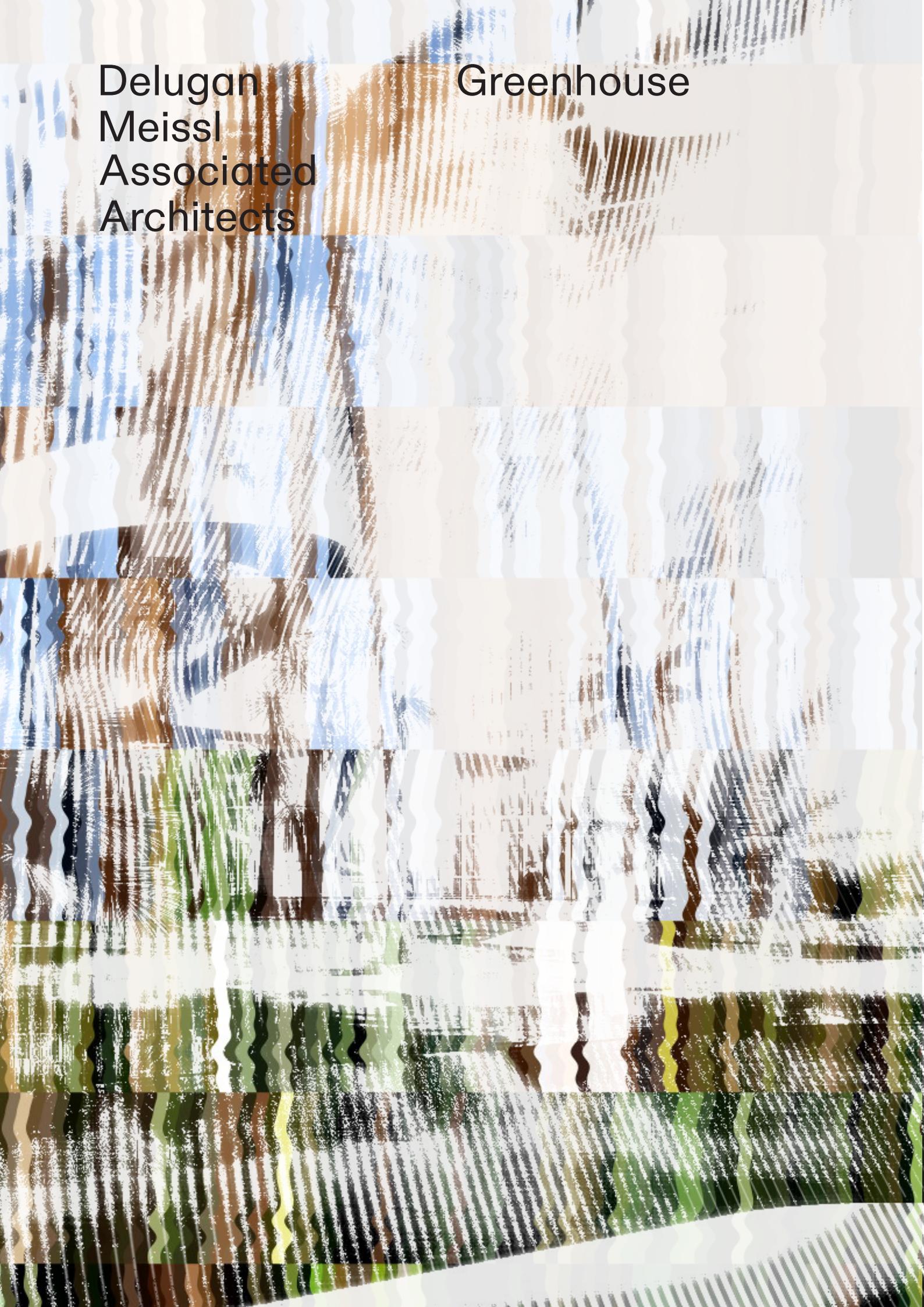


Delugan  
Meissl  
Associated  
Architects

Greenhouse



# Projects

## Greenhouse

05	Taiyuan Botanical Garden	Taiyuan, China
25	Expo Cultural Park	Shanghai, China
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85	Greenhouse Ganzhou	Ganzhou, China
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## Office Profil



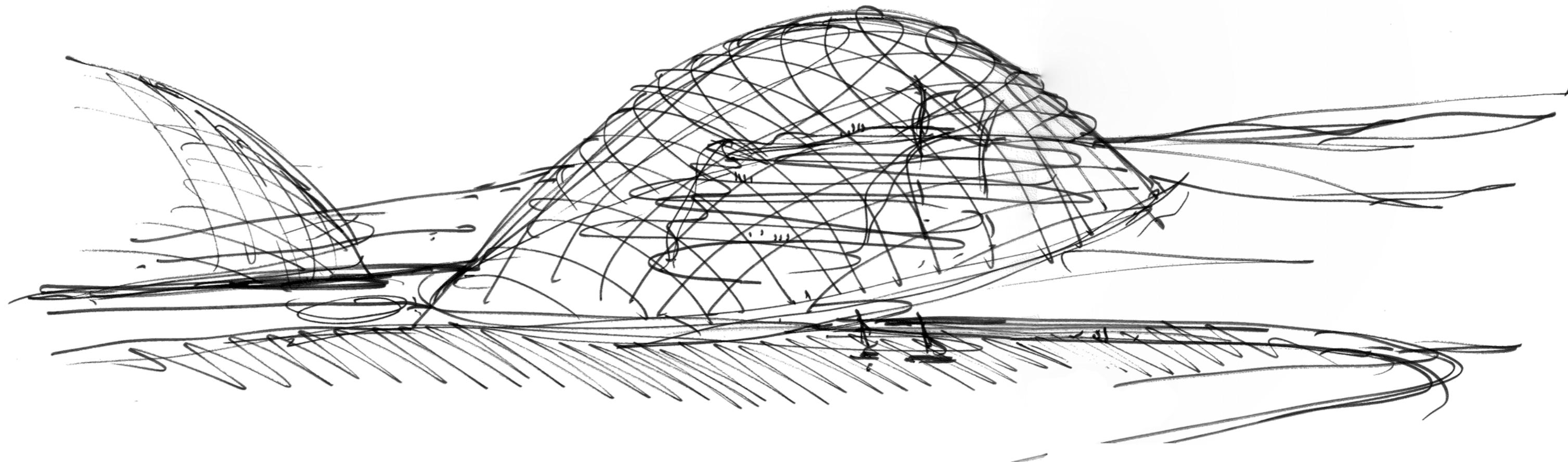
Taiyuan Botanical  
Garden  
Taiyuan, China

Taiyuan Botanical Garden  
Taiyuan, China

Small Dome  
Height 12 m  
Size (diameter) 43 m

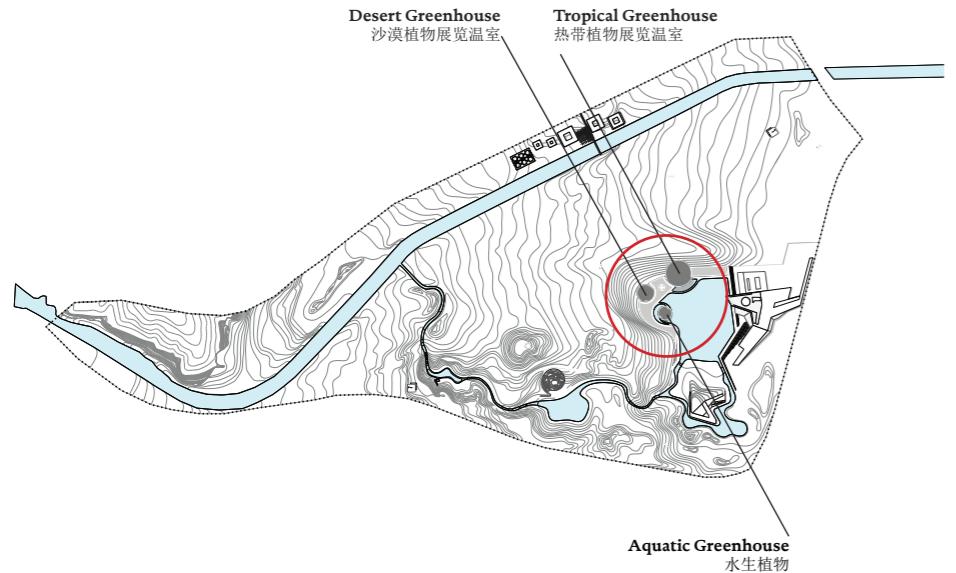
Middle Dome  
Height 21 m  
Size (diameter) 60 m

Large Dome  
Height 30 m  
Size (diameter) 95 m



# Taiyuan Botanical Garden

## Taiyuan, China



The project was launched with the ambitious objective of transforming a former coal-mining area into a landscape park, which is not only a model for the landscape design that is so essential in China, but also contains a building infrastructure that can be used for researching into and offering people access to and information about natural ecosystems. The politically stated need to create high-quality leisure areas in or close to cities and to find ways of controlling the resulting large numbers of visitors formed the basis for the definition of a spatial programme. This envisaged not only the creation of the landscape park itself, but also the construction of a central entrance building with a nature museum and administration facility, three greenhouses, a restaurant, a bonsai museum and a related research centre with a library and staff accommodation.

The centrepiece of the buildings, which are very precisely inserted into the modelled topography, consists of three greenhouses, which were realised as three hemispherical timber lattice domes.

The construction of these greenhouses required the pooling of technical knowhow in the areas of energy design, thermal performance, structural integrity and glazing as well as assembly and logistics. With a free span of over 90 metres, the broadest of the three domes is one of the largest such timber lattice structures worldwide. All three domes consist of double-curved laminated timber beams, which are arranged in two or three intersecting layers.

The domes are glazed with double-curved panes of glass, some of which include openable windows. The main beams of the timber structures that, from above, resemble shells, are tightly bunched together on the north side of the base and fan out towards the south, creating a structurally varied translucency that optimises the solar gain. A detailed knowledge of local climatic conditions, the thermal demands inside the structure and the structural efficiency and availability of suitable constructional resources were key parameters for successfully minimising the ecological footprint.

**CATEGORY**  
Cultural  
Exhibition  
Greenhouse

**ADDRESS**  
Jinyuan District,  
Taiyuan City, China

**START OF PLANNING**  
2015

**START OF CONSTRUCTION**  
08/2017

**COMPLETION**  
02/2021

**GROSS SURFACE AREA**  
54.600 m<sup>2</sup>

**CONSTRUCTION VOLUME**  
329.861,00 m<sup>3</sup>

**SITE AREA**  
182 hectares

**CLIENT**  
Botanical Garden Taiyuan

**CONSULTANTS**  
Coordination  
Yiju Ding

**ARCHITECTURE**  
Executive planning  
Institute of Shanghai  
Architectural Design &  
Research (Co.,Ltd.)

**STRUCTURAL ENGINEERING**  
Bollinger + Grohmann  
Ingenieure

**FAÇADE**  
Bollinger + Grohmann  
Ingenieure  
HVACR/Electrics  
Cody Energy Design

**LANDSCAPE ARCHITECTURE**  
Beijing BLDJ Landscape  
Architecture Institute  
Co.,Ltd.

**LANDSCAPE DESIGN**  
Greenhouse  
Valentien+Valentien  
Landschaftsarchitekten und  
Stadtplaner SRL

**PHOTOGRAPHER**  
CreatAR





DMAA's very early decision to use timber as widely as possible in this project permitted not only extensive prefabrication but also a high quality of execution, while also opening up a rich seam of potential historical associations.

The entrance building, which is approached from the access road via a large courtyard, leads visitors via an open stair that passes through a circular opening in the slab onto a huge roof terrace, from which they can oversee the entire park and become aware of the building's twin function as an interface between architecture and landscape. The cantilevered viewing platform soars above the area of water at the heart of the park and directs visitors towards the three greenhouses in the botanical gardens.

The terraces of the bonsai museum, which are laid out in concentric circles, provide the constructional framework for this precise presentation of an ancient Far Eastern aspect of Garden Art. The path taken by visitors reflects the principle of a domesticated natural landscape. Just like the mighty domes of the greenhouses, the base of the bonsai museum also reacts dynamically with the modelled topography of the landscape and the surface of the pool.

The research centre contains laboratories, studios, office buildings, workshops, meeting rooms, lecture rooms and a library and is broken down into a number of pavilions of different sizes, which are linked together by a common connecting block at ground floor level. The sculptural articulation of the overall concept is based on traditional Chinese timber roof structures, which it attempts to do justice to by reinterpreting their structural and geometrical logic. The restaurant and tea house is a perfect example of the application of the principles of piled and interwoven load-bearing layers, of creating steps and scale by adding or removing layers close to supports or edges and of playing with proportional relationships between structure and space.

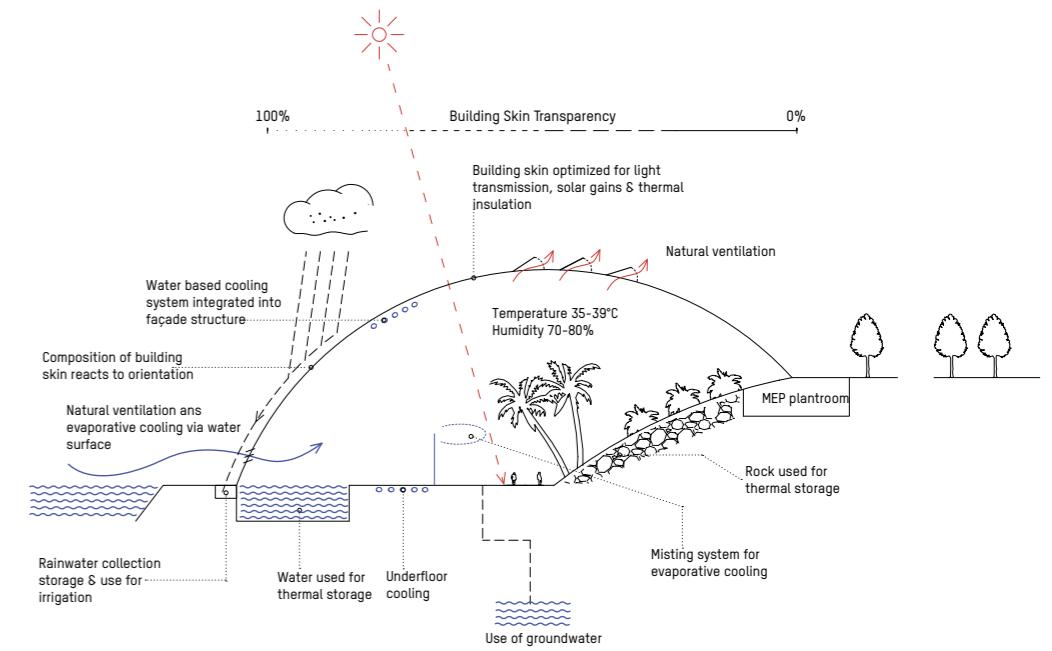
The constant dialogue between inside and outside and the architecturally subtle articulation of the interface between architecture and landscape are reflected in the sculptural modelling of the landscape park, which merges organically with the built infrastructure.



