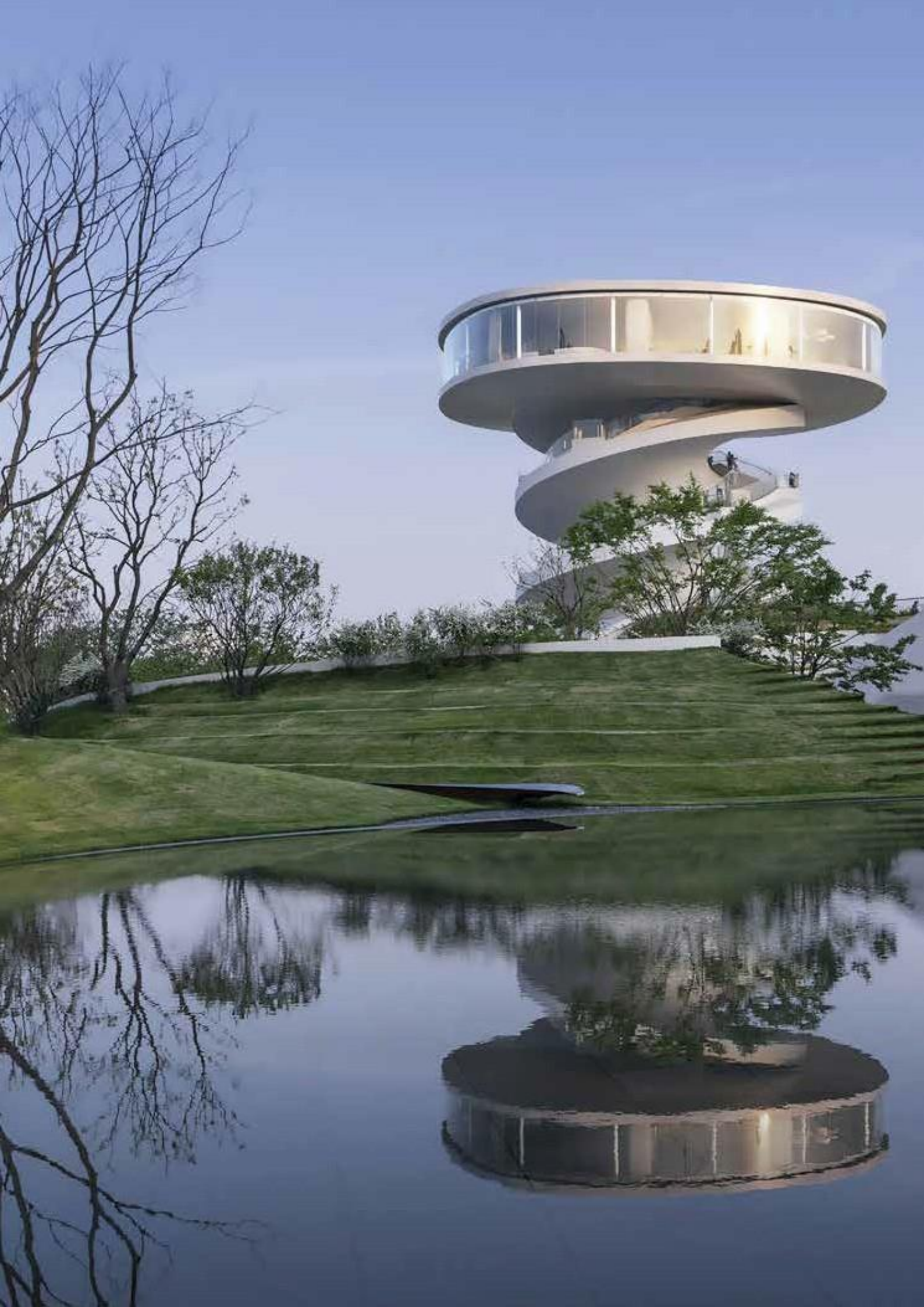
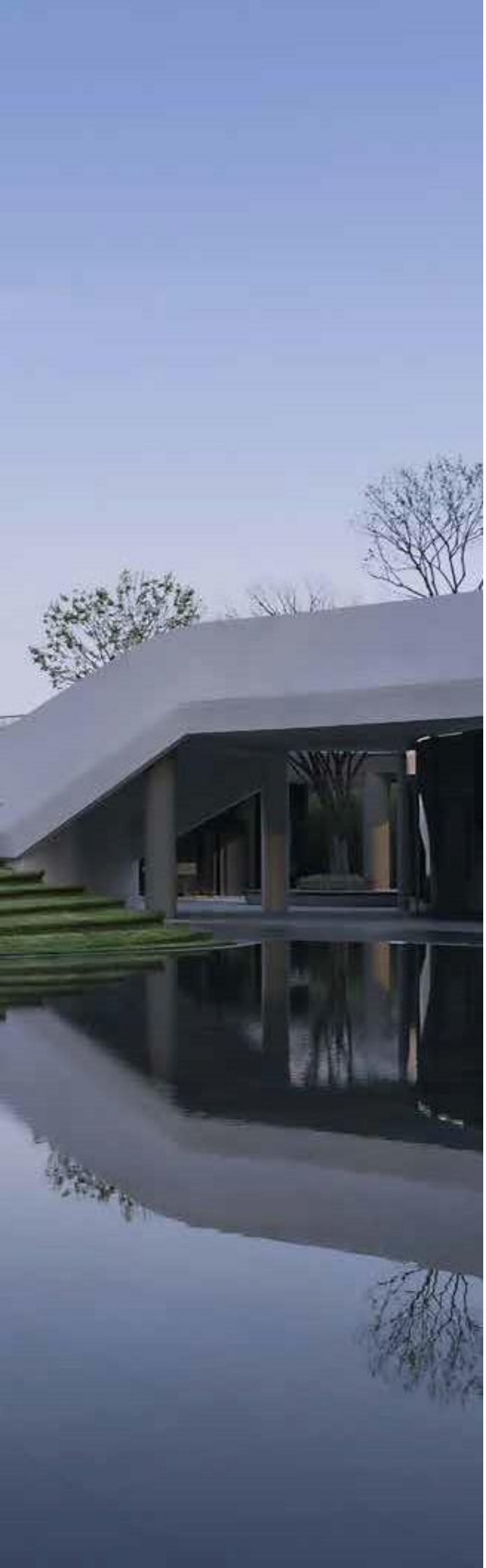
