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Martin Ostermann
and Lena Kleinheinz.
Photo J.L. Diehl

PLASTIC MAKES PERFECT

To Berlin-based Magma, mobile architecture offers an alternative way of thinking about consumption and environment.

Text Terri Peters

Berlin architecture office Magma is best known for its Olympic Shooting Venue in London, but the small office of six has been designing mobile, membrane architecture at various scales for nearly a decade. They do fabric-clad demountable interiors, stretchable mobile pavilions and moving textile roofs. Reversible architecture – designs that can be popped up, folded back down and reanimated in different settings – is becoming Magma's signature.

Lena Kleinheinz and Martin Ostermann founded Magma in 2003 in Berlin, building on Ostermann's design and project-management experience at Studio Daniel Libeskind and Kleinheinz's skills as an exhibition designer. Apart from the London Olympic Shooting Venue, the office has completed another major project this summer: the Al Qasba Theatre in Sharjah, the third largest emirate of the UAE. Both designs can be flat-packed for easy shipment and reused.

'We started working on a design for the Al Qasba Theatre in 2008, before the crisis, after being suggested to the clients by their acoustic engineer,' says Kleinheinz. The brief for the theatre – part of an arts centre next to a giant Ferris wheel, both of which overlook the Qasba Canal – asked for the conversion of a conventional meeting hall into a 'spectacular' multipurpose interior. The dramatic result is a geometric space whose walls and ceiling are wrapped in fabric. Inspired by the local landscape, specifically Sharjah's sand dunes, these undulating surfaces are broken by asymmetric openings that permit light to seep through, creating an immersive environment inside the auditorium. The stretch fabric conceals not only the contours of the rectangular room but also the underlying acoustic insulation. Because the structure was fabricated in Germany, shipped to Sharjah and installed on site, all aspects had to be ▷

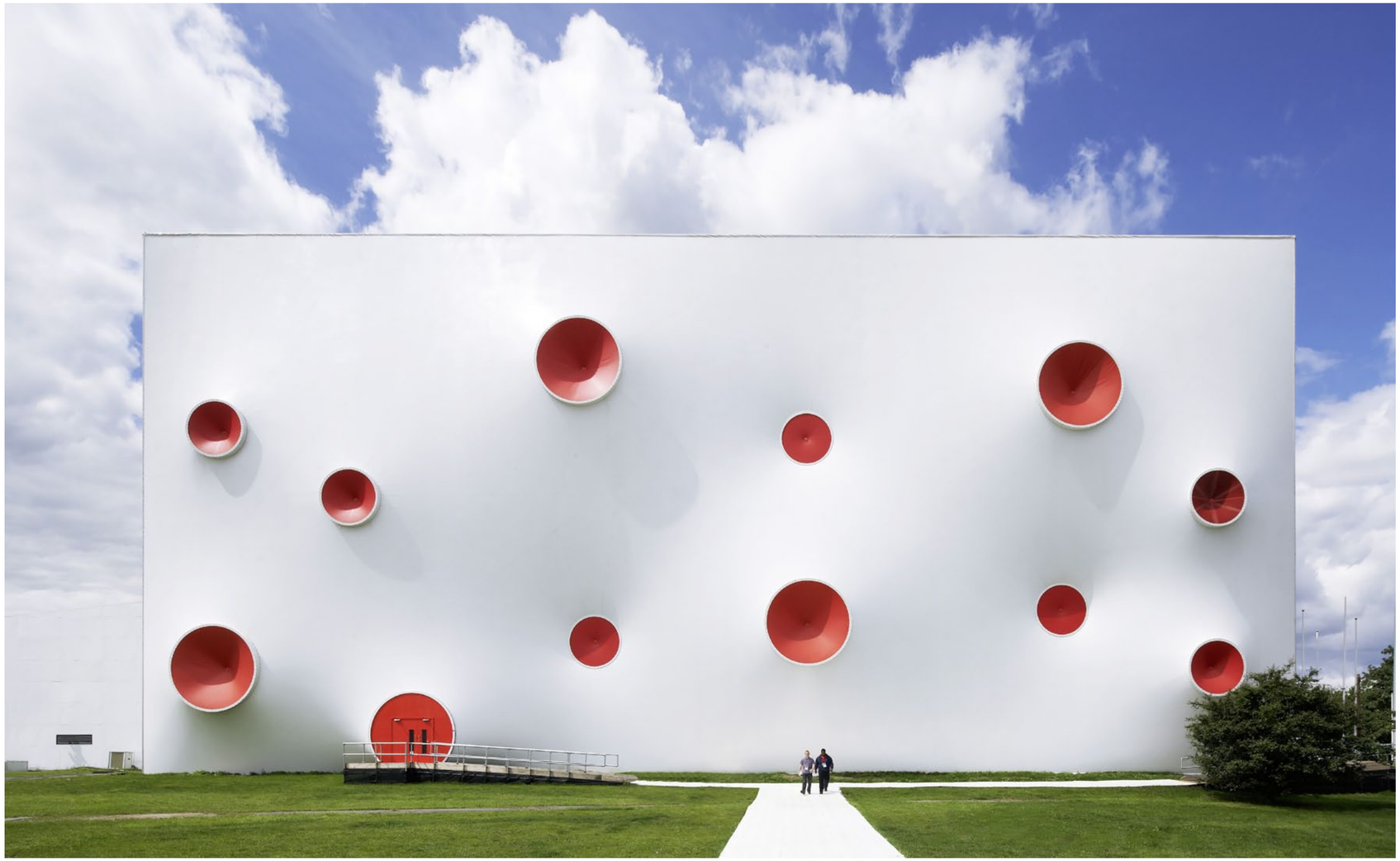
Shooting ranges partly in the open air feature 'climatized comfort zone' seating under the roof.