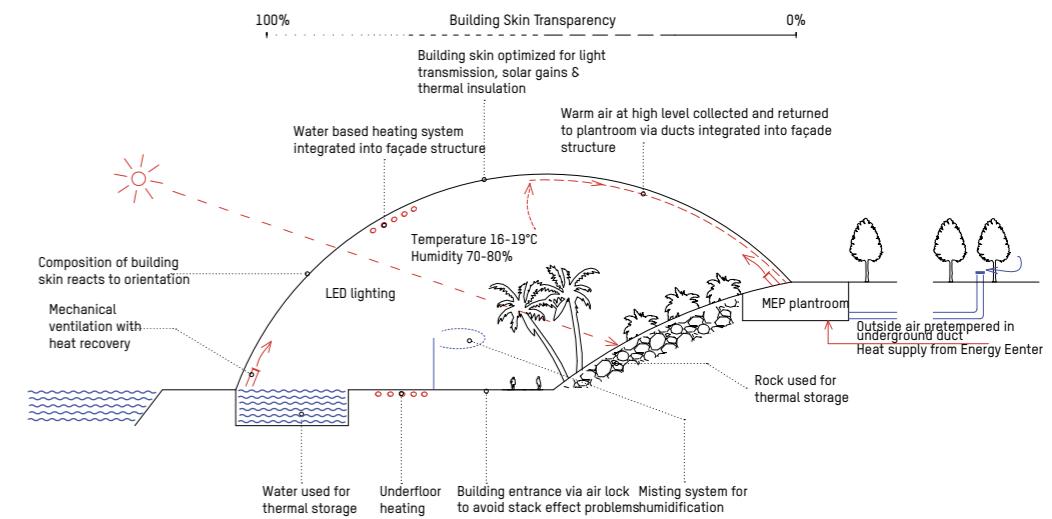


# Energy Concept

Tropical Greenhouse Summer

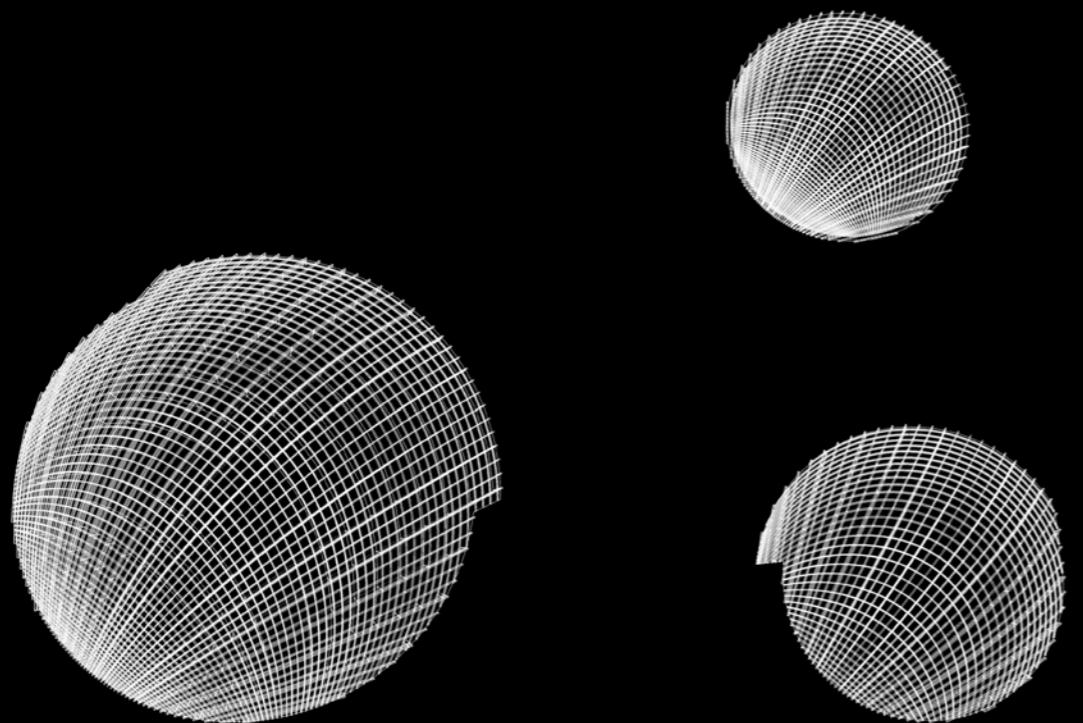


Tropical Greenhouse Winter



Energy design  
Prof. Brian Cody

# Long-Span Timber Gridshells



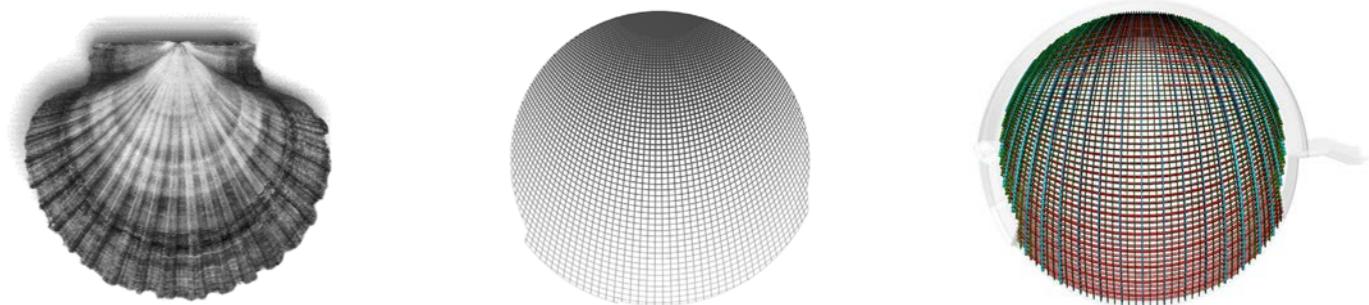
The challenge we faced at the onset of the project was to pool the necessary technical expertise and to gear the design development towards the architectural principles of our scheme. The particular areas of expertise include energy design and thermal performance, structural integrity and glazing, as well as drawing construction and logistics. To acquire an intimate understanding of local climate conditions, the thermal requirements inside the structures, the structural performance and availability of suitable construction resources are the essential components to achieve the overarching goal of minimizing the ecological footprint of the project. Nature is the main actor here.

## Climate Control

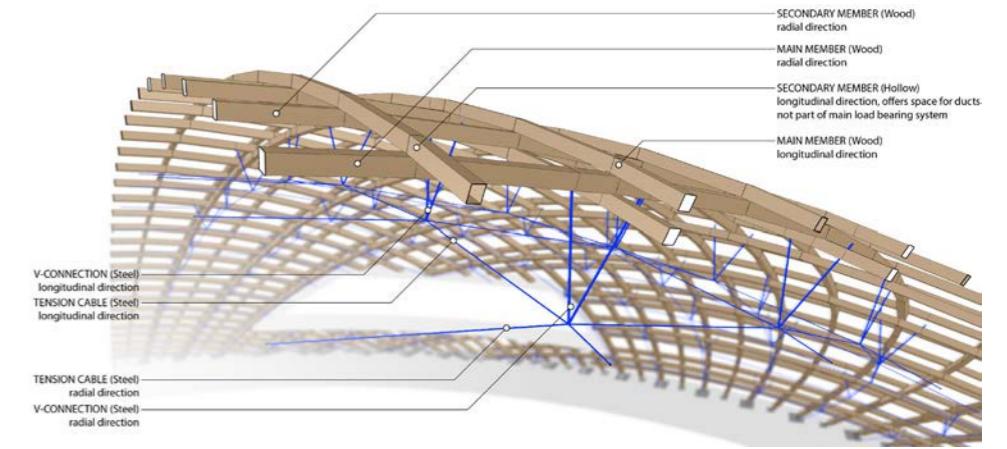
The building envelope is optimized with regard to light transmission, solar gains and heat loss and is composed of individual modules, which are specified according to their particular position in the envelope and orientation to the sun. The degree of transparency gradually changes along the north-south axis of the building, varying from highly transparent on the south facing areas to completely opaque on the north side. Other energy design strategies include optimal building orientation, specially developed climate control systems which are integrated into the façade design, automatically controlled natural ventilation, evaporative cooling, high efficiency sensible and latent heat recovery systems, thermal rock stores and modeled topography for energy storage and biomass fueled combined heat and power plant (CHP).

## Structural Analysis

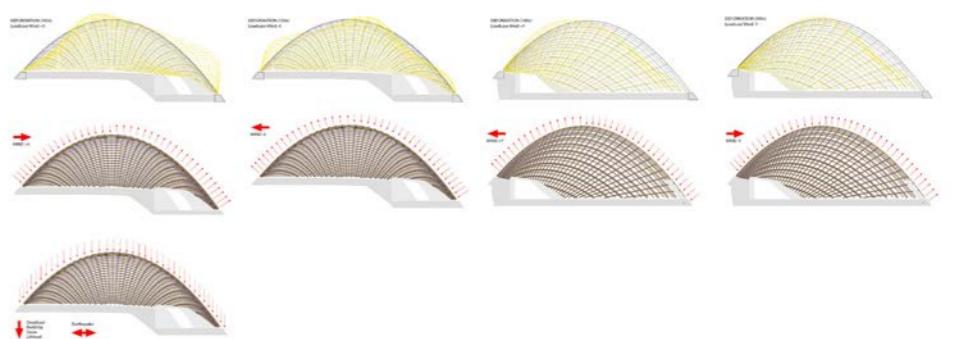
The largest of the three domes has a clear span of over 300 ft, making it one of the largest timber gridshells worldwide. All three parabolic gridshells comprise doubly-curved glulam beams, arranged in two or three crossing layers. The domes are glazed with doubly-curved glass with operable windows in some areas. When viewed from above the timber structures resemble seashells, with the primary members closely bunched on one end and then fanned out across the surface of the domes, driven by a desire to optimize solar gains by creating a gradient in skin transparency. The geometric generation of these domes presented a particular challenge, as they are not spheres. In order to structurally optimise the doubly curved geometry, the team had to consider all of the constraints, including daylighting, structural performance, shipping, and fabrication and pre-assembly.



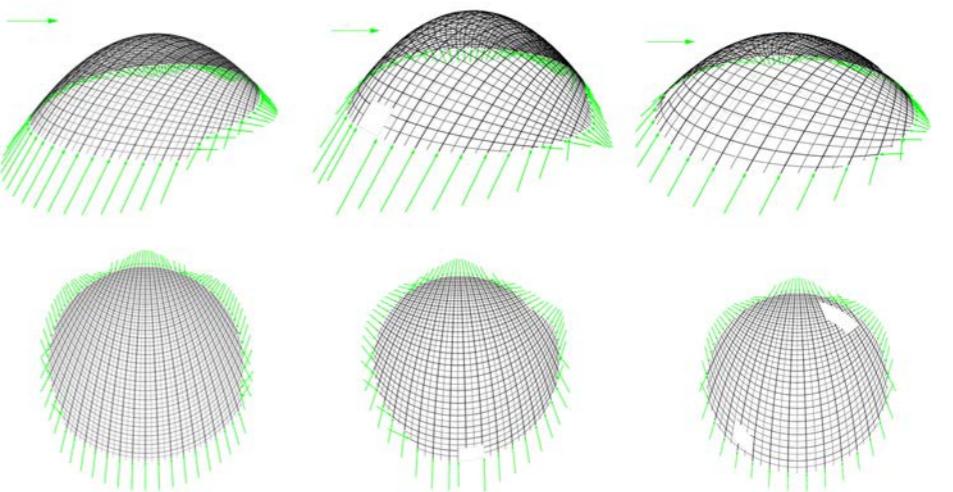
A clamshell is the paragon of the structural design for the domes  
© Bollinger + Grohmann



© Bollinger + Grohmann



Loads, load cases and respective deformation shapes of desert  
© Bollinger + Grohmann

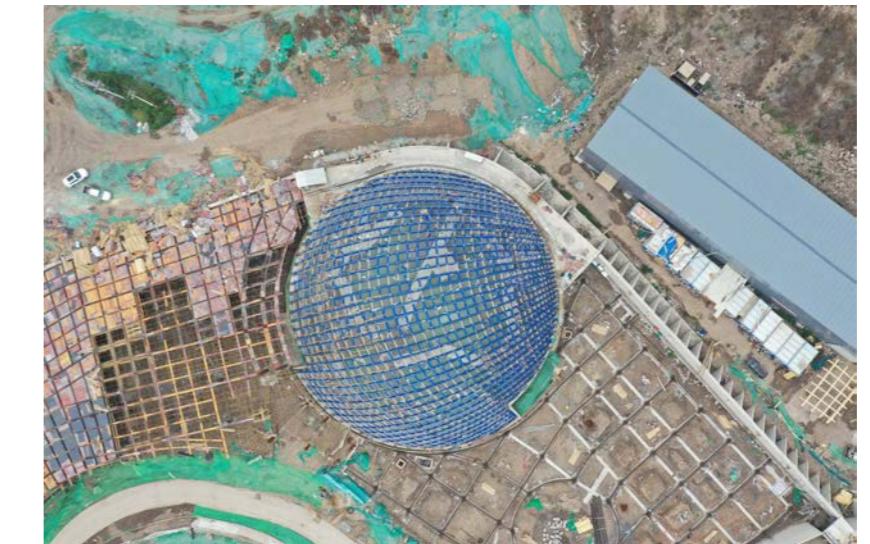


Reaction forces on the supports  
© Bollinger + Grohmann

# Construction

The foundations and concrete ring beams, complete with cast-in steel plates, were constructed over the course of several months prior to the arrival of the glulam. StructureCraft carpenters led the installation process working closely with SKF construction crews. Each gridshell was discretized into panels that could be pre-assembled on site or in a nearby warehouse and then trucked and craned into place. The entire footprint of each dome was filled with temporary steel scaffolding, which was primarily used to provide access to all points of the dome surface, and to provide lateral support for the panel support columns.