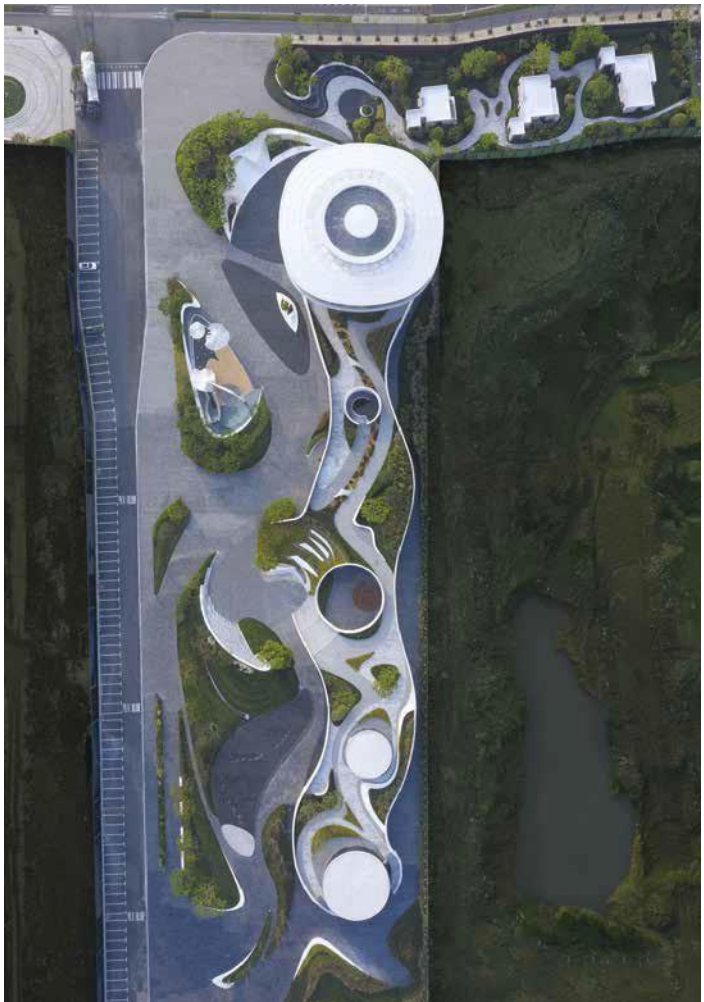




