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## Institute of Arable Crops Research, Harpenden, Hertfordshire

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The Institute of Arable Crops Research carry out world leading research into plant-based agriculture, with the objective of achieving improvements in rural and agricultural economies across the world that are financially, economically and socially sustainable.

Commissioned in early 2000, this new laboratory provides 6400m<sup>2</sup> of state of the art laboratory and office accommodation for over 200 staff, and represents the Institute's largest building project to date. The brief demanded a high quality environment which was also adaptable to meet the changing needs of future research programmes. One of the key requirements was to explore new ways of working, to break down ownership and encourage social interaction - the antithesis of their existing working patterns within traditional cellular offices and laboratories.

The new laboratory occupies a central position within the Institute's Harpenden site, surrounded by their existing buildings dating from the 1950's. As the new, much needed heart to the site, it replaces numerous derelict and outdated buildings that had developed in a piecemeal way over many years. The new accommodation is arranged primarily over two floors. Eight open-plan laboratories, each with access to a range of shared specialist equipment rooms, inhabit the northern side of the building. Office space inhabits the southern side of the building. A central spine corridor leads from the reception providing access to all areas.

The building has an exposed in-situ concrete frame - minimising the transfer of vibration, crucial for very sensitive scientific equipment - providing thermal capacity - enabling a clear understanding of the structural solution. Externally, the concrete is complimented by a predominantly monochromatic palette of greys, silver and white. Internally, the same monochromatic palette continues, but complimented by the warm hues of maple used for furniture, handrails and doors. The limited use of strong, bold colours highlight key areas.

The briefing process identified the need for a number of cellular offices for senior staff. These are grouped around a series of five lightwells which allow high levels of natural light to penetrate deep into the building. This necklace of offices and lightwells running along the southern side of the main circulation routes creates a semi-permeable screen for the open plan office areas, and positions key staff at the 'gateways' to the laboratories.

Inevitably the laboratories are air conditioned, its position on the northern side of the

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building minimises solar gains which would make the mechanical services work harder and therefore use more energy. The office areas are situated on the southern side of the building and are naturally ventilated spaces, with an abundance of natural light. Ventilation of these spaces is provided using the Termodeck system - fresh supply air passes through the hollow cores of precast concrete floor planks. The passively conditioned air is then ducted from the concrete planks to an underfloor void, and is introduced to the office areas at low velocity through floor diffusers. The warmer stale air is extracted from within the lightwells close to roof level. The high thermal mass of the concrete planks and frame act as a thermal flywheel. In the summer months the concrete is pre-cooled overnight, enabling it to absorb heat generated during the working day.

Extensive glazing to the south façade allows an abundance of daylight to flood into the open plan office areas, and offers panoramic views over the green space which is a focus to the centre of the site. External shading minimises solar gains which would otherwise severely compromise the ventilation system. It cuts out high angle sun in the summer, but allows winter sun to penetrate the internal spaces when solar gains are a benefit. Concrete fin shaped columns help to reduce the effects of low angle sun at the beginning and end of the day.

#### Project

Construction cost £14.65m

Size (incl plant areas) 6,400m<sup>2</sup>

Contract GC Works

Completed May 2003

Cost/m<sup>2</sup> £2250

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