The preassembled panels were craned into place, and set on the custom adjustable support points. After the main panels were erected, the rest of the connections were in-filled piece by piece - a process which helped to minimize errors in construction, and provided sufficient tolerance to ensure that all pieces could be accurately fit together. After completing the glulam structure, key survey points on each dome were recorded. Then the dome was de-proped and the scaffolding was removed, and then the survey points were rechecked. This process continued for the small and medium domes several times while the glazing was installed to check on any significant settlement or deformation of the glulam structure.





# Expo Cultural Park

## Shanghai, China



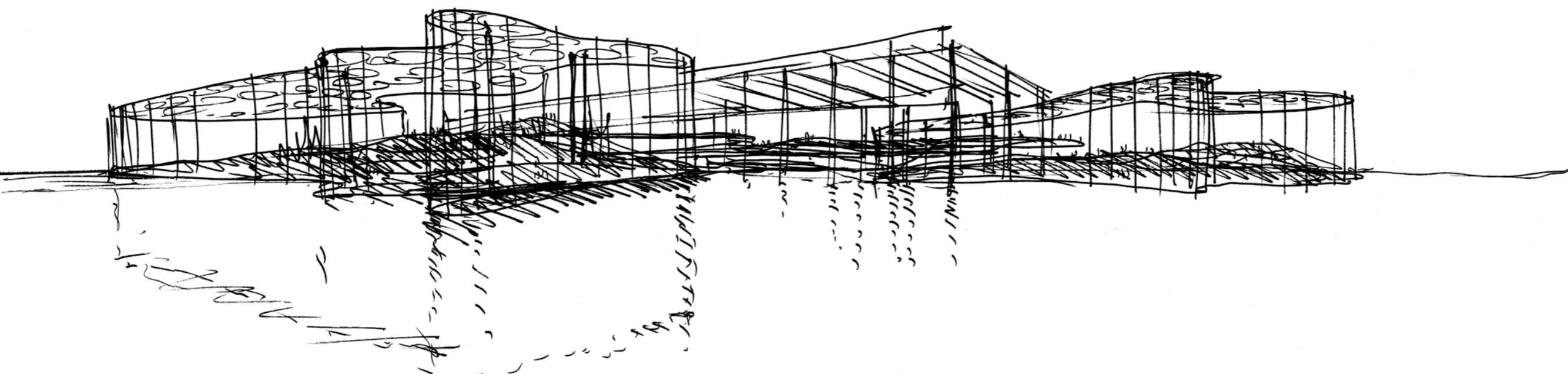
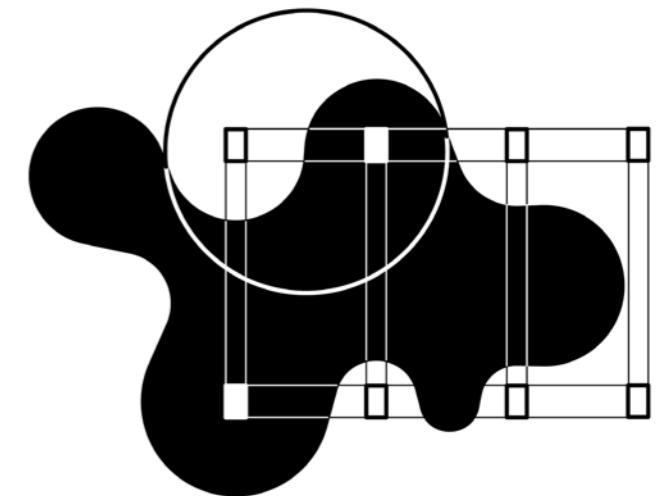


# Expo Cultural Park Shanghai, China

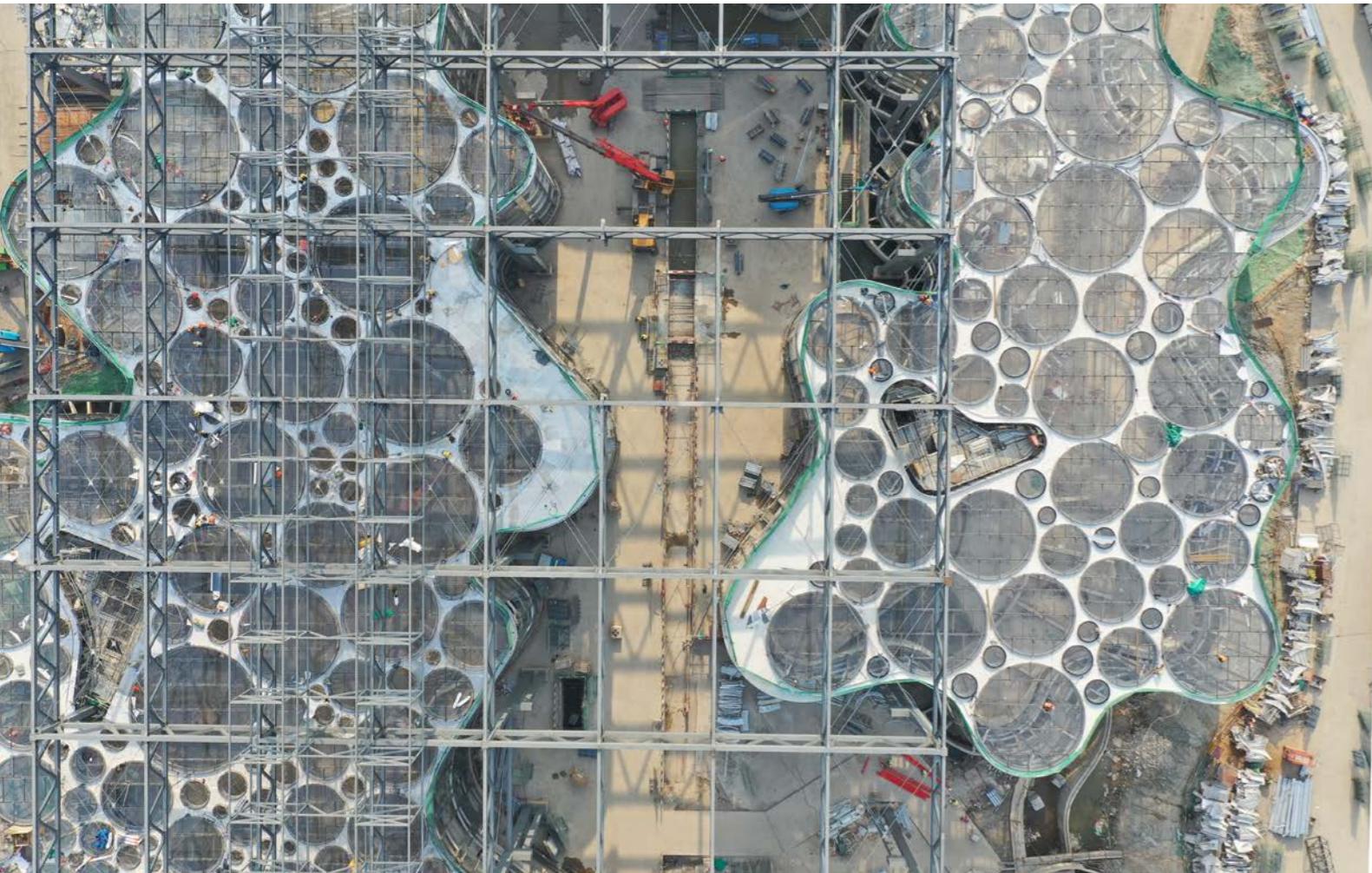
DMAA's project for the Expo Cultural Park in Shanghai was the winner of a competition that, in a similar way to Althan Quartier in Vienna, challenged designers to address the existing built substance, in that it required the incorporation of a series of greenhouses. The project envisages the retention of an old factory space as the distribution zone of a complex that offers greenhouses with a range of vegetations and climatic zones, a visitor centre and a number of restaurants and social areas and covers a total of 41,000m<sup>2</sup> of usable space.

The concept, which was designed in line with the high ecological standards of a zero-energy building, is also reflected in the gentle and harmonious way in which it merges into the surrounding landscape park. The large area of water surrounding the greenhouses both provides cooling in the hot summer months and is home to a photovoltaic plant that sits just a few centimetres below the surface of the water and, together with the additional areas of photovoltaic panels on the roof of the existing factory, provides the energy required to control the various climatic zones.

The principle of dual energy that underlies the Chinese philosophy of "Yin and Yang" provided the starting point for the dialogic interplay of the modular and linear structure of the existing factory and the individual, organic 35-metre-high greenhouses, which have circular rooftop openings of different sizes and are organically woven into the existing structure.

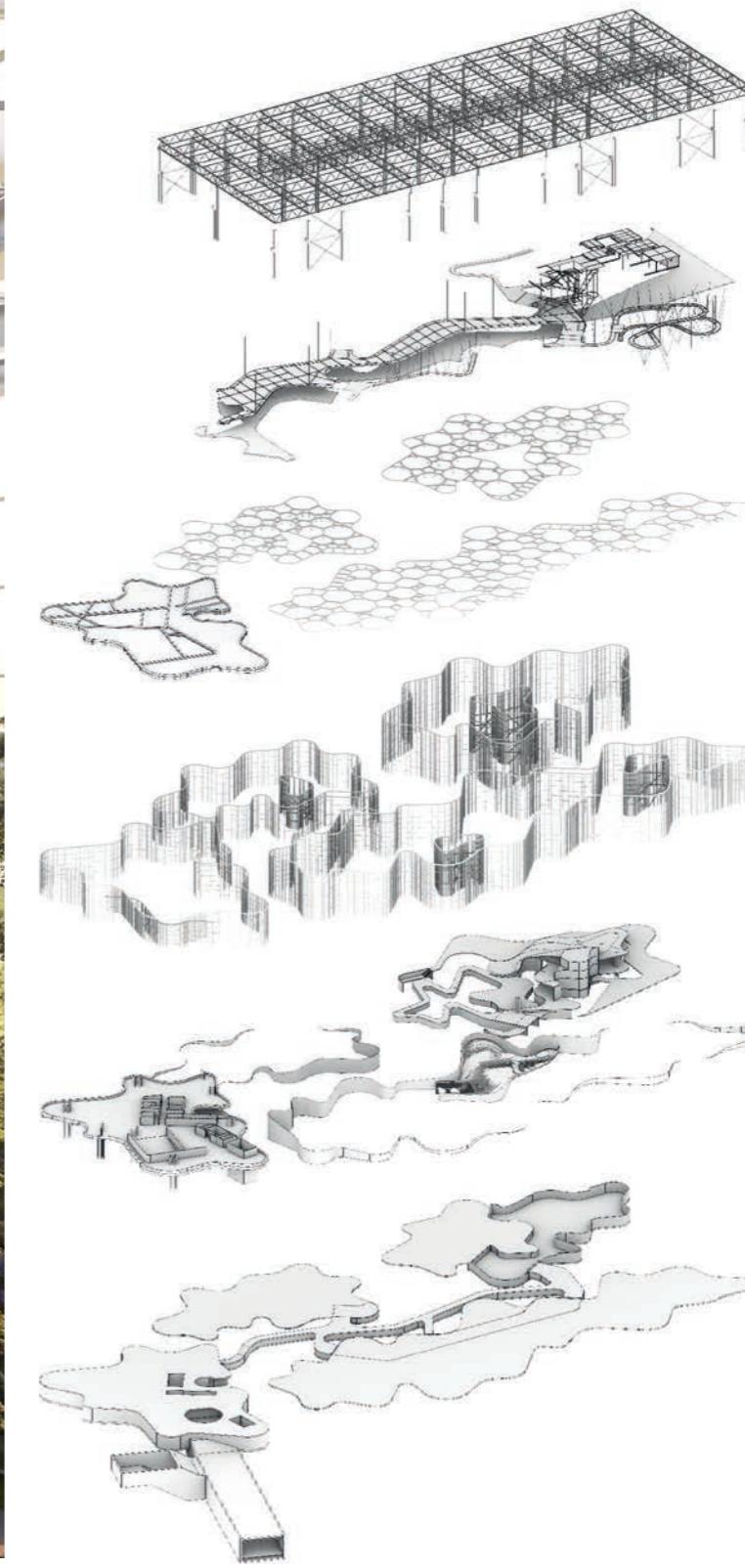


# Expo Cultural Park Shanghai, China



CATEGORY	COORDINATION / LANDSCAPE DESIGN
Cultural	Yiju Ding
Greenhouse	
Landscape Design	
ADDRESS	EXECUTIVE PLANNING
Shanghai Expo Cultural Park	SIADR Co.Ltd
Pudong Xinqu, Shanghai	STRUCTURAL ENGINEERING
COMPETITION	Bollinger + Grohmann ZT GmbH
1st price	ENERGY DESIGN
START OF PLANNING	Transsolar Energietechnik GmbH
03/2019	
START OF CONSTRUCTION	
01/2020	
COMPLETION	
2023 (estimated)	
GROSS SURFACE AREA	
41.000 m <sup>2</sup>	
CONSTRUCTION VOLUME	
340.000 m <sup>3</sup>	
SITE AREA	
47.000 m <sup>2</sup>	
(within the whole Park)	
HEIGHT	
35 m	
NUMBER OF LEVELS	
3	
NUMBER OF BASEMENTS	
1	

