

## THE VILLAGE BUTTERFIELD LUTON

# ENVIRONMENTAL CONTROL

The offices at The Village have been built around an innovative environmental strategy that is designed to make the buildings operate with a carbon footprint for environmental control that is 80% less than for equivalent air conditioned office buildings.

The passive design strategy uses:

- a high performance building envelope to minimise and control heat flows,
- exposed concrete ceiling soffits to absorb energy and provide a thermal flywheel effect to control temperature fluctuations,
- air distributed within the floor to floor diffusers to exploit buoyancy effects and maximise free cooling use
- external 80m long buried earth ducts through which the fresh air for the buildings occupants is drawn. These effectively pre-cool incoming fresh air in summer to eliminate the need for mechanical cooling to provide comfort.
- The earth ducts also pre-heat incoming fresh air in winter to dramatically reduce heating bills.

The concrete earth ducts are buried 1m below the ground, which is at an almost constant temperature throughout the year. In the summer, the mass of the earth that comes into contact with the ducts will cool the air before it is introduced into the buildings. The system is controlled to operate overnight in the summer; air is first introduced into the buildings so that any heat accumulated during the day is flushed out and the ceiling slabs are charged with “coolth”, once the building has reached the target temperature (20°C), the building is by-passed but the ducts continue to flush with cool outdoor air to take maximum advantage of the storage potential in the earth.

In winter the cold air is warmed up by the ground, which will be 12-16°C warmer than outdoors on a very cold day, before passing over a small heating panel to bring it to room temperature.

In addition the lighting has been designed using the latest in low energy lamp and reflector technology and perimeter zones are controlled on daylight sensors linked to dimmer controls to match lighting needs to ambient levels and reduce energy use.

The Village buildings are predicted to have a carbon footprint of 20% of standard air conditioned out of town buildings. They will be closely monitored in partnership with the University of Southampton as the buildings are thought to be the first of their kind in the UK. The Butterfield office village is likely to become a benchmark scheme for the future as efforts to produce “zero-carbon” buildings intensify.