Snake in the wetlands

Nanchang Waves – Community centre constructed from glass-fibre reinforced concrete

The Nordic Office of Architecture based is Oslo recently completed a new, multi-purpose complex in the city of Nanchang in Jiangxi Province, China. The design of Nanchang Waves was inspired by the natural wetlands in the area surrounding the complex. The 5,844 square metre complex borders the Elephant Lake Wetlands Park and provides a striking spatial experience, whereby the built form and the surrounding landscape merge into one. The design focuses on the three natural elements of water, earth and sky, each of which represents a functional area: the forecourt, the commercial facilities and the observation tower. The double helix tower forms the main 3D element of the design and provides visitors with a 360-degree view along the length of the meandering building.



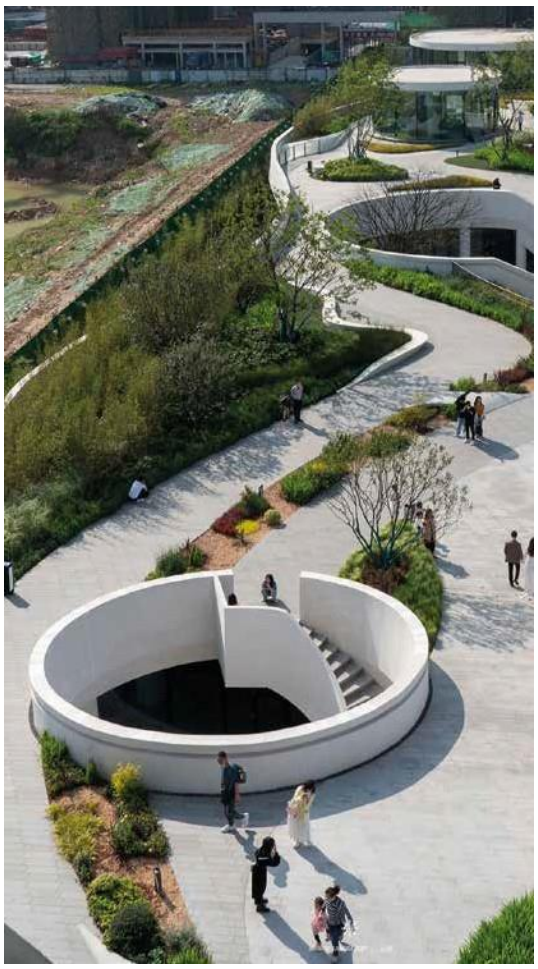
Outstanding architecture is a culmination of art, design and function. In other words, the best architectural examples make confident statements while working with the dynamics of their surroundings and serving a practical purpose. The new building by the Nordic Office of Architecture meets all of these criteria and a few more.

Located in the Chinese city of Nanchang in the province of Jiangxi, "Nanchang Waves" is used as a community centre that offers a wide range of activities on different structural levels and forms the heart of a large residential area. The multi-purpose space features function rooms, cafés, galleries and urban gardens.

