The Centre for Mathematical Sciences has broken down barriers between disciplines in a working environment highly praised by academics and students.

The Centre for Mathematical Sciences was designed to encourage academic dialogue and discovery by bringing together the Pure and Applied Mathematics Departments of the University of Cambridge.

The complex was built in three phases and is made up of seven pavilions; a central social building; the circular Betty and Gordon Moore Library, home to the Stephen Hawking archive; and a gatehouse that forms a dramatic entrance to a new contemporary Cambridge courtyard.

The Centre for Mathematical Sciences has encouraged new research and funding and has had a positive impact on staff and student recruitment.

In a 2002 Post-occupancy Review of Buildings and their Engineering (PROBE) study, the performance of the buildings, together with a high level of satisfaction among academics and students, placed the Centre for Mathematical Sciences in the top percentile, a result endorsed by BSRIA after a subsequent study in 2006.
Context
The Centre for Mathematical Sciences was built on a greenfield site in suburban west Cambridge and its scale responds sympathetically to its residential neighbours.

By creating seven separate pavilions street edges are visually maintained and views across the site preserved. The largest building – the central social hub – avoids dominating its surroundings by being partially sunk into the ground under a grass roof. This gives the grounds the appearance of being stepped or layered.

The landscape design, including planting around the perimeter of the site, has knitted the buildings well into their leafy suburban setting.

Creativity
The masterplan for the Centre for Mathematical Sciences and, in particular, the design of social circulation areas, encourages the crossing of boundaries between the disciplines of pure and applied mathematics.

As well as formal lecture theatres and private study spaces, the layout of the buildings and the way that they work provide academics and students with places to meet casually and exchange ideas.

Private spaces progress naturally into public spaces. The seven pavilions – one of them double sized and housing the main lecture theatre – are gathered around the tapering grass-roofed central building, which is the social heart of the academic community. Each pavilion has 40 study spaces and a shared ground floor common room. In four of the pavilions this opens directly into the central social hub. It is here that people come together to relax and interact with each other in the dining hall and informal meeting places.

All the buildings are generously planned, thoughtfully finished and detailed throughout, and people have a high degree of personal control over their working environment.

Each zinc-roofed pavilion has a lift shaft at its centre, surrounded by a central stair encased in a concrete and glass block tower and topped with a glazed lantern. Circular corridors give access to the study spaces around the perimeter.

Slender, pre-cast concrete arches on massive buttresses span the barrel-vaulted central building. It has a slatted timber ceiling and daylight is brought down into the middle of the space through strips of glass block set in the apex of the roof’s curve. Above, the glass blocks form the pavement of an axial path that runs along the roof.
Climate
The post-occupancy PROBE study commissioned by the University of Cambridge confirmed good energy performance.

The buildings are designed to stay warm in winter and cool in summer – with low running costs. They have exposed thermal mass, natural ventilation, night cooling, solar shading and a building management system to regulate the internal environment. The Centre for Mathematical Sciences provides a good example of advanced natural ventilation, with automatic controls and manual override for opening windows and vents, and internal blinds.

In areas with no windows, ventilation and lighting are introduced through the glass lanterns that are a feature of the pavilion rooftops. Solar sensors and movement detectors control lighting. The central social building is insulated by its grass roof.

The buildings are ageing well – thanks to high-quality materials and efficient building services maintenance.

Above: Diagrams showing the pavilions arranged for private study, for sharing ideas with your immediate neighbours and then in your shared sitting room, four of which open direct into the central core.

Above: The thermal chimneys ventilate the central areas, let light into the pavilion stairs and house the extract flues while the projecting eaves protect the window from the sun. Photo©Peter Mackinven.
Above: Ground floor plan showing six single and one double pavilion, each with its own disciplines, clustered around a tapering central core with a gatehouse that sits on the central axis and the circular library.

Above: Lower ground floor showing the main lecture theatre underneath the central social core.