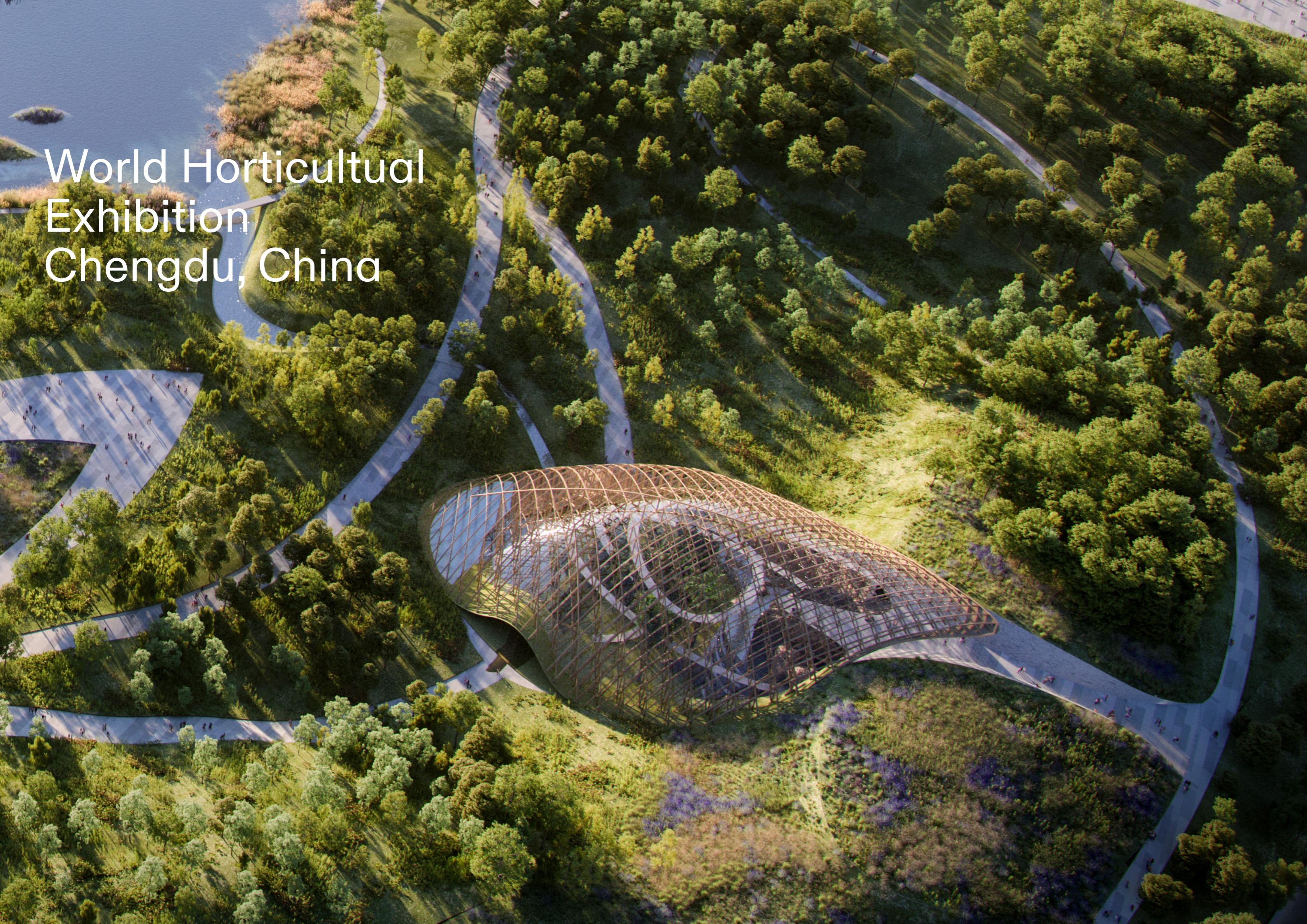




Exploded Isometric of the different components of the project  
© Bollinger + Grohmann





An aerial photograph of a modern urban park. The park features a large, curved glass and steel structure, possibly a conservatory or a large greenhouse, with a complex lattice framework. The surrounding area is filled with lush green trees and manicured lawns. A paved walkway or driveway curves around the structure and the park. In the background, a body of water is visible. The overall scene is a blend of natural greenery and modern architecture.

# World Horticultural Exhibition Chengdu, China

# World Horticultural Exhibition

## Chengdu, China

Plant pavilion is a bamboo or steel constructed dome structure integrated into a hillside on the northern east side of the plot. In order to accommodate plants and trees higher than 24m as the design limit, the following design proposes to excavate 12m of depth and use the same soil to form a hill as integral part of visiting experience, creating up to 33m of clear height inside the dome.

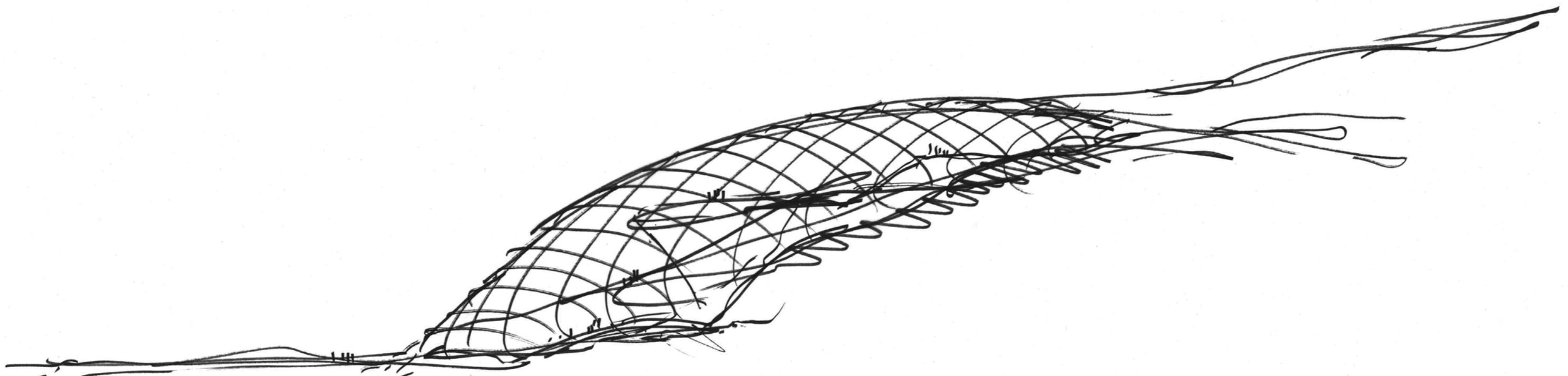
Pavilion is oriented to the south to provide the optimal sun exposure with the hill on the northern side. There are three access points, one on the higher level (from the top of the hill) and two on the lower side connecting visitors to existing walkway of the park. Entering from the top of the hill the visitors are greeted at the Entrance Platform with the panoramic balcony offering views of the whole dome and park in the exterior. From the cantilevering balcony visitor is taken next to the upper lake with the waterfall to the beginning of the experience walkway ramp leading to lower levels. Ramp takes the visitors

from the top of the trees, seeing the bird's perspective all the way down to the roots. On the way down ramp also cuts through the waterfall into the dark Grotto hosting completely different natural environment with spectacular light show supported by bioluminescence. From the second lake level at the height of the grotto, the river is cascading down through the terraces showcasing different plant families all the way to the lake number 1 bordering to exterior and continuing into the main river outside in the park.

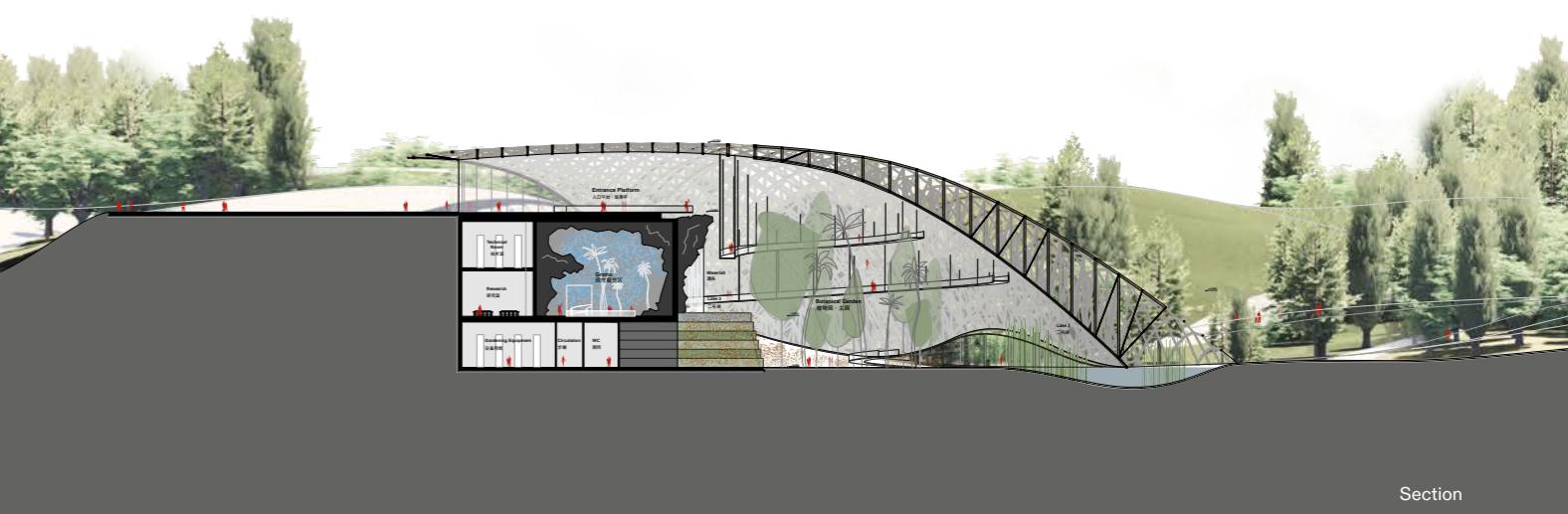
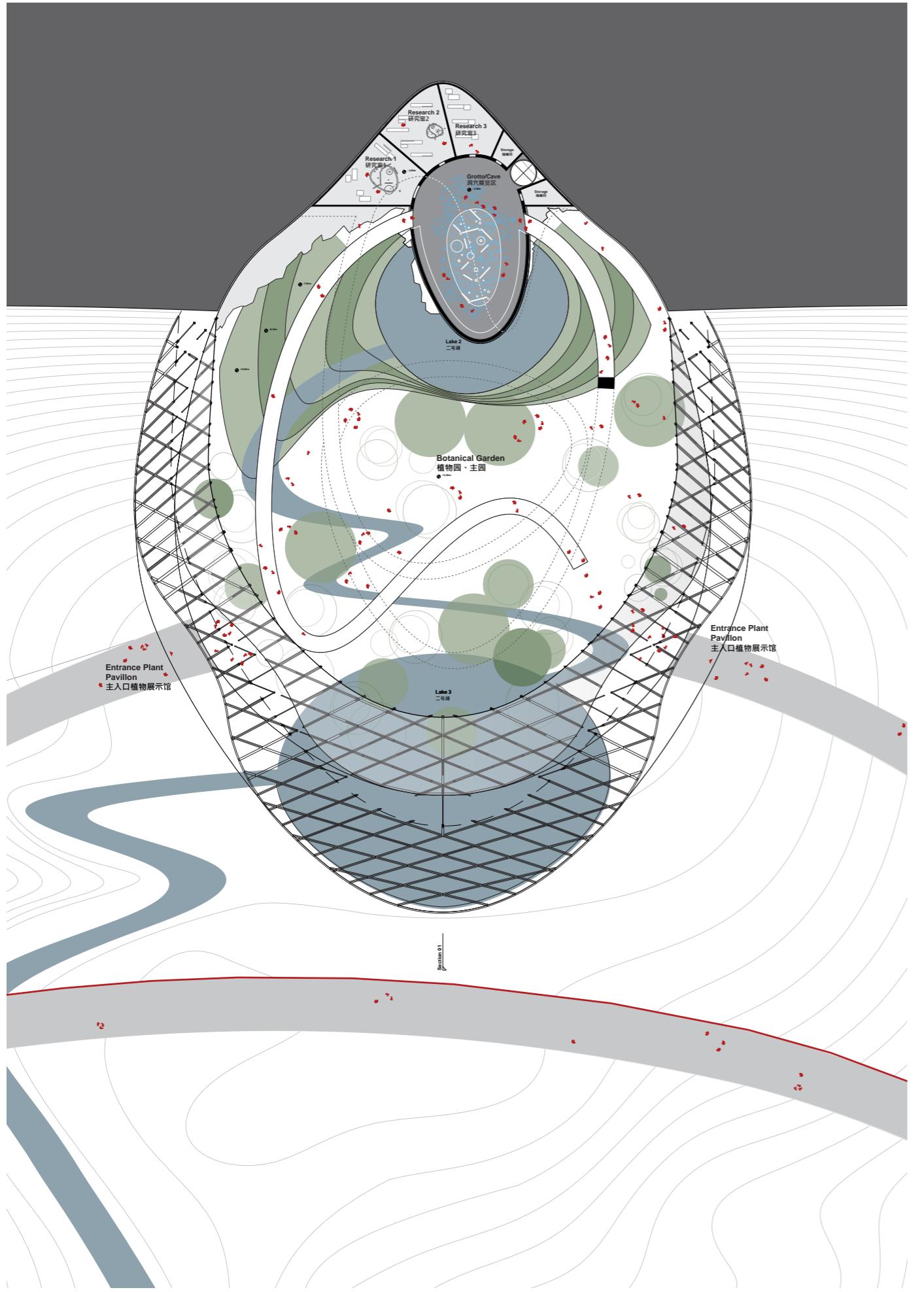
Besides the walking path through plants and river on the ground floor there are also spaces for gardening equipment, lavatories and storage rooms. On the second floor there are besides grotto also research spaces and technical room.

Not only is the dome spectacular in its shape floating above the landscape it is also very impressive structure, done in bamboo or steel, either way it is definitely making a mark.

