat loss. In warm weather, an air flow is induced and heat removed via high level windows. Heat gains are further mitigated by solar shading. As the front façade of the building is also extensively glazed, much of the office space enjoys a high degree of natural lighting.

Through its networked IQ controllers the Trend BMS controls and monitors all elements of the HVAC plant, including boilers, chillers and air handling units. It modulates the AHUs and ductwork dampers to maintain space temperatures at 21oC +/- 2oC and RH at 50% +/- 5%. The air gap in the rear glass façade is controlled to 26oC, by the system opening and closing low level louvres and the high level windows. The AHU fans and heating and cooling circuit pumps are fitted with variable speed drives, which should result in significant power savings. To match the volume of air being removed from the space with the amount

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going in, the speed of the extract fans 'tracks' that of the supply fans.

A number of the building's meeting rooms have fan coil units, each of which is equipped with a small, factory fitted IQ controller. Underfloor heating in the front atrium and a trench heating circuit are also under the system's control.

On each floor, the main lighting is divided into interior, dimmable and perimeter zones. The interior lights are just time controlled. The others are enabled during occupation hours and then controlled in accordance with photocell readings, being dimmed or turned off as natural lighting levels increase. A few minutes before the end of the occupancy period the lights 'blip' to warn that they will shortly be switched off. Occupants then have the option of keeping the lights on (for a pre-set time) using switches in the stairwells. All lighting control functions are performed by IQ251s, the same units also controlling the air conditioning ductwork dampers.

As part of its extensive monitoring role, the BMS measures the building's total power, gas and water consumption, as well as taking readings from six electricity sub-meters (two per floor). One reason the sub-meters have been installed is to achieve advanced compliance with anticipated revisions to the Building Regulations (Part L). The energy data will be very useful to Monteray, the FM company that BT has appointed to run the building and whose contract involves penalty payments if energy usage targets are not met.

The BMS's main operator interface is a '962' supervisor, which BT specified partly because it facilitates remote monitoring via the Internet.

To BT, an important feature of Trend controls is their backward compatibility – ie, new generations of equipment are designed to be easily integrated into existing systems. This obviously serves to limit whole-life costs. So to does the existence of a well-developed network of accredited systems houses able to engineer and maintain Trend installations, which they do using standard software tools.

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