The Nordic Office of Architecture is an architecture and masterplanning practice based in Oslo, which also has offices in Copenhagen, London and Reykjavik. The office focuses primarily on projects with a water theme. The concept for "Nanchang Waves" was derived from the surrounding watery landscape. In fact, from a distance the venue can actually be mistaken for a huge water park. Curved walkways resemble

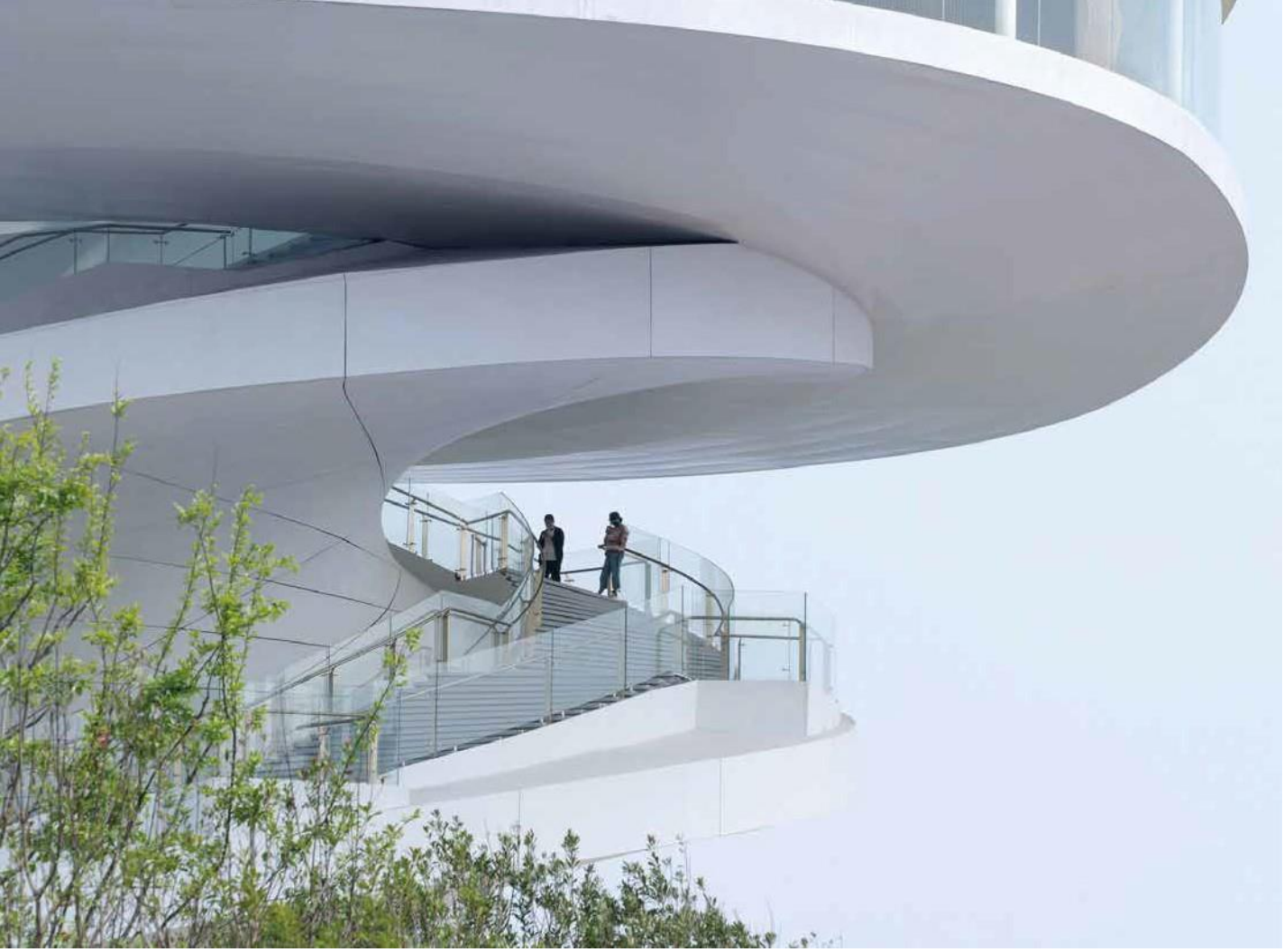
Photos: schran image for Nordic Office of Architecture

