



**PROJECT
CLIENT**

CONSTRUCTION OF HAROLD HILL FIRE STATION
LONDON FIRE AND EMERGENCY PLANNING
AUTHORITY

VALUE

£2.1M

CONSULTANT

SCOTT WILSON GROUP



FIRST FIRE STATION IN LONDON FOR DECADES

In January 2010 Lakehouse completed construction of a new fire station in Harold Hill, Essex, for the London Fire and Emergency Planning Authority (LFEPA), which runs the London Fire Brigade. The £2.1million project started in May 2009, and has seen three existing light industrial units at the Falcon Business Centre transformed into a 21st century fire station - the first fire station to be built in London for twelve years and a mere stone's throw from Lakehouse's headquarters in Romford.

The building is designed to minimize its carbon footprint, making efficient use of energy and water. It can also be adapted to house more fire engines if necessary or altered for other uses. Low carbon technologies at the new station include photovoltaic panels, solar heating panels, rainwater

harvesting system, combined heat and power unit, and heat recovery unit.

AWARD WINNING

Just three months after the project completed, Lakehouse received a National Site Award from the Considerate Constructor Scheme. Judges commended the project for its exceptional achievements in the category of 'neighbour', and said that the site was a credit to Lakehouse and to the site team.

Harold Hill Fire Station was awarded Havering Council's Sustainable Design and Construction Award, in September 2009. The awards reward excellence and innovation, and recognise best practice within the Havering business community.



SOLAR PHOTOVOLTAIC PANELS

These semi-conductor panels convert light directly into electricity. 114 x 180w photovoltaic modules have been installed on the roof of the station, giving a combined output of 15,416 kW hours per annum.

An annual CO₂ saving of 8,756kg is expected. The units are extremely reliable, even in overcast conditions, and require only minimum maintenance.

SOLAR HEATING PANELS

16 solar heating panels, sited on the roof of the station, will use radiation from the sun to heat water. This in turn will pre-heat water used for providing hot water to the station.

Unused heat will pass into a storage bank to be used for the central heating system. Each of the solar panels contains a horizontally mounted vacuum tube which is 93% efficient and a curved collecting surface.

The system will produce 13,500 kilowatt hours of heat per annum and provide a reduction of around 2,619kg of CO₂ per annum.

RAINWATER HARVESTING SYSTEM

One of the main concerns surrounding the effects of climate change is the increase in long drought periods followed by sudden rainfall, leading to water shortages and flooding.

The installation of a rainwater harvesting system will enable the station to reduce its mains water consumption, by topping it up with rainwater which will be re-used predominantly in WCs and for washing fire vehicles. The new system could replace up to 100% toilet flushing and vehicle washing demand, reducing usage of mains water and enabling the station to benefit from lower utility bills.

COMBINED HEAT AND POWER UNIT

Trials carried out by the Carbon Trust for the commercial micro combined heat and power (CHP) boiler have proved that significant carbon savings can be made when installed as the lead heat source.

The micro CHP boiler that we have installed will produce 12.5kW of heat and 5.5kW of low cost electricity for the station. An exhaust gas condenser will increase the heat output from the boiler to 15.5kW. An annual CO₂ saving of 9,175kg is anticipated as a result. The latest technology in electrical interfaces will allow the electricity from the CHP unit to be fed directly into the station's electrical circuits.

HEAT RECOVERY UNIT

To improve building efficiency the station has been made more airtight. While opening a window does provide ventilation, the station's heat and humidity will then be lost in the winter and gained in the summer, both of which are undesirable for the indoor climate and for energy efficiency. Heat recovery ventilation (HRV) technology will help to keep the station well ventilated with fresh air and delivers better climate control and energy efficiency.

HEAT BANK

The heat bank or 'accumulator' that we have installed is a latent energy storage system that acts as a storage unit for unused heat. The system captures all heat not used from the combined heat and power unit and the solar system. The heat is then stored until it is required and subsequently reused to heat the building itself. The heat bank has 15 paraffin filled storage cells. By using the stored heat energy bills can be reduced by up to 60%.