Shooting Venues: Olympic Games

London / UK
2012

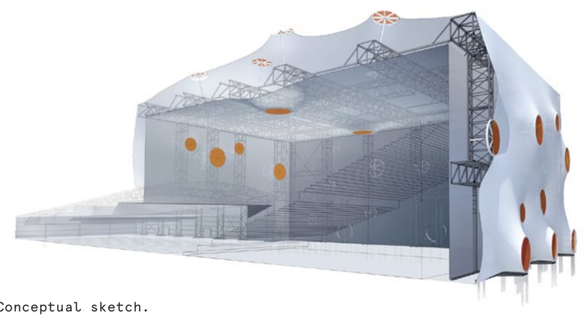
For the Olympic and Paralympic Games that took place in London this summer, Magma designed three mobile buildings to accommodate the 10-m, 25-m and 50-m shooting competitions. The design of the complex and its dynamically curving spaces was driven by a desire to evoke the experience of flow and precision inherent in the shooting sport. All three ranges were enclosed within crisp white, double-curved membrane façades studded with vibrantly coloured openings – large 'dots' that both animated the façades and functioned as tension nodes. Used for this project was 18,000 m² of phthalate-free PVC membrane, which performs best when stretched taut to prevent both walls and roof from flapping in the wind.

Photos Hufton+Crow



Large coloured circles on the buildings act as ventilation intake and frame ground-level entrances.

'EVEN A LIGHT BREEZE CAN MAKE THE ROOF OF A MEMBRANE BUILDING ACT LIKE A PARACHUTE'



Conceptual sketch.

The ceiling is covered by a stretch fabric that conceals mechanical systems and acoustic insulation.

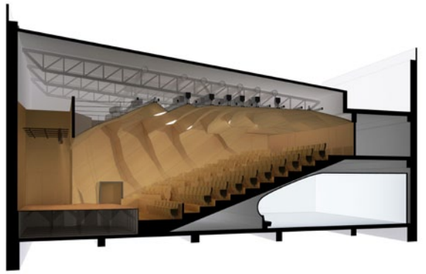
Al Qasba Theatre

Sharjah / UAE
2012

Al Qasba is the main cultural centre of the emirate of Sharjah. Two 150-m-long, four-storey buildings face each other from opposite banks of the Qasba Canal. Magma redesigned the interior of Masrah Al Qasba. The theatre's multipurpose auditorium hosts many events, including Sharjah's annual film festival. Magma wrapped walls and ceiling in an undulating surface resembling sand dunes. Light spilling from crevices in the material enhances the gentle ridges and hollows of the 'dunes'. A fabric with an earthen shade similar to that of walls and ceiling was used to cover existing seating. The result is continuously flowing space that is both calm and inspiring.

Photos Thorsten Seidel

Al Qasba is a cultural centre that includes art galleries, theatres, shops, restaurants and offices.



Perspective section.