CATEGORY  
Cultural  
Exhibition  
Greenhouse  
Landscape Design  
ADDRESS  
Chengdu, China  
COMPETITION  
03/2022  
GROSS FLOOR AREA  
7,045 m<sup>2</sup> (Plant Pavilion)  
SITE AREA  
1,777,765 m<sup>2</sup>  
BUILT-UP AREA  
126,392 m<sup>3</sup> (Plant Pavilion)  
VISUALIZATION  
Toni Nachev  
CONSULTANTS  
Coordination  
Yiju Ding  
STRUCTURAL  
ENGINEERING  
Bollinger+Grohmann



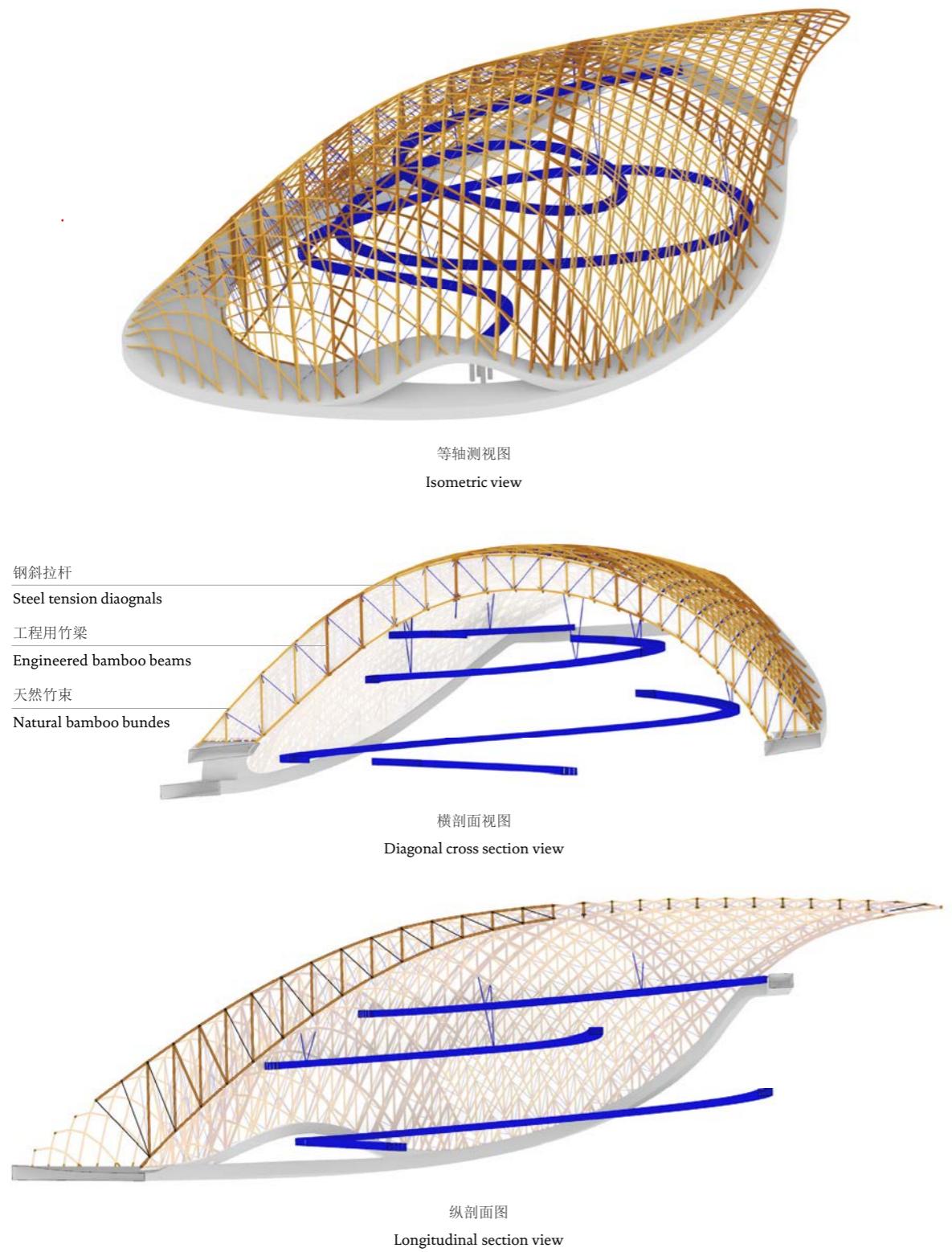


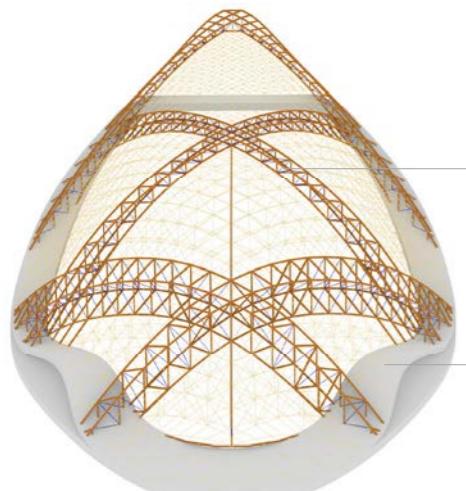






# Structure Concept



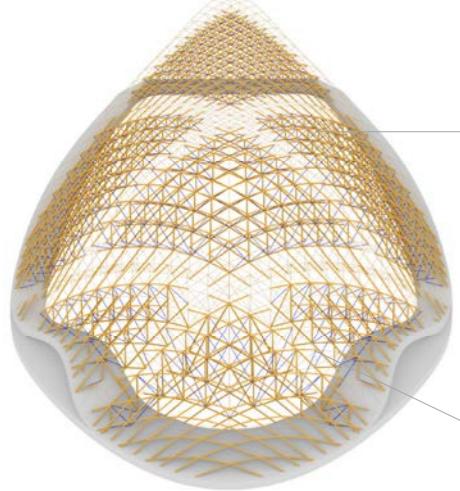


主桁架系统  
Main truss axes

300/300mm 工程竹梁  
至 400/400mm

Engineered bamboo beams  
300/300mm  
to 400/400mm

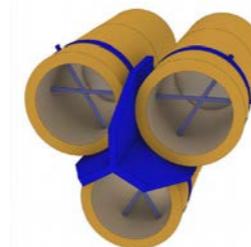
混凝土拱  
Concrete Arc



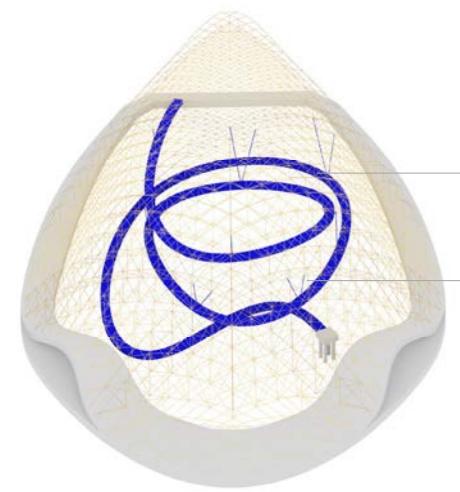
天然竹束  
Natural bamboo bundles

竹束的空间桁架, 每个竹束有3  
或4根  
带有钢连接件和灌浆端腔

Space truss of bamboo bundles  
with 3 or 4 stems each  
with steel connectors and  
grouted end cavities



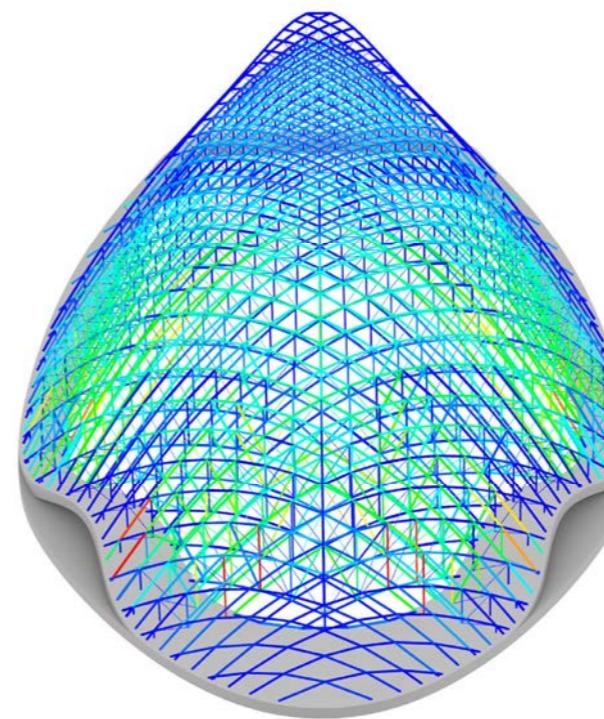
玻璃幕墙连接节点  
Facade connection option



吊挂钢结构步道  
Steel Suspended Pathway

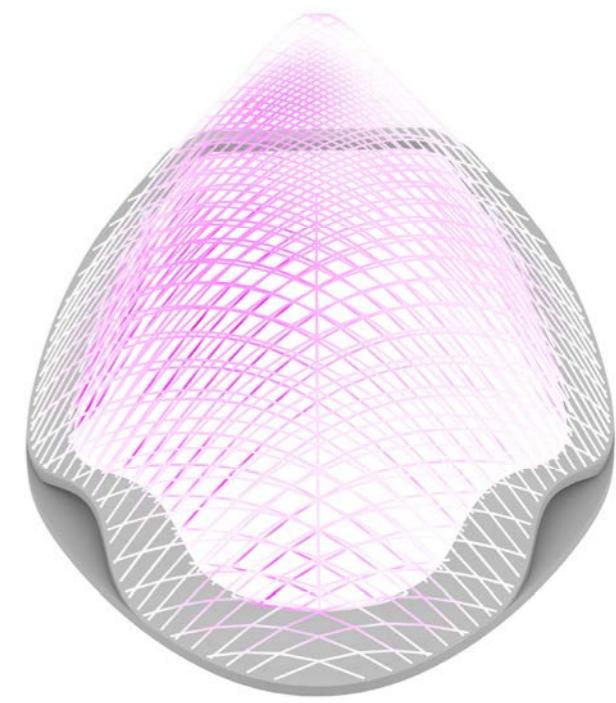
钢结构步道  
Steel Pathway

悬挂体系  
Suspensions



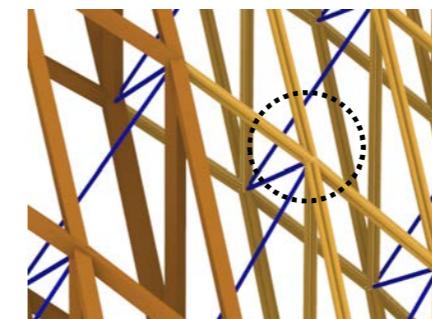
构件验算应力比

Design ratio of glubam main axes and bamboo  
bundles incl. buckling

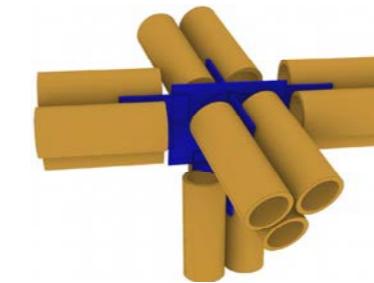


计算模型在不均匀风荷载下的结构位移

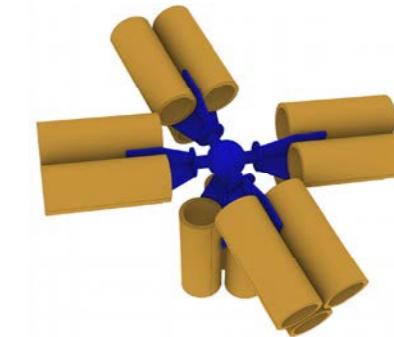
Displacement under asymmetric wind impact



竹束连接节点  
Bamboo bundle connection options



带有固定侧法兰的顶板  
Top plate with fixed side flanges



网架连接节点  
Pan knot space truss

# RØMØ

## Havneby, Denmark

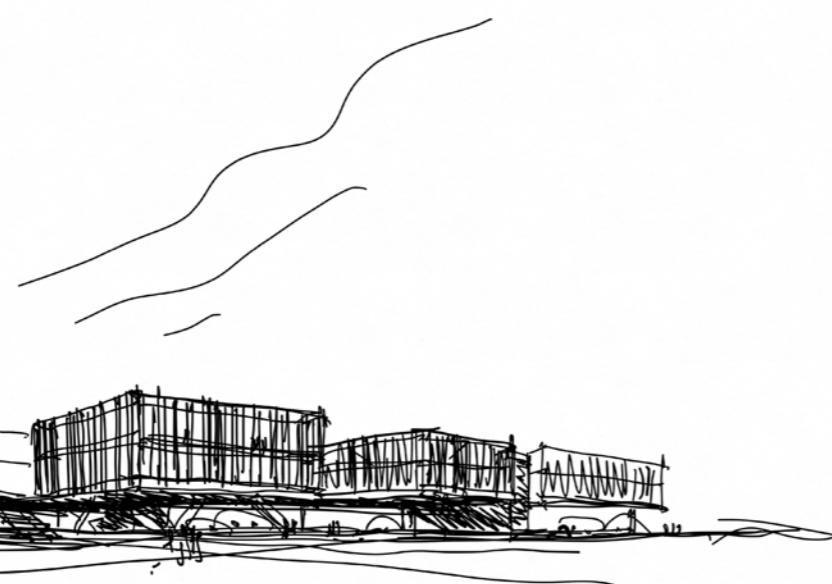


# RØMØ

## Havneby, Denmark

The island of Rømø is located in the heart of the Wattenmeer National Park, just off the North Sea Coast. The National Park is not only Denmark's largest but also a UNESCO World Heritage Site and it enjoys a natural habitat of exceptional quality. This is only one of the reasons why the holiday island is such a successful tourist attraction: In addition to its unique natural landscape, it also has much to offer in the historical, cultural and economic fields.

