

# Sustainable Construction

## WINNER

### Doing up the Strand - Sustainable Refurbishment at King's College, London

Since its opening in the 1830s, the listed King's Building has been modified many times. Refurbishment of an 8,800m<sup>2</sup> wing - much of it unoccupied because of poor condition, and relocation of previous users - became a priority in 2002. The conventional solution, according to Director of Estates, Ian Caldwell, "would have been to accept the modified structure, and to modernise its services, including installation of a central air conditioning system. However we wanted a sustainable solution to make the building more attractive to users and the community, and also to reduce or contain energy and other operating costs."

The solution was removal of accretions such as mezzanine floors, book lifts, and partitions, and consolidation of services into 'micro-risers' in the main corridors. This allowed restoration of the more open spaces, higher room volumes, and greater window area of the original design, and enabled high use of natural lighting and ventilation. Re-establishing a visual relationship between circulation spaces and staircases also reduced lift requirements.



Anti-glare shutters in a King's Building teaching room

Other measures to restrict air conditioning to a few specialist areas include opening windows and ceiling fans, purpose-designed internal shutters to control solar gain (and provide better light control for presentations), and renewal - with insulation - of the double-storey slate roof to reduce summer solar gain (as well as heat loss in winter). Integral rooflights also bring natural light into the heart of the building.

Additional sustainable features include an 80% recycling of demolished materials, 100% use of FSC certified timber, occupancy sensing control of lighting and urinals, and an advanced building energy management system.

Feedback on the building has been very positive, especially after training about its features. According to Energy Manager, Keith McIntyre, the "energy benefits are enormous. Even with more usable space, annual electricity consumption is down 18%, and gas by 11%. This has saved £96,790 a year, with little if any additional capital expenditure needed to achieve it."

#### Judges' Comments on Sustainable Construction

*"Refurbishment is a topic of growing importance. Much of the sector's estate is in poor condition, and financial pressures require maximum use of existing space (which is also environmentally beneficial). The renewal of the King's Building shows that - by simply doing the right things - this can be achieved in a very sustainable way. The considered quality of the design, and the efficient delivery in practice, is most impressive. In particular, the imaginative decision to remove the many retrofits which occurred over previous years has both optimised the use of natural ventilation and day-lighting, and restored the College's heritage. The 80% recycling or reuse of wastes was also a major achievement, which required very thorough record keeping. The end result is a revitalised nineteenth century building with an interior that meets all the requirements of third millennium higher education."*