'WE'VE LEARNED TO SEE WHAT MATERIALS OR SKILLS WE CAN PLUG INTO ON SITE'

◁ considered for ease of assembly and transportability. 'It was quite a challenge working there,' says Kleinheinz diplomatically. 'I think the next project will be much easier to do.' Communication sometimes posed a problem, admits Ostermann, but the project was a fascinating experience that they have learned from. 'For example, once we were all looking at a prototype that would be recessed into a plaster wall with a diffuser for the light. It looked okay. I touched it to see if it was proud or recessed, and the metal ring just fell off. I picked it off the floor and realized it was just black-painted, hand-sawed timber.' Ostermann says that local contractors did not really understand their design intentions or their reasons for building mock-ups. 'Next time, we should consider things differently. In this case, we could have worked with timber – and really tapped into their expertise and local knowledge.'

The theatre design builds on an earlier project, *Head In*, an installation that appeared in 2007 at the Berlinische Galerie, a museum of modern art in Berlin. Recalling the invitation to show their work, Kleinheinz says the museum was 'probably expecting we would put some models on plinths or drawings on walls'. Instead, the designers seized the chance to implement soft-space ideas from a series of unbuilt fabric-structure projects, eager to test double-curved spatial geometries at full scale and experience the results. Their design process involved the making and testing of large prototypes at scales of 1:5 and 1:3.

Stretched and suspended over the floor, walls and ceiling of the 150-m² exhibition space, Magma's installation featured an orange fabric made from synthetic fibre, pierced by openings on the underside. In photos it resembles *Marsyas*, the huge red-PVC membrane that Anish Kapoor designed for Tate Modern's Turbine Hall, but Magma's more intimate *Head In* invited visitors to enter the installation, pop up into the sculpture and look at the architectural models suspended inside. 'Usually, people in galleries can see edges and walls, and our installation changed how people behaved in the space,' says Ostermann. ▷

BMW Guggenheim Lab

Design by Atelier Bow-Wow
Local Partner: Magma
2011

Atelier Bow-Wow designed the BMW Guggenheim Lab, a travelling public forum first erected in Manhattan's East Village, New York City, where it remained from 3 August to 16 October 2011. The following summer (15 June to 29 July 2012), it appeared at the Pfefferberg complex in Berlin. The initial tour of three cities concludes in late 2012 and early 2013, when the BMW Guggenheim Lab opens its doors in Mumbai. Two tours scheduled for the future – each comprising three cities – will involve new teams of architects.

Photos Christian Richters

'THE KEY TO THE SUCCESS OF GLOBAL PROJECTS LIES IN ESTABLISHING LINKS AND NETWORKS'

A statement issued by the Guggenheim Museum includes the following: 'The BMW Guggenheim Lab will raise awareness of important issues, generate specific ideas for particular cities, and explore ideas and solutions related to sustainable design, yielding lasting benefits for cities around the world.'

◁ 'They talked to each other and seemed to feel as if each hole was a new room.' Kleinheinz elaborates: 'Inside, it felt like you were dipping your head into a bucket of colour.'

In 2011 in Berlin, Magma coordinated the arrival and assembly of BMW Guggenheim Lab, a temporary event space designed by Atelier Bow-Wow and open to visitors for several months. Currently making a two-year global tour, the lightweight venue consists of a suspended rectangular 'tool box' wrapped in transparent mesh. 'It is mainly but not entirely carbon fibre, so we still needed cranes to hoist it into place,' says Ostermann. 'There are steel nodal points and a lot of heavier equipment and wood fittings. But if it had been all carbon fibre, it probably could have been lifted into place by one or two people.' After arriving in Berlin flat-packed, all components were immediately X-rayed to check for cracks that might affect structural performance. Although lightweight and strong, carbon fibre is not the ideal travelling material. Open at both ends to engage with the surrounding community, the pavilion functions as studio, outdoor lecture space and stage.

