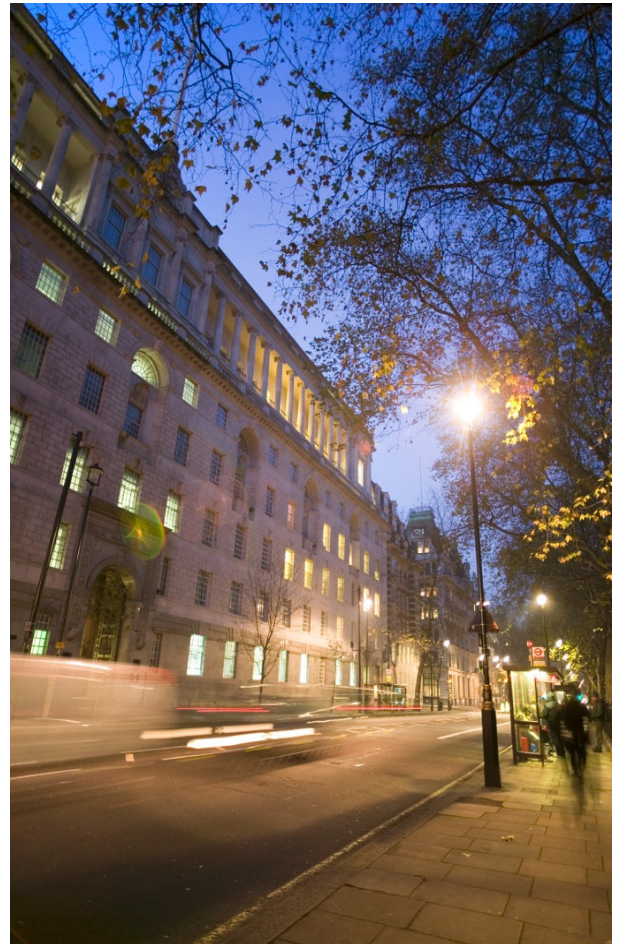


## Noble House, Smith Square, London, United Kingdom

### Challenges

- Nobel House is the headquarter building for DEFRA in Smith Square, London. It was first occupied by DEFRA in the 1980s and the cellular office space was typical of that time. In a modern day office environment, this layout was no longer meeting our clients' requirements, and they commissioned a £25 million refurbishment project.
- The building needed to offer a new and much wider range of facilities for the department's head office staff. The building's occupancy was increased from 580 to 750 and there was also the challenge of sustainability, as this was a major requirement for the project. The refurbishment proceeded in phases beginning on the seventh floor and working down through the building. The building remained occupied throughout the refurbishment which created a huge challenge for the design team. It was essential that the team coordinated and planned the works in such a way as to minimize the disruption to users i.e. noisy work carried out overnight.
- Some of the new facilities included:
  - A modern, comfortable and open plan working environment with increased occupancy.
  - An enclosed atrium offering informal meeting areas.
  - New and improved conference facilities.
  - A modern and expanded catering facility.
  - An expanded and more welcoming reception area.
- Sustainability was a major requirement for the project. This meant recycling anything that came out of the building, making as much use as possible of the local workforce and supplies, sourcing sustainable construction materials and maximizing the use of natural ventilation within the building.
- One of the key aims of the project team was to ensure that the refurbishment was executed to the highest sustainability standards. The finished building provides a working environment that is sustainable for the planet and the building's occupants.
- A combined heat and power system which generates electricity and utilizes the waste heat was also installed.



### Solutions

- Davis Langdon was appointed as quantity surveyor providing full pre and post management services.
- Sustainable design was a key focus of the project — key elements included:
  - Materials Matrix — one of the first things the project team did was to draw up a "materials matrix", a set of criteria that would be used to assess all of the materials considered for use in the building. The matrix took into account not just the energy used in the production process, but also the distance the materials had travelled from the manufacturer, their ease of disposal, their recyclable and recycled content, as well as their cost. Each material was rated according to these factors and in

most cases one material stood out a long way from the others, so was chosen. In some cases changes in design were called for in order to use the most sustainable materials. For example, sheep's wool was used behind panels in the walls as insulation rather than synthetic insulation.

- Energy — due to the building having a surprisingly small roof area, it was impossible to fit enough solar panels to power the building. Therefore, combined heat and power (CHP) plants were looked at. By using 'waste' heat, CHP plants can improve energy efficiency and reduce the building's carbon footprint.
- Boilers — the waste heat from the CHP plant is also used to preheat water to the boilers for heating. A system of high efficiency (95%), ultra-low boilers that are low polluting were chosen.
- Keeping cool — in summer the building will be kept cool by a natural ventilation system, based on the science behind the distinctive wind-towers that have been used for centuries to keep buildings cool in cities such as Dubai. Nobel House is a square ring-shaped building with windows opening both to the outside and to the internal "hole" or light well in the middle. A lightweight roof has been constructed over the light well with small windows around the edge. These windows are opened and closed by a computer system that gauges the outside weather. Elsewhere in the building, fridges and freezers that are zero ozone depleting and are much more energy efficient were used to reduce further the carbon impact of the building.
- Water — there's no excuse for leaving the taps running in Nobel House as they have installed sensor flow taps which use light sensors to sense when your hands are under the tap, turning the taps on and off automatically after a fixed time.
- Waste — it was important that the refurbishment process itself was as sustainable and produced as little waste as possible. Throughout, the project manager's monitored power and water consumption during the fit-outs and were able to identify any unusually high levels of usage. The movement of vehicles was also monitored to help contractors be more energy and transport efficient on future projects.



## Results

- Once we started the project, the plans needed to be modified and design changes were made throughout the duration of the contract. Davis Langdon used their expertise to value all the design changes and agree the costs with the contractors, providing full cost management services under a traditional contract.
- On completion of the project the building received one of the highest BREAAAM ratings for a refurbished property and a number of sustainability awards followed.
- Following the refurbishment of the seventh floor, 216 tonnes of waste was removed from the site and over 130 tonnes was recycled. The materials recycled include wood, metal, hardcore and glass.

- As well as having an excellent BREEAM rating as a target we also targeted:
  - Sustainable use of refrigerants.
  - Energy performance and water use.
  - Sourcing sustainable construction materials.
  - Re-use or recycling of materials arising from demolition.
- The project was completed in early 2006. The staff now benefit from a larger restaurant and sixth floor roof garden that has proved very popular and has been well received.
- The project was awarded the 2005 Sustainability Award by the Royal Institution of Chartered Surveyors.
- Some of the notable outcomes of this project were:
  - Energy performance is 40% better than “typical” (based on ECON 19).
  - A gas-fired combined heat and power plant provides 25% of the required electrical load, plus hot water and additional cooling through ammonia chillers.
  - Light sensitive automatic controls govern an intelligent electrical lighting system, minimising demand for excess interior lighting.
  - All timber used was Forest Stewardship Council certified as sustainably sourced. Paints and finishes with low volatile organic compound ratings were specified to minimise harm to human health.
  - Water efficiency is 40% better than typical.
  - Biodiversity is enhanced through a roof garden.



### Reflections

- Due to this project being so focused on sustainability, the lessons learnt have been championed by DEFRA and Davis Langdon, and will be used on future refurbishment and new build projects:
  - Appoint a sustainability champion from the outset.
  - Set high, but achievable recycling targets.
  - Encourage the use of alternative sustainable material.
  - Undertake regular sustainability audits of contractors.
  - Focus on renewable energy sources.
  - Encourage whole life cycle costing approach.