In order to develop the island's potential the municipality of Tønder has a local development plan, which seeks to strengthen the links between nature and tourism and to create jobs by developing the connection with the port via both commercial and tourist uses. The architectural concept is based on this study as well as being strongly inspired by the unique landscape.



The design also reacts with great sensitivity to the surrounding buildings. These existing small-scale, raised structures are built from concrete and black timber. This typology was incorporated and further developed in the new development. The ground floors of these new buildings are also raised in order to offer the necessary flood protection. This approach also ensures that, rather than hiding the unique landscape under concrete, it is left almost untouched due to the use of point foundations. The result is an efficient interaction between the buildings and the natural landscape, which is simply allowed to flow on below them.

CATEGORY  
Residential  
Hotel & SPA  
Greenhouse  
ADDRESS  
Hollænderstrædet  
6792 Havneby  
Rømø  
START OF PLANNING  
2020  
GROSS FLOOR AREA  
12.200 m<sup>2</sup>  
SITE AREA  
17.900 m<sup>2</sup>  
HEIGHT  
10,5 m  
NUMBER OF LEVELS  
3  
VISUALIZATION  
Toni Nachev



The layout of the project envisages the flexible combination of residential modules, whose size enables them to be adapted to a range of requirements. In addition to units for hotel use, there are also residential modules for the offshore workers, who work all-year-round

in the wind parks of the North Sea. These units can also be used as holiday homes or combined to create larger apartments. The proposed realisation as prefabricated modules is easy to implement and the construction period on site can be significantly reduced.



## A holistic hotel, residential and holiday complex that is in harmony with nature

The residential modules are arranged in a row to create single building complexes and are linked by a concrete block that contains the circulation core. The façade of these modules consists of a rhythmic sequence of transparent glass windows and opaque black timber that continues right around the building. The balconies and loggias that advance from this façade also extend back into the building as far as the circulation core. This enables the stairs to be naturally lit.

Despite a wide range of use requirements – hotel with visitor glasshouse and restaurant, holiday homes and apartments for offshore workers – the development retains its sense of scale: The volumes are staggered and arranged in such a way that generous external spaces are created. A holistic hotel, residential and holiday complex that is in harmony with nature.





# H.O.M.E House

## 2021





CATEGORY  
Residential  
Interior Design  
Landscape Design

CLIENT  
H.O.M.E. Magazine

GROSS FLOOR AREA  
198,14 m<sup>2</sup>

GROSS FLOOR AREA  
outdoor / landscape  
303,40 m<sup>2</sup>

CONSTRUCTION VOLUME  
1909,10 m<sup>3</sup>

LANDSCAPE VOLUME  
733,40 m<sup>3</sup>

HEIGHT  
7,50 m

NUMBER OF LEVELS  
2

NUMBER OF BASEMENTS  
1

LANDSCAPE ARCHITECTS  
ManMadeLand

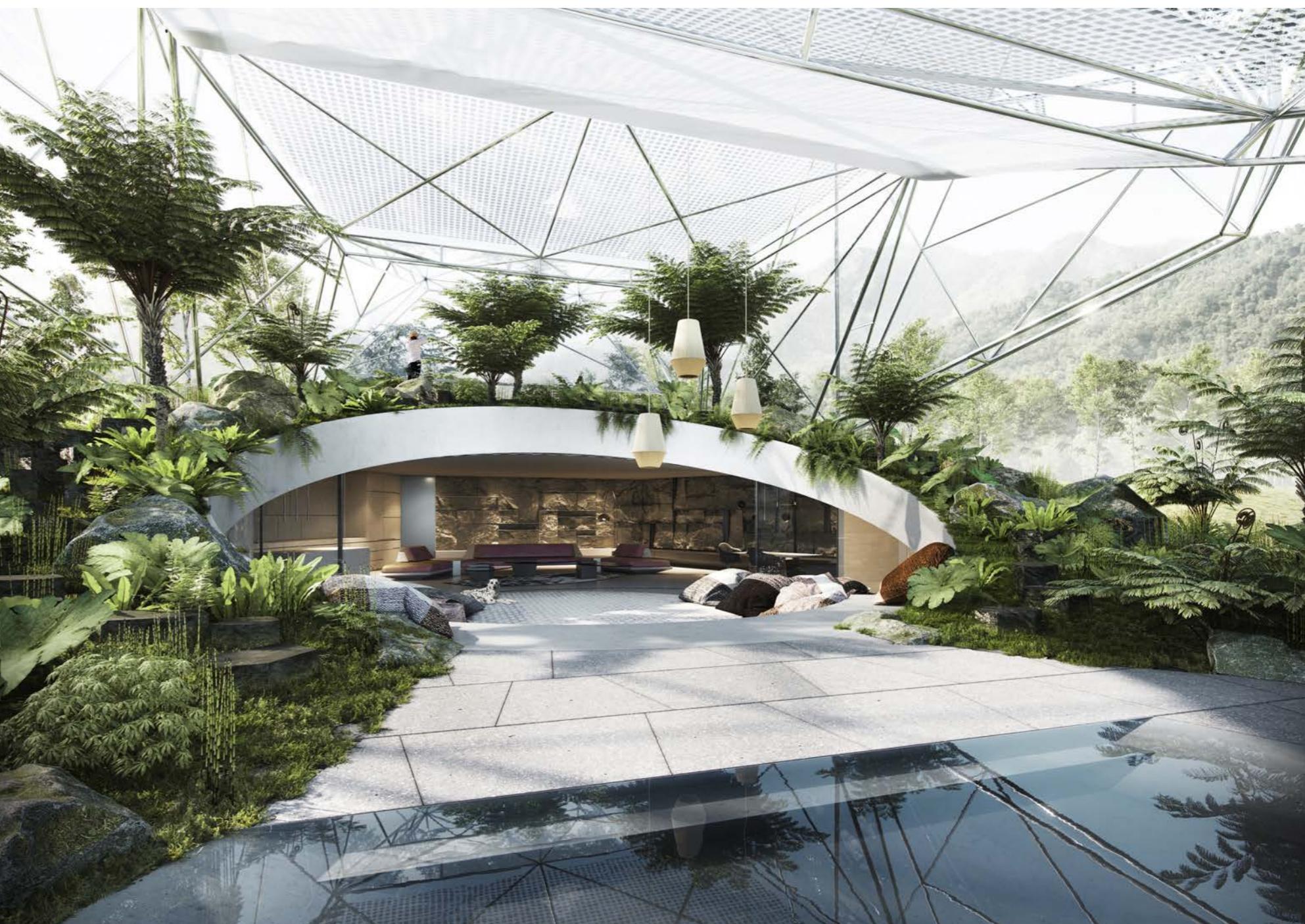
STRUCTURAL ENGINEERING  
B+G Ingenieure  
Bollinger und Grohmann ZT GmbH

BUILDING PHYSICS  
Transsolar  
Energiotechnik GmbH

VISUALIZATION  
Toni Nachev

# H.O.M.E House 2021

DMAA used the invitation to develop the so-called H.O.M.E. House 2021 as an opportunity to investigate a series of subjects that have come to the fore in recent years at the scale of the detached home. Against this background, the concept also addresses the question of whether and in which form this type of building is still appropriate today. From the starting point of an architectural-historical examination of the subject, an initial glance at the design reveals that the interface between nature and architecture has become a central motif of the project and that this has impacted upon the spatial composition in a number of ways.





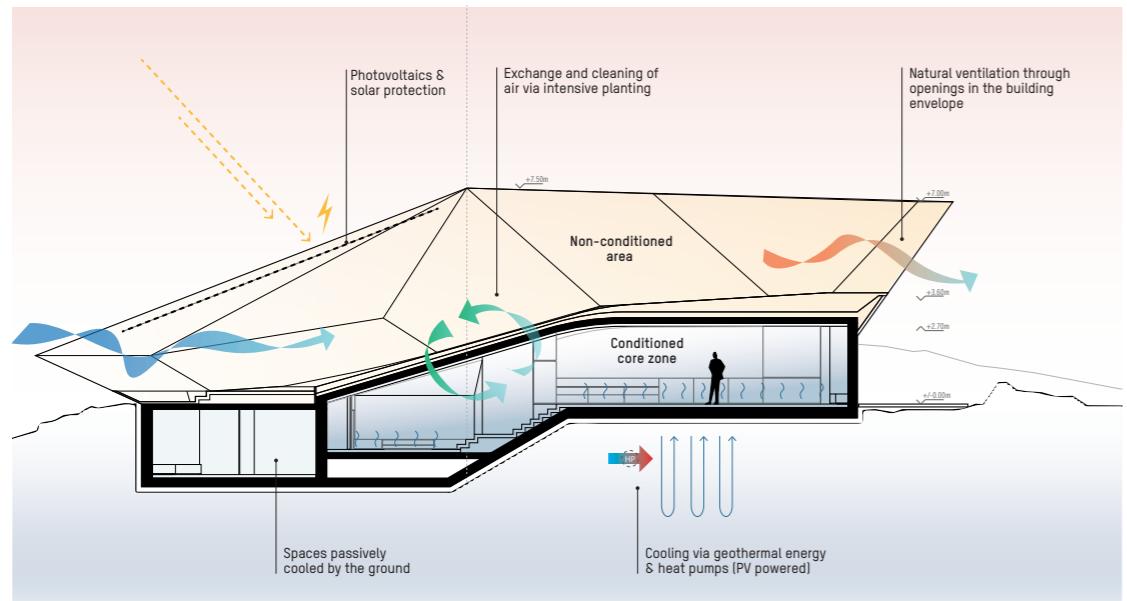
The house sees itself as an organic component of the surrounding landscape, which is reflected in the interior and 'roots' the prototype in its locality. In contrast with the functional approach of the traditional winter garden, the domesticated nature below the expanded climatic envelope of the house is directly connected with the massive, covered part of the living space and can be used all year round without any extra heating or cooling. The solution, which is based on the historical example of the farmhouse, combines low overall energy demand with user-oriented temperatures and a natural spatial climate.

The approach to the house, which is cut into the landscape, shapes the pedestrian access and leads visitors straight into the central living area, from where stairs lead to lower-lying bedroom, bathroom and ancillary spaces. This central living space opens generously onto an intermediate area within the transparent membrane roof construction, which sits upon a massive and topographically differentiated base and contains a pool, a further

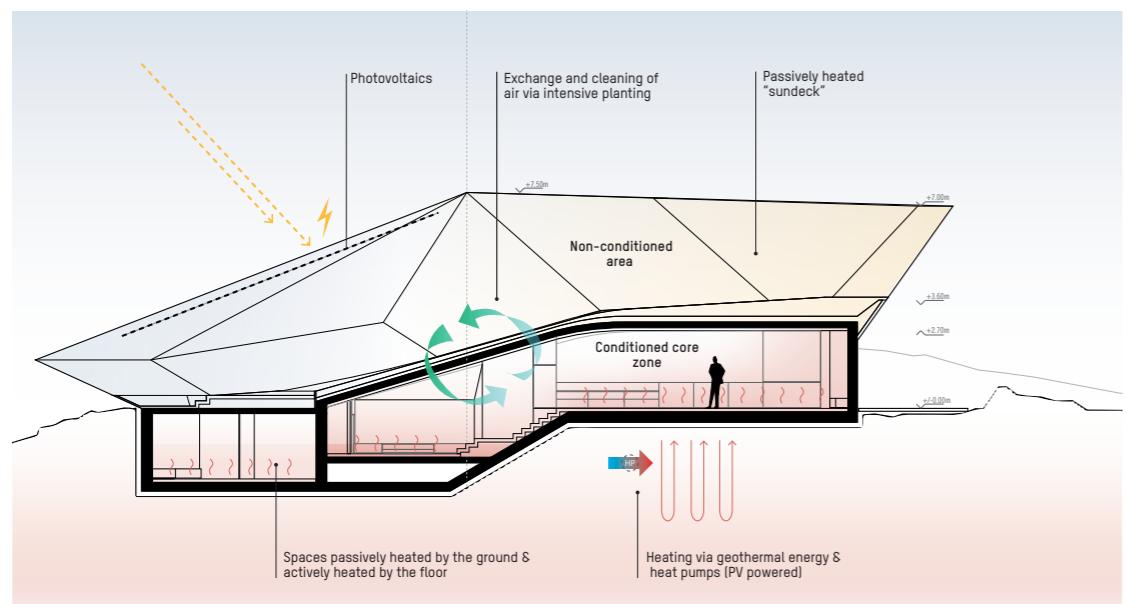
bedroom and bathroom area, and living spaces. These zones can be accessed via two stairs that form part of the house's own natural landscape. The boundary between inside and out, which, throughout the history of architecture, has often played a clear and orchestrated role, becomes the hybrid zone of a flexibly usable environment, in which furniture, space and nature merge together in line with a broader understanding of the interior and contribute to a highly dynamic, complex residential atmosphere.

The principle that underpins the design seeks to optimally reinforce the spatial relationships and those between "house and garden". This principle can also be transferred to other projects such as subsidised housing and is a good example of the way in which architecture can offer more than a mere preoccupation with space and form. The relationship between nature and architecture is currently being renegotiated. Our house makes a concrete contribution to this process.

Climate concept Summer



Climate concept Winter





# Residential Greenhouse

## Bremen, Germany



# Residential Greenhouse

## Bremen, Germany

The former Kellogg's site on the Überseeinsel in Bremen is currently being transformed into a completely new urban district. New quarters based on a combination of working, living, learning, leisure and green space are being created on the banks of the Weser.

The Neu-Stephani quarter is not only notable for its waterfront location, but will also be home to a range of residential typologies and companies with educational facilities as well as various open spaces. It is also the site of a very special housing project with a sophisticated energy concept: a residential greenhouse.

The building is divided into three principal components: a timber residential block, the superimposed greenhouse and the connecting access pergola.

The residential building is executed as a fully prefabricated, modular timber structure that is merely assembled on site. The residential units include standard modules of around  $42\text{m}^2$  (2 rooms) and  $54\text{ m}^2$  (3 rooms), studio apartments measuring  $30\text{m}^2$  and optimized family apartments with  $85\text{ m}^2$  (3 rooms plus office area). Depending upon how the modules are combined, the building can contain between 30 and 54 residential units.