a meandering river, and the contours of the adjacent lake are reproduced in the rippling architecture. The Nanchang Waves Campus looks and feels incredibly spacious and airy. "Each of the landscape nodes includes functions for people from different age groups as well as offering an interesting and unforgettable spatial experience," explains the design team. The earth element is also reflected in the new facilities, especially in the most functional rooms.



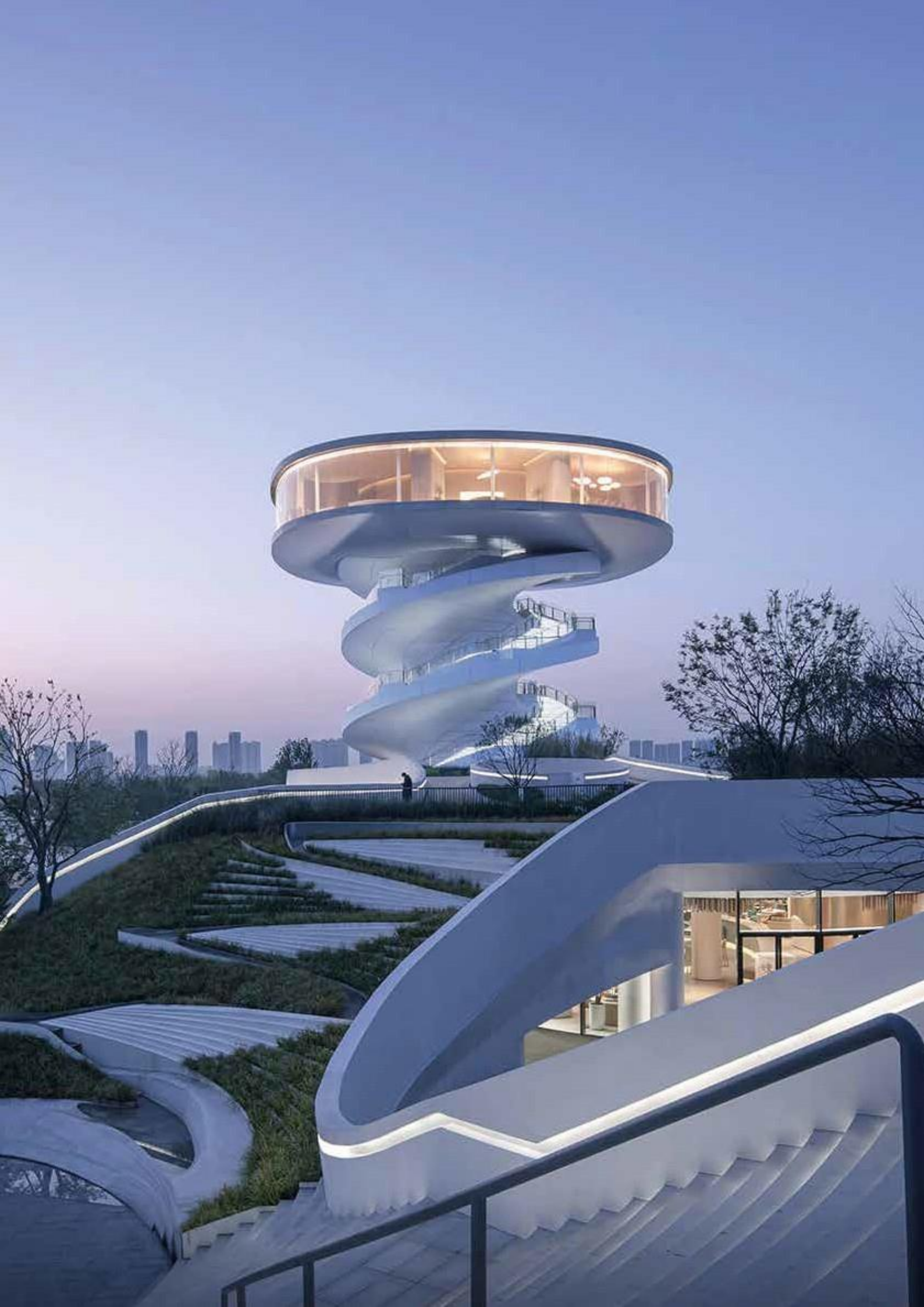
Expression of a region

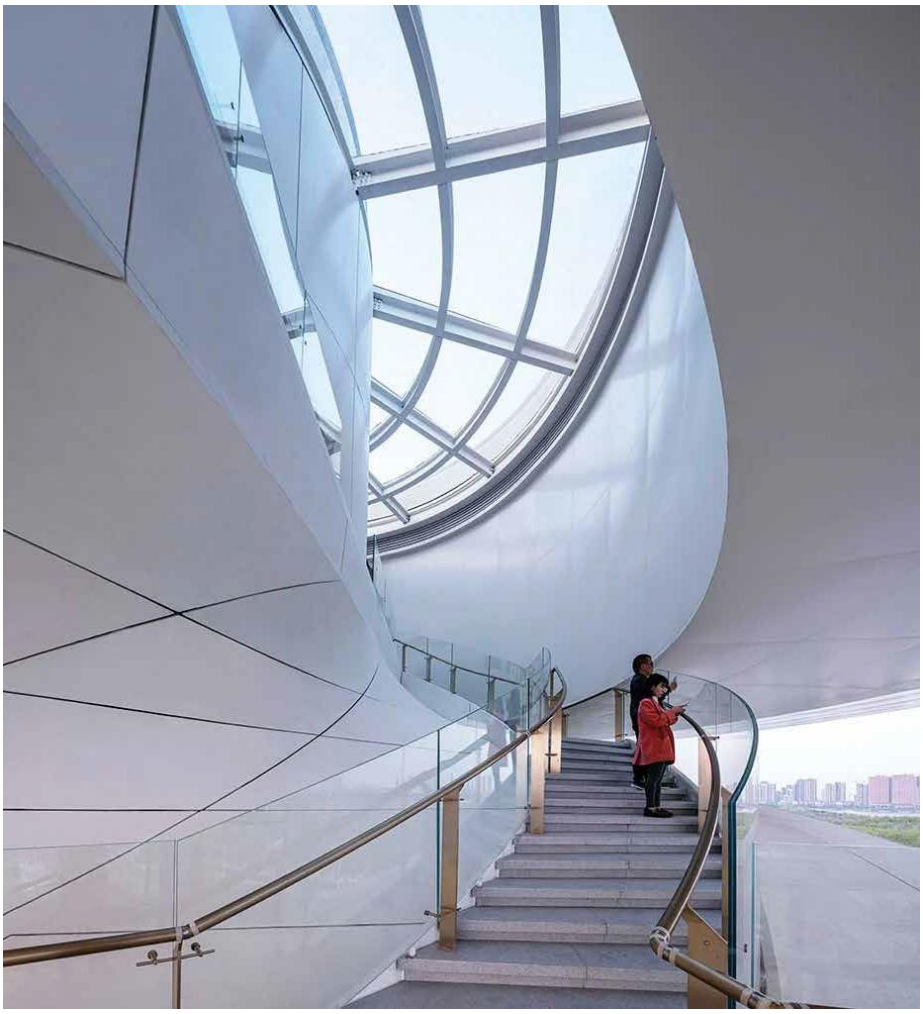
The landscape of the forecourt with its outdoor amphitheatre, which unfolds slowly and theatrically, extends beyond the general three-dimensional urban design. Accessible from both sides of the structure, the roof garden is positioned over a scattering of retail and commercial units, which accentuate the liveliness of the outdoor activity area at the front of the square.
The ensemble culminates in the dramatic observation tower, which serves as a contemporary landmark for the city. The double spiral structure represents "future living" and the new, modern spirit of Nanchang, as they combine to become the newest city landmark and upgrade the natural