BMW Guggenheim Lab's latest stop is Mumbai, India. 'Although it's not our design, I think this project says something about our work,' says Kleinheinz. 'Much of our work here was about cross-cultural architectural translating. We interpreted design and construction processes, local building regulations and permits, ways of expressing the famous German quality and of adapting projects to local requirements without sacrificing the design.' Having projects simultaneously under construction in London and Sharjah doesn't faze this duo, perhaps because Ohio-born, UK-educated Ostermann and Danish-born Kleinheinz have an innate international approach, as well as experience in collaborating with people with varying perspectives. Architecture that migrates along with need is something they understand. Kleinheinz believes the key to the success of global projects – so many of which are available to architects today – lies in 'establishing links and networks'. ▷

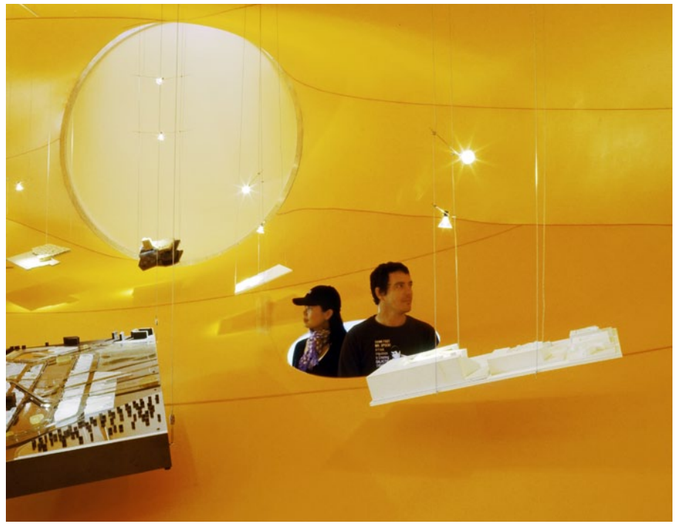
In Berlin, the BMW Guggenheim Lab occupied the Pfefferberg complex, located in the city's Prenzlauer Berg district. The site was once home to a brewery.

Head In

Berlin / Germany
2007

The 11th edition of *Jetzt I Now*, a series of exhibitions at the Berlinische Galerie, a museum of modern art in Berlin, included a dramatic installation that Magma designed especially for the allotted 150-m² exhibition space. The work was based on experiments with materials, forms, colours and light. The focus of the project was an amorphous sculpture made from an orange synthetic fabric. Its smooth yet complex shape was developed on neither drawing board nor computer; it was the result of an empirical approach that included experiments to test the properties of an extremely flexible fabric (a blend of polyamide and elastane) under force.

Photos J.L. Diehl



On the inside, models and other objects were on display.

Magma stretched orange fabric between the walls and ceiling of the exhibition space, producing an installation of a high design calibre.

'INSIDE THE INSTALLATION, IT FELT LIKE YOU WERE DIPPING YOUR HEAD INTO A BUCKET OF COLOUR'

◁ The firm's three Olympian buildings – a series of PVC-clad, double-curved, white boxes – served as venues for the 25-m and combined ranges and the finals range for Olympic and Paralympic Shooting. The longest structure has a fabric façade extending over 100 m. The newly developed phthalate-free PVC is recyclable, and no composite materials or adhesives were used. Even so, PVC seems an odd choice for a shooting venue, as sound transmits right through it, and it certainly isn't known as a bulletproof material. 'We were there when they put the roof on the finals range,' says Ostermann, addressing an entirely different concern. 'One thing we hadn't thought about is that a light breeze can make the roof act like a parachute. It was amazing to see. They had to wait for two or three weeks to install each façade, until the wind and weather conditions were just right.'

Sculptural coloured dots on exterior walls look like button-tufted upholstery, or like suckers on octopus tentacles, but they are not purely aesthetic. Apart from breaking up huge expanses of white PVC, the building's brightly hued tension nodes draw natural ventilation and daylight inside and frame entrances at ground level. 'The round elements relate to the distribution of forces,' explains Ostermann. 'If you have a rectangular frame with edges, the distribution is less efficient.' He says it's 'actually very conventional', comparing it to 'putting circular openings in a fabric roof, but here we put them on the façade'. After the Olympics, the buildings will be dismantled and stored. If all goes as planned, the two smaller buildings will be used for the 2014 Commonwealth Games in Glasgow.

Magma anticipates more mobile architecture in the future; it seems to be the direction of the practice and perhaps an alternative way of thinking about consumption and environment. 'The biggest challenge of mobile architecture is in knowing what to pack up and move and what to acquire locally,' says Kleinheinz. 'One thing we've learned is to see what materials or skills we can plug into on site – and to be willing to adapt.' ◁

magmaarchitecture.com

A window that normally functions as an entrance to the adjacent room offered a view into the orange sculpture.