Here comes the sun

A carefully designed system of mirrors – the work of LAPD – brings daylight into the atrium at the Westfield London shopping centre

One of the issues that has been addressed in both new and refurbished shopping centres is the ingress of daylight. The 21st century mall is no longer hermetically sealed from the exterior but – through a variety of techniques – exposed at least in places to the dynamism of daylight.

At the Marks and Spencer store in the Westfield London, west London's new shopping colossus, LAPD has used a heliostat system to bring natural lighting to the atrium. "We wanted to go some way to creating a healthy, vibrant environment in which people would be happy to spend time," says LAPD's Simon Thorp. "M&S was extremely receptive to the concept and the atrium itself was well exposed to sunlight throughout the year."

Mirror, mirror

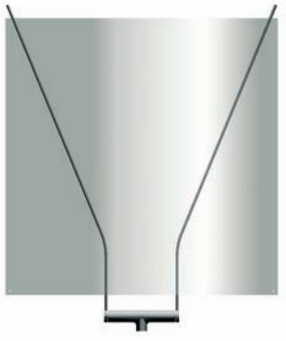
The system comprises two mirrors. The main mirror is the heliostat that tracks the sun throughout the year and directs sunlight onto the secondary mirror. This in turn is made up of nine smaller mirrors that can be angled to direct sunlight into different parts of the atrium.

Five of the mirrors have a mosaic effect created by laminating smaller mirrors – 36 in all, measuring 1,750 by 850mm – at different angles to the base mirror. This creates a dappled sunlight effect in the food hall 17 metres below. The remaining four mirrors are flat. They are directed onto prismatic reflector 'angels' mounted at the sides of the escalator that reflect and refract light, creating rainbows and reflected white light in the atrium.

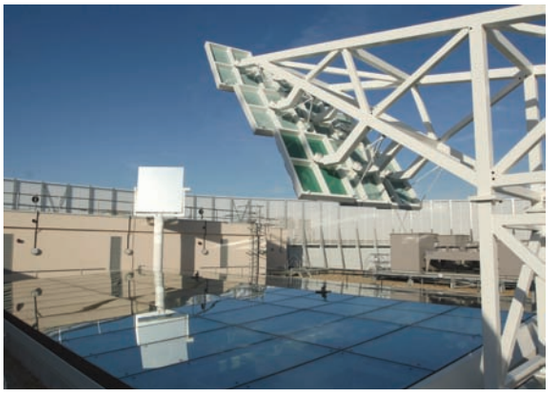
"Initially the nine mirrors on the secondary mirror structure were designed to be flat mirrors directing beams of sunlight to focal points within the atrium," says Thorp. "As the design evolved so did the idea of creating dappled light within the atrium."

Full-scale prototypes and CAD models were used to enable precise positioning of the secondary mirror structure, ensuring the light could be threaded between the escalators in the atrium space.

"As long as the primary mirror can receive sunlight throughout the year the system can be applied to many applications," says Thorp. "In general, more impact is created when the sunlight is projected through smaller scale atriums where the contrast is increased. It can be intriguing to introduce it into places that you wouldn't expect to receive direct sunlight." ■



Angel unwrapped The elegant design of the prismatic refractor is clear in LAPD's schematic



First floor, bananas, flowers, refractors Prismatic 'angels' on the sides of the escalator create rainbows and reflected white light in the atrium

Outside story On the roof, the heliostat tracks the sun and directs sunlight onto a secondary mirror