landscape of the region. The panoramic gallery on top of the double helix structure faces the wetland, providing an all-round view of the neighbourhood. The UFO-shaped viewing platform perched atop a 7 m wide double spiral staircase forms the centrepiece of the tower. The 675 m² platform features other facilities such as cafés, offices, galleries, arenas for events and urban agricultural gardens for local schools. The interiors incorporate glass facades between the light wood ceilings and floors, and are furnished with egg-shaped chairs, glossy tables and decorative silver sculptures. The podium provides a total of around 3,000 m² of retail and recreational space.

Glass-fibre reinforced concrete elements made of white cement The peripheral steel support structure has a unique shape and consists of a series of curved and twisted steel components. The outer curtain wall comprises a number of arbitrarily curved GRC panels (glass-fibre reinforced concrete). As the main producer of GRC panels for the project, Nanjing BeilLiDa New Material System Engineering has already developed numerous innovative and patented GRC production and assembly systems for similar complex geometrical projects over the last few years, such as the Changsha cultural centre by Zaha Hadid, which are ideal for non-linear architectures. Precast component manufacturer Beilida devised solutions capable of overcoming any difficulty and meeting every requirement: Suitable construction technology was developed for the hyperbolic GRC claddings in order to generate a high-precision, fully secured, specially shaped GRC claddings that can be adjusted and removed. Digital hyperbolic shape production technology for creating the parametric design and controlling the machining precision of the GRC shape had to be invented through a combination of digitisation and numerical control. A three-dimensionally adjustable connection and installation component for rendering the connection between the rear steel framework and the main structure more flexible also had to be developed as well as equipment for spraying high-performance GRC panels to produce high-strength concrete and an easy-to-operate device for installing and removing the curtain wall panel to complete the installation and removal of the GRC panel.