CATEGORY  
Residential  
Greenhouse  
ADDRESS  
Quartier Neu-Stephani  
Überseeinsel  
28217 Bremen  
START OF PLANNING  
2020  
GROSS SURFACE AREA  
 $5.065\text{m}^2$   
GROSS SURFACE AREA  
ABOVE GROUND  
 $4.452\text{ m}^2$   
HEIGHT  
27,5 m  
NUMBER OF LEVELS  
Souterrain + 7  
VISUALIZATION  
Toni Nachev



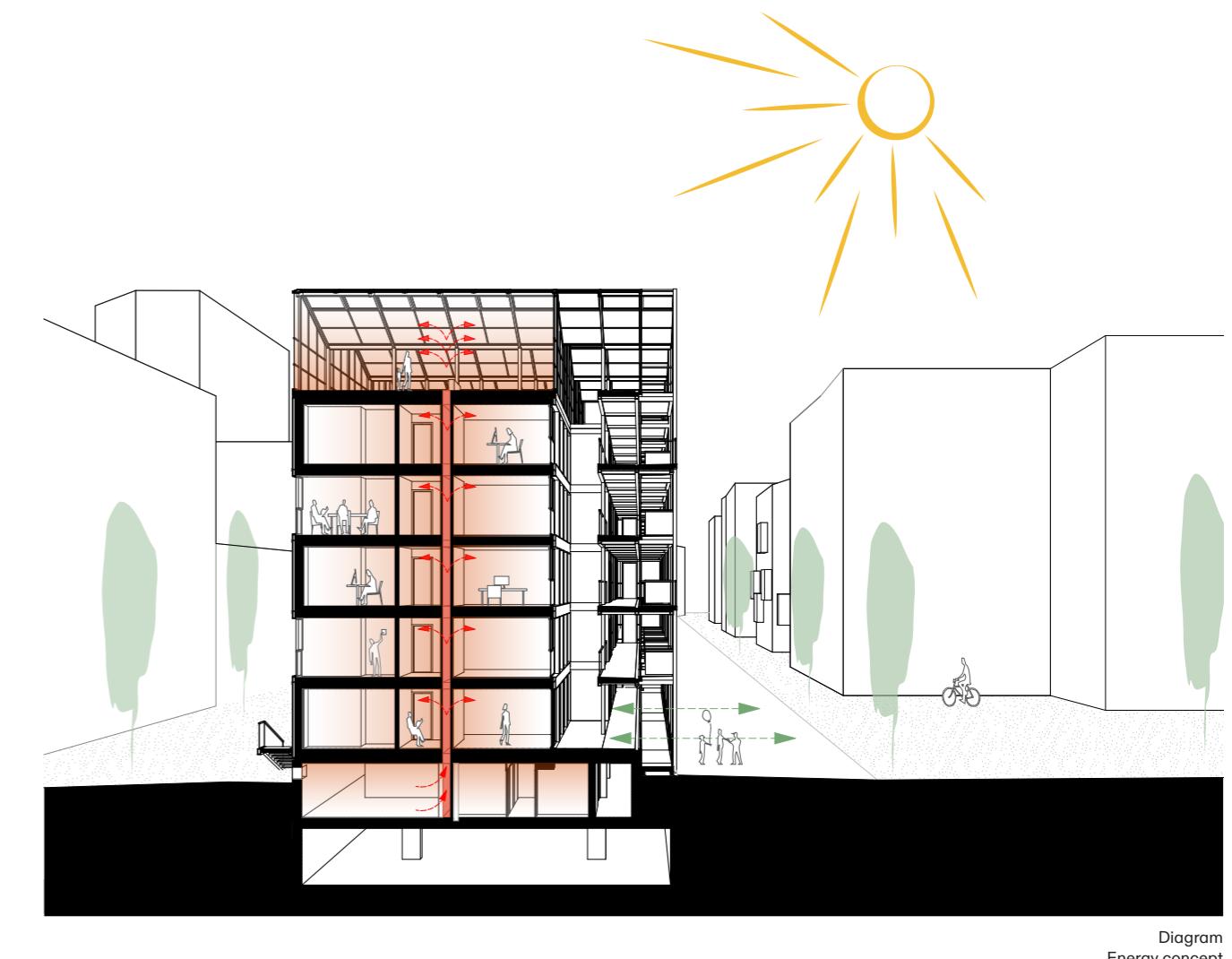


Diagram  
Energy concept





# Greenhouse Ganzhou

## Ganzhou, China

# Greenhouse Ganzhou

## Ganzhou, China

**CATEGORY**  
Greenhouse, Cultural, Exhibition,  
Landscape Design

**ADDRESS**  
Ganzhou  
China

**STUDY**  
02/2019

**GROSS FLOOR AREA**  
5.451 m<sup>2</sup>

**SITE AREA**  
32.414 m<sup>2</sup>

**BUILT-UP AREA**  
38.530 m<sup>3</sup>

**HEIGHT**  
27 m

**NUMBER OF LEVELS**  
2-3

**NUMBER OF BASEMENTS**  
1

**VISUALIZATION**  
Toni Nachev

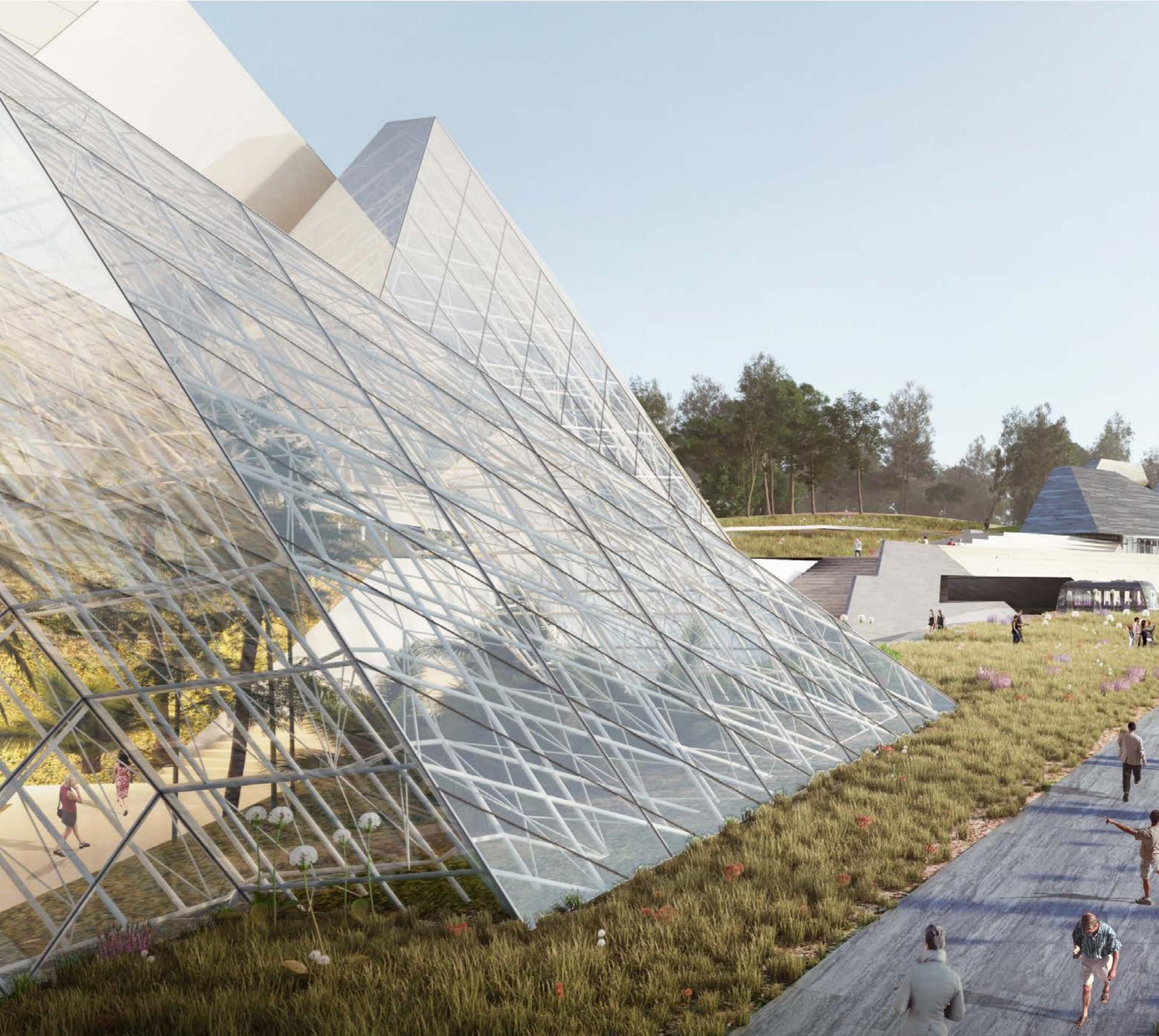
**CONSULTANTS**  
Coordination  
Yiju Ding

Structural engineering  
Bollinger+Grohmann

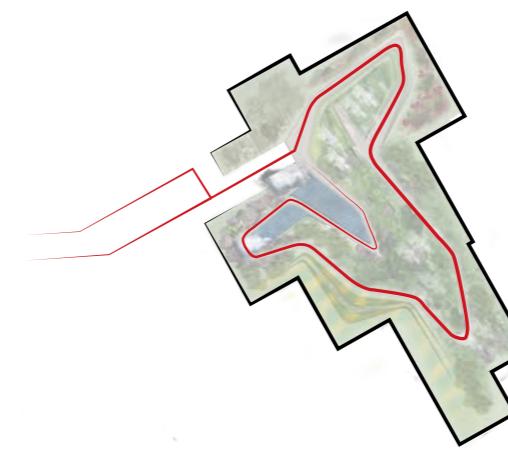
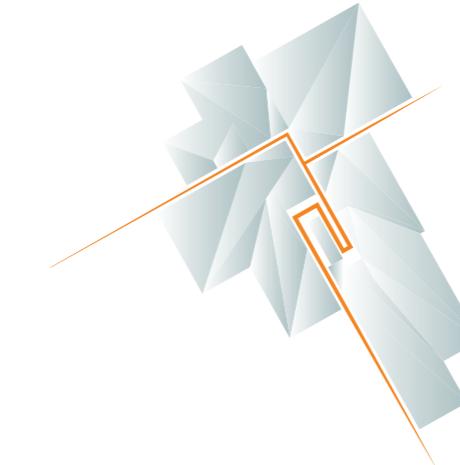
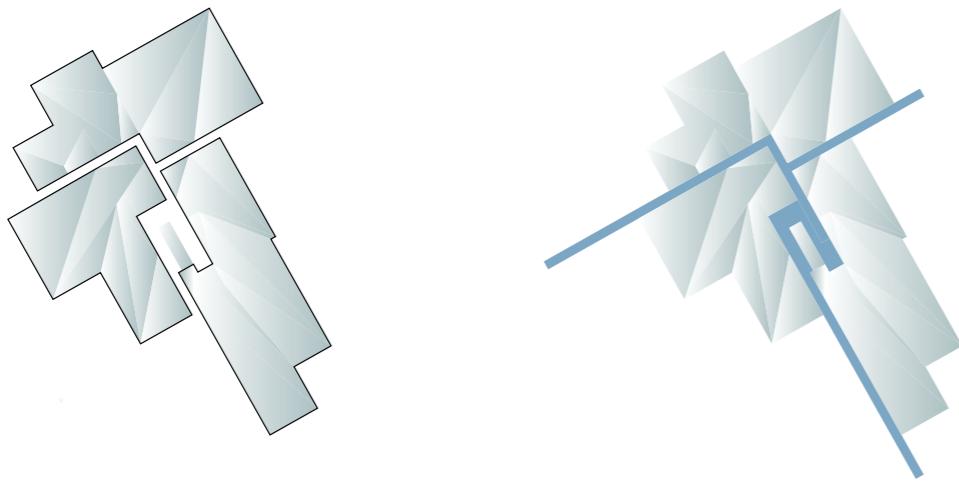
The meaning and concept of the crystal shape of the greenhouse is threefold: Firstly, like a crystal nature is precious and thus needs to be protected. Secondly, being shaped like a crystal the greenhouse refracts and reflects the light, demagnifies the view from one angle and expands it from another. Lastly, the shape of the greenhouse reproduces its surrounding landscape of Ganzhou, being a spatial interpretation of nature.

Structured in two circulation principles visitors have the chance to experience the greenhouse from inside as well as from outside. The interior path guides visitors on a wavy topography, through dense tropical forests, along a lake and a waterfall into a fantasy world. The exterior path guides visitors around the greenhouse and through the crystalline building structure. Walking through the canyons of the outside crystalline structure allows to view the exhibition in the interior from above. This public walk-through is part of an exterior path through the park and surrounding forests.

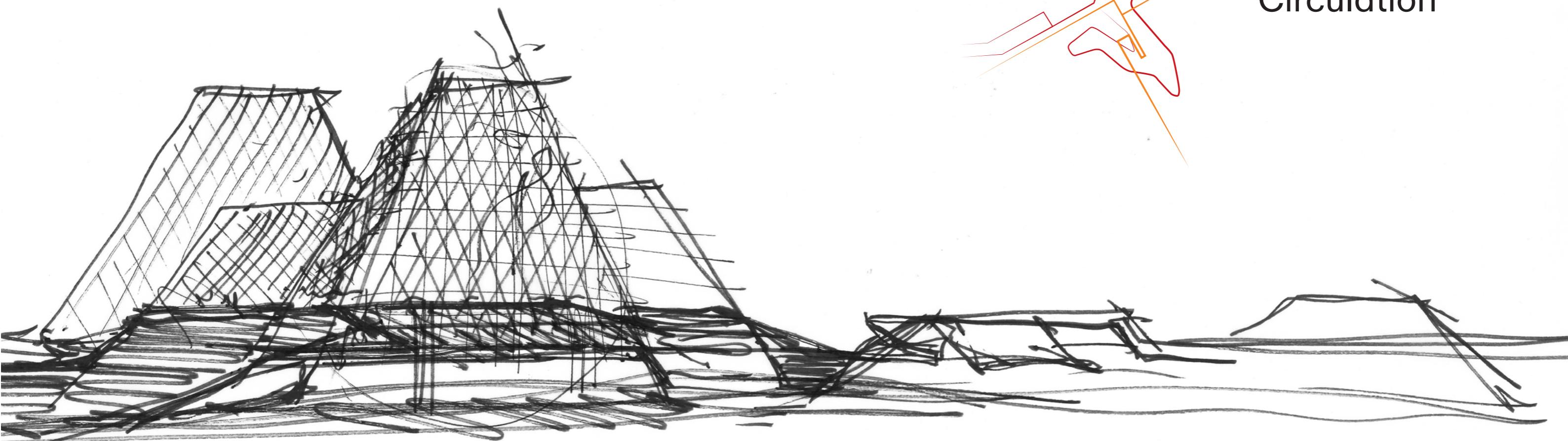
The transparent look of the greenhouse leads to a perfect visual fusion with its surrounding landscape and the preserved nature it contains. In this design nature and architecture form a unique symbiosis.

