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HEYDAR ALIYEV CENTER
Felix Mara

Baku's Heydar Aliyev Center is a national symbol for Azerbaijan, a catalyst for regeneration, and, in the broadest sense, a regional showpiece. Constructing Zaha Hadid Architects' audacious design for the Center has drawn on expertise from Turkey, the United Arab Emirates, and the Commonwealth of Independent States, as well as further afield. This explains the feel-good factor and can-do mentality which have made it possible. It is a labor of love.

The narrative which follows touches on some of the principles and innovations examined elsewhere in this book: the uncompromising architectural vision, unbridled geometric inventiveness, attention to detail, and resourceful engineering which, according to project architect Saffet Kaya Bekiroglu, involved constructing mock-ups of practically everything to evaluate appearance as well as performance; the contractors' and engineers' quest for faster, lighter, more buildable answers to problems posed by irregular, nonrectilinear geometry and large column-free spaces — and the project team's acquiescence to an approach which was emphatically led not by engineering, but by architecture.

Baku is only one of many settings for this narrative, which begins on a site in the capital with challenging ground conditions and traversed by a sheer drop. The focus soon shifts to London, where, having been commissioned, Zaha Hadid Architects develop the scheme design, working with consulting engineer AKT, now AKTII, and lighting consultant MBLD, both located nearby. The architects explore the panelization geometry of the internal and external skin and develop the predominantly hard landscape, which benefits from the ironing out of the sheer drop, resolved by locating some of the car parking below ground, but outside the building's footprint, to avoid security breaches. The architects' long-term collaborator AKT develops the roof structure design, with trusses spanning between supports within the perimeter envelope and concrete sheer walls.

In Stuttgart, engineering consultancy Werner Sobek, initially appointed by design-build contractor DiA as facade consultant, assists with the technical design of critical areas such as the external cladding and its support structure, along with the curtain walling. Recommending space frame construction for the external envelope to assuage DiA's concerns about cost, Werner Sobek sees the scope of their appointment expand. They are ultimately involved in many aspects of the project, including the space frame, the internal skin, the Pond Cafe at the site's south end, and the structural glass balustrades, taking on various responsibilities, including design, specification, documentation, monitoring, and supervision, with up to 20 staff involved. Bavarian construction specialist MERO-TSK is awarded the contract for the space frame, weighing 2,500 tons less than the structure originally proposed, and the Turkish firm Bilim Makina later installs it in nine months, which reflects its extent and complexity: MERO-TSK space frames are typically installed in six months. The space frame's blue paint finish became a Baku landmark, until it was eventually concealed by the Center's external cladding, and Bavarian specialist Lindner's internal skin. The glass curtain walls, supplied by Hueck Hartmann, were installed by a Turkish firm.

These specialists faced similar challenges of reconciling complex geometry with demands for quick erection, live and dead loads, and material expansion and contraction, working with a defiantly nonmodular design. The building has a single-movement joint separating concrete slabs, space frames, and other components into two sections. In addition, expansion and contraction of finishing materials, such as the external and internal skin, are visually suppressed or absorbed into uniform, if not always regular, panel joints and the extent of off-site fabrication is maximized to optimize quality control and precision. Nevertheless, elaborate interstitial secondary support structures are needed so the inner and outer skins can be set out accurately at their interface with the space frame. This involves labor-intensive site work, for example to fine-tune the fixing positions for the plates supporting the inner skin panels, many of which also need to be bent on site.

Our focus now shifts to the United Arab Emirates, where cladding manufacturer Arabian Profile develops the design of the fiberglass reinforced concrete panels for the plaza and the external envelope rain screen. Extruded panels have fiberglass embedded in their concrete matrix in three layers: the top and bottom with undirected, scattered fibers and the ones in between with bundles following the proposed form. With no steel reinforcement, panels can be slimmed down to 8–13 mm without losing their flexural strength. Arabian Profile floats the idea of making the rain screen panels, which outnumber those in the plaza by 4:1, out of

hollow fiberglass reinforced plastic instead, halving production times and trimming 80 percent of their weight. This passes muster with the project team, but Arabian Profile must demonstrate that the plastic panels can match the performance and appearance of their micaceous concrete siblings. Next, microchips are fitted to all 16,150 panels, so each can be traced, dramatically accelerating installation. Before all this has happened, Arabian Profile contracts London digital panelization specialist Newtecnic to develop 3D software.

Next to Turkey, where Sanset İkoor are exploring options to fabricate the auditorium interior, working with Ankara acoustic specialist Mezzo Studio. As more and more specialists in the region join the project, the Heydar Aliyev Center begins to rise from the ground and take shape, a conical concrete core sprouts up and is garlanded with steel flooring platforms, intriguing steel boot columns are craned in, then decking units—some to be bent on site before their waterproof membranes are welded together. Rain screen panels are bolted onto brackets before the wind can carry them away, access modules walk up the stairs and, after the structural balustrades are fitted, the services and plaza lighting are tested and commissioned in preparation for the Center's opening.