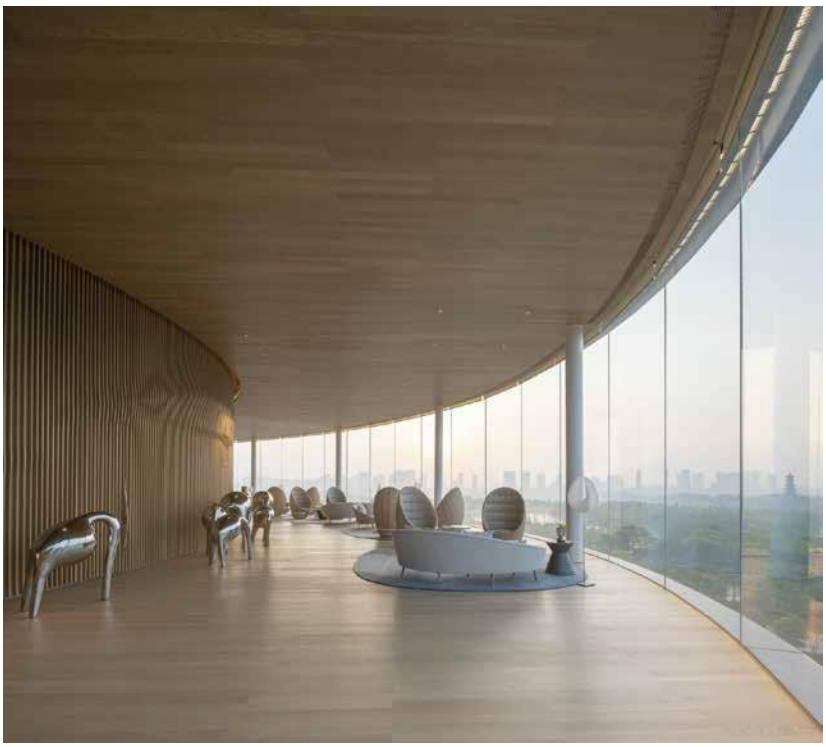


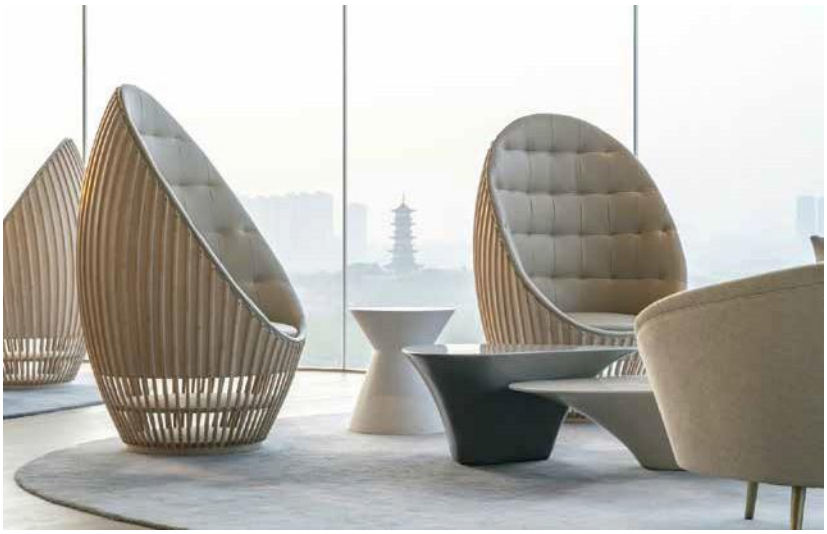


Locking joints were integrated so that the entire structure could be divided into multiple independent systems. The joints were installed in each area to resolve the technical problems associated with the installation of a large hyperbolic, single-layer steel structure.

The implementation of the hyperbolic GRC claddings with a high degree of durability, high precision and all the relevant screw connections as well as adjustable and removable openings through the bottleneck of the original GRC cladding has set a new milestone in the development of architectural facade. The use of BIM technology has allowed the sharing of design, manufacture, installation, operation and maintenance data. It has also highlighted the organic integration of BIM, IOT, large data and other information technologies with advanced construction technology, which reflects the current level of innovation and reform in the construction industry.

Aalborg White 52.5 cement, manufactured at the Cementir factory in Anqing, Anhui, China, was the white cement specified for the manufacture of GRC products for this project. Since white cement has an extremely high degree of purity and stability, GRC manufacturers pass on the high performance and colour stability of their end products to their end customers. The high degree of purity and stability of white cement is the key for all coloured products – even architectural products with a grey cement basis are often manufactured using white cement to achieve a uniform surface colour. The chemical stability of the cement plays a decisive role in the quality of the final concrete product. All over the world, cement is usually combined with different types of chemical additive in almost every application. These additives have become more and more effective over the years and have an enormous impact on the concrete industry. This has further increased the need for skilled workers and the implementation of advanced quality





control systems in the manufacturer's factory. A sprayed GRC usually needs to be extremely robust in order to maintain its integrity because it is mixed at high speed, stored "stationary" in the tank, pumped, sprayed and smoothed.

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Structural engineering
Rambøll Gruppe A/S, DK-2300
Copenhagen S www.ramboll.com

Glass-fibre reinforced concrete
Nanjing BeiLiDa New Material System Engineering co., Ltd., www.beilida.com

White cement
Aalborg Portland (Anqing) Co., Ltd., www.aalborgwhite.com