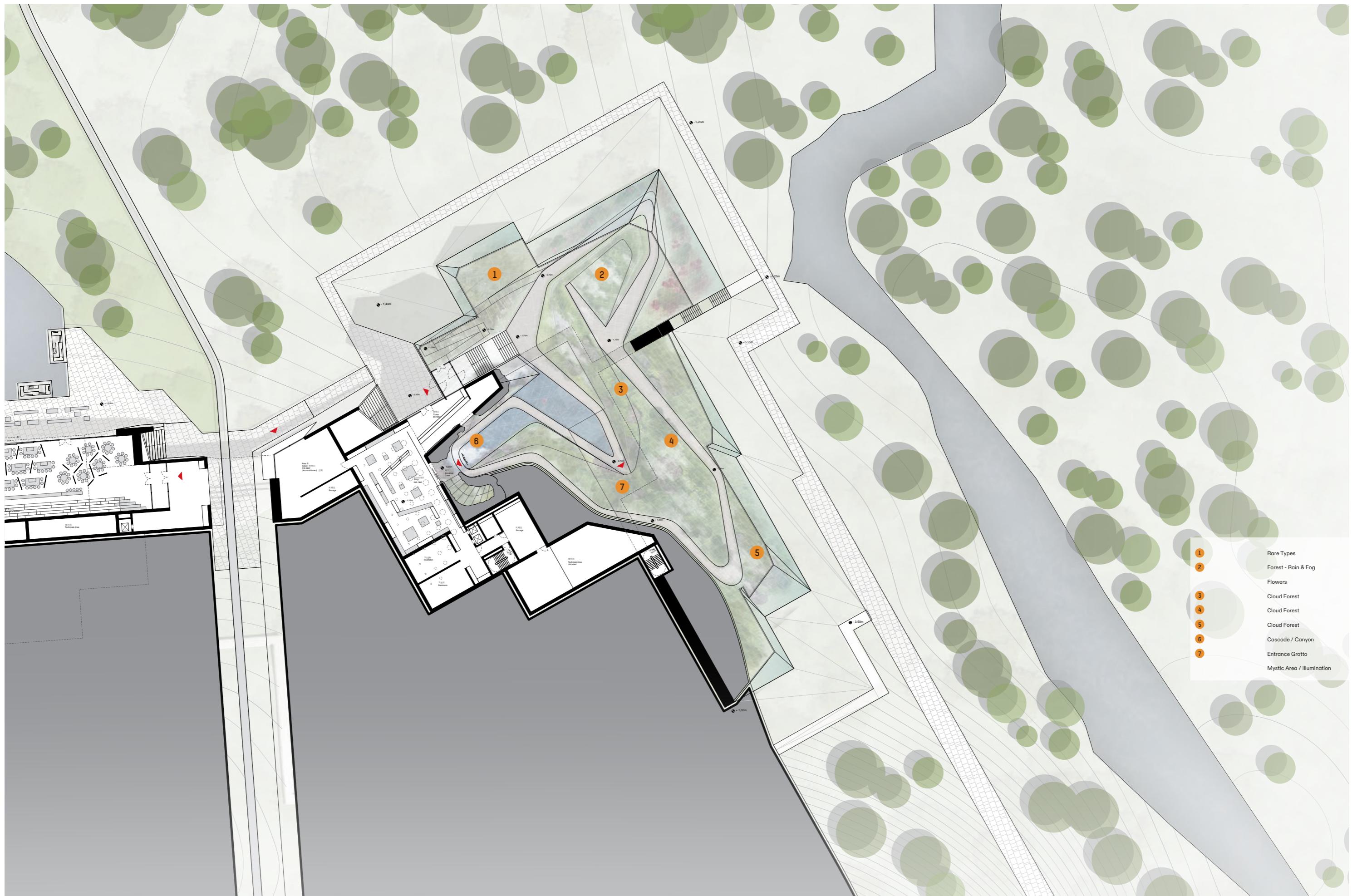


## Crystal & Canyon



## Circulation













Greenhouse Shanghai  
Shanghai, China

# Greenhouse Shanghai Shanghai, China

The project is designed to provide optimal environmental conditions for the five different greenhouse spaces, the entrance building and the public spaces, while minimizing energy needs through a combination of passive and active air conditioning strategies and the use of renewable energy.

To free the interior from any kind of construction, the structural concept envisages that a tensioned lattice structure made of thin steel tubes forms a roof with an elegant and extraordinary silhouette that supports the glass roofs of the different greenhouses, blending them into a single composition.

Bringing nature to the cities is the main objective, thus taking an important step towards promoting new synergies and a new lifestyle.

The design for the Plant Pavilions creates a lightweight natural membrane from the exterior natural landscape to the greenhouse interior providing desired heat and humidity for rare and tropical species. Inside the dome big bodies of water and rocks are used for thermal storage, waterfalls for controlling humidity, and south facing glass walls maximize solar exposure to consume as little of additional energy as possible.

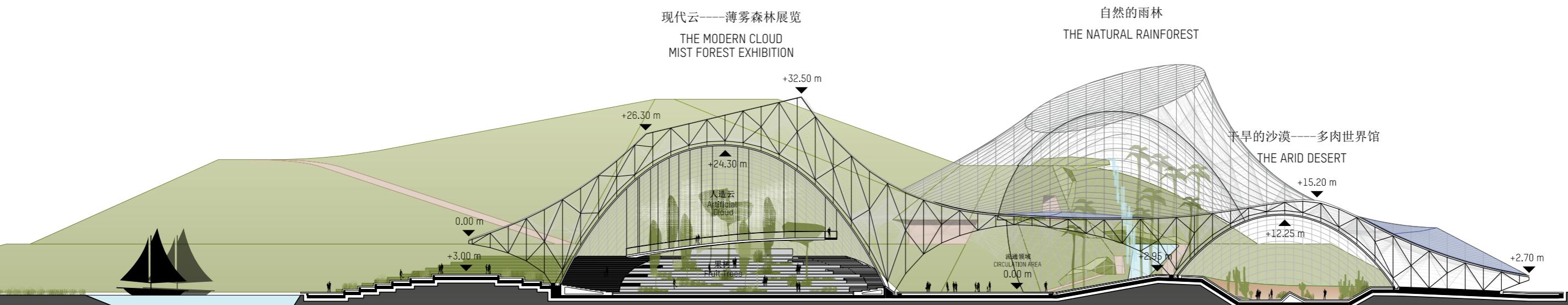
In the greenhouses, different natural scenarios and climates are recreated. Visitors can experience the canyons, sandy dunes and plants from the Desert Pavilion. The swamps, waterfalls and tropical vegetation of the Natural Rainforest exhibition or the digital caves, cascades, fruit-trees and flowers of the Cloud Garden Hall. Nature is everywhere.

CATEGORY  
Cultural  
Exhibition  
Greenhouse  
ADDRESS  
Shanghai  
China  
COMPETITION  
Phase I  
08/2018  
GROSS FLOOR AREA  
35.000 m<sup>2</sup>  
VOLUME  
162.125 m<sup>3</sup>  
CONSULTANTS  
Coordination  
Yiju Ding  
Structural Engineering  
Bolinger + Grohmann ZT  
GmbH  
Landscape Design  
Yiju Ding  
Model  
SCALA MATTA  
Modelbau Studio Vienna

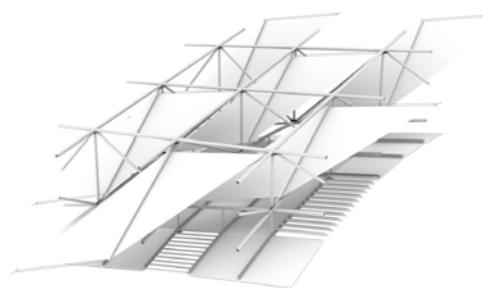
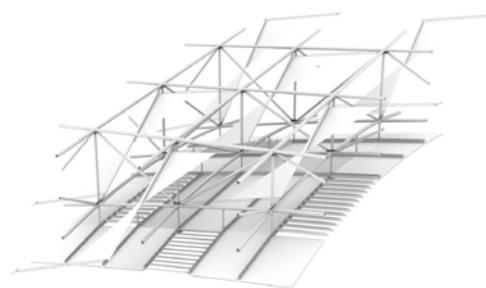
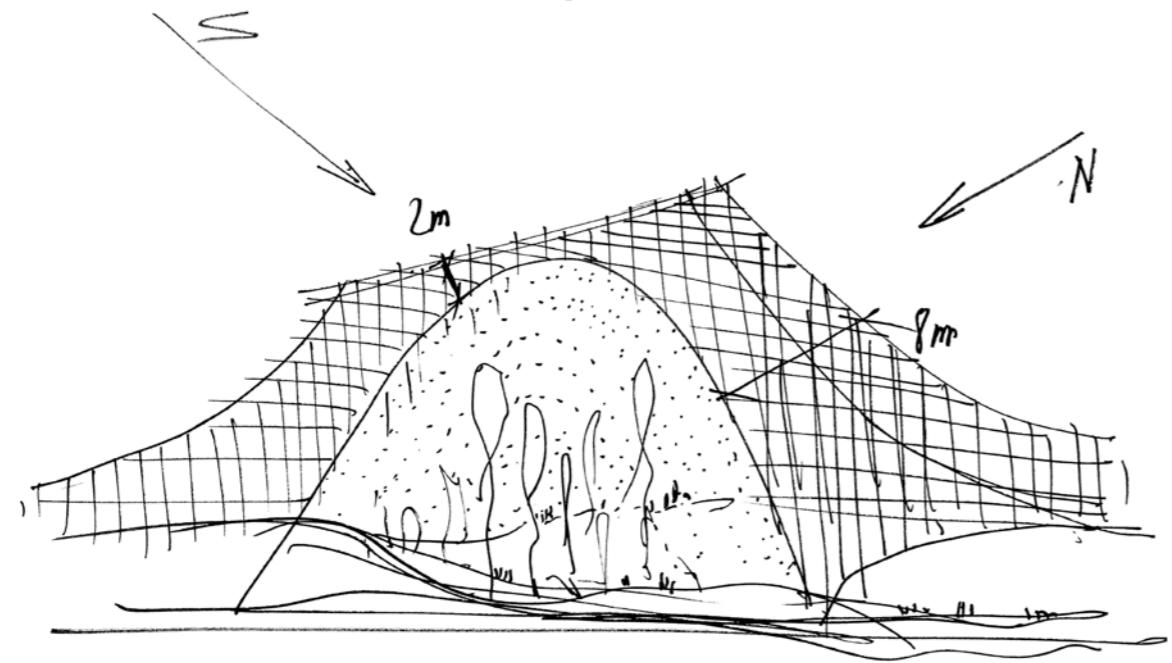




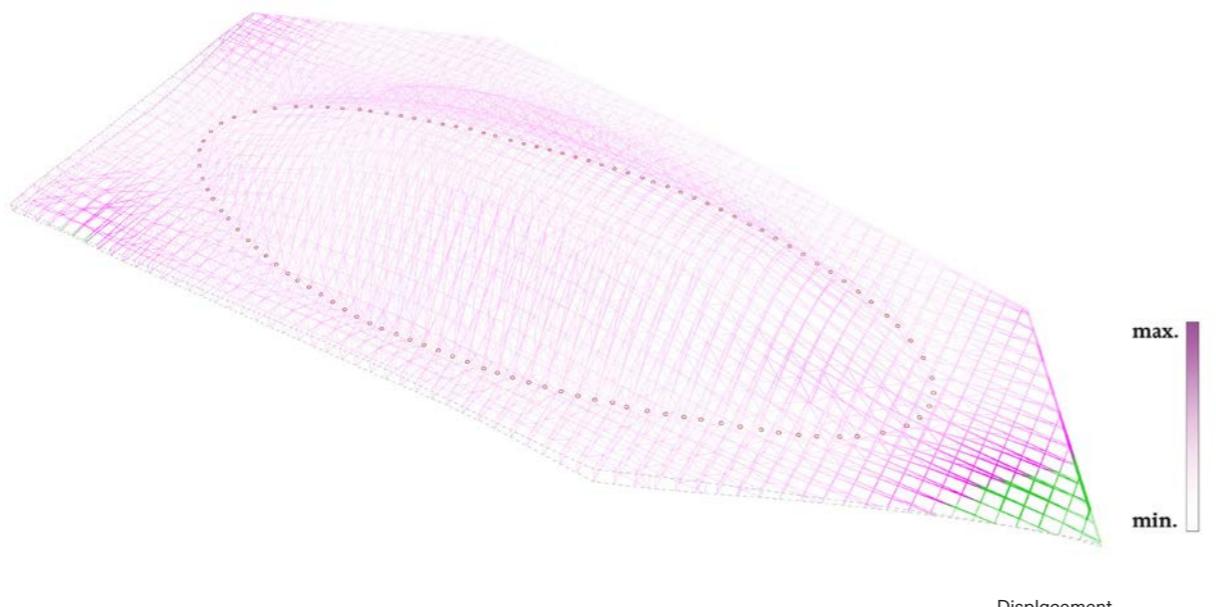
