

in Kew Royal Botanic Gardens' Millennium Seed Bank Project. During the day these spikes work like optical fibres bringing light into the interior, while at night tiny LEDs shine along them, making the whole structure glow.

Coming up with the concept though was the easy bit. Some way had to be found of getting it built. The project was delivered as a design and build and the task of project managing it all fell to Mace. This, though, is far from your typical project management job (indeed last week Mace won an award at the CIOB Global Construction Summit in Shanghai for "outstanding achievement in construction management"). "Because of the complexity of the project and the different ways of working in China we've had to take a very hands-on approach," says Mark Tranter, associate director. "We were working around the clock and through the holidays to deliver it."

Because it was being constructed in China, Mace had to first bring on board a local technical institute to translate the UK design so that it complied with local regulations and the requirements set down by the Expo organisers. It then had to appoint a main contractor to deliver it.

No-one had constructed a building pierced with tens of thousands of acrylic spikes before and as well as finding a way of constructing it, with a relatively unskilled workforce, there was also the small matter of finding manufacturers to deliver the 1.2 million components needed to make the spikes, many of which had to be hand made.

Unlike most design-and-build projects, Heatherwick Studio worked closely with Mace and the Suzhong Construction Group throughout the construction phase, providing detail design input – of which there was plenty. The spikes themselves are made out of 7.5m-long acrylic extrusions. On the end that protrudes into the pavilion is a 400mm-long section that was made separately and contains the seeds. These were cast in a mould and then sanded and polished by hand before being adhered to the extrusion. All this work had to be done in China because of the volumes required.

Although the spikes are designed to sway in a breeze, the pavilion needs to be able to withstand a typhoon. So a 25mm-diameter, 5.7m-long aluminium tube was first slid over each acrylic rod. Another 3.2m-long section on top of that allows the spikes to move but gives them enough strength to avoid snapping. Before manufacturing could begin, the spikes underwent rigorous testing and bespoke components had to be

seen as a country of tradition and stability, which is no bad thing, says John McManus of the Foreign Office. But as the Chinese economy motors on through the downturn, this isn't enough. "We're not seen as exciting or good at design or forward thinking."

Keen to drive home the message that there's more to Britain than beefeaters and red telephone boxes, the British government has pulled out all the stops. The focal point of its £26m investment is the Heatherwick Studio-designed pavilion.

Katerina Dionysopoulou, architect on the scheme, says visitors to expos tend to either remember the building or the exhibition inside. "We wanted to combine the two."

What it came up with was a 20m-high cube-like structure pierced by 60,686 acrylic spikes. Each spike is embedded with a selection of hand-picked seeds sourced from the Kunning Institute of Botany, a partner

How many times have you seen photographs of the British pavilion for this year's Shanghai Expo and had to look again to make sure they are not computer generated? In the flesh, amid the 200 or more pavilions all jostling for attention on the vast Expo site, it's no less dramatic. When the thousands of acrylic fronds get caught in the breeze, it becomes almost hypnotising.

And, as one of the most talked about and visited of all pavilions at the event – and having just last week scooped the Lubetkin prize – it seems to be living up to its task, which is to alter the way the Chinese perceive Britain. Research shows that we're

IN AT THE SHARP END

The 60,686 acrylic spikes on Heatherwick Studio's British pavilion have been the talk of the Shanghai Expo, as **Stephen Kennett** found out when he paid a visit. But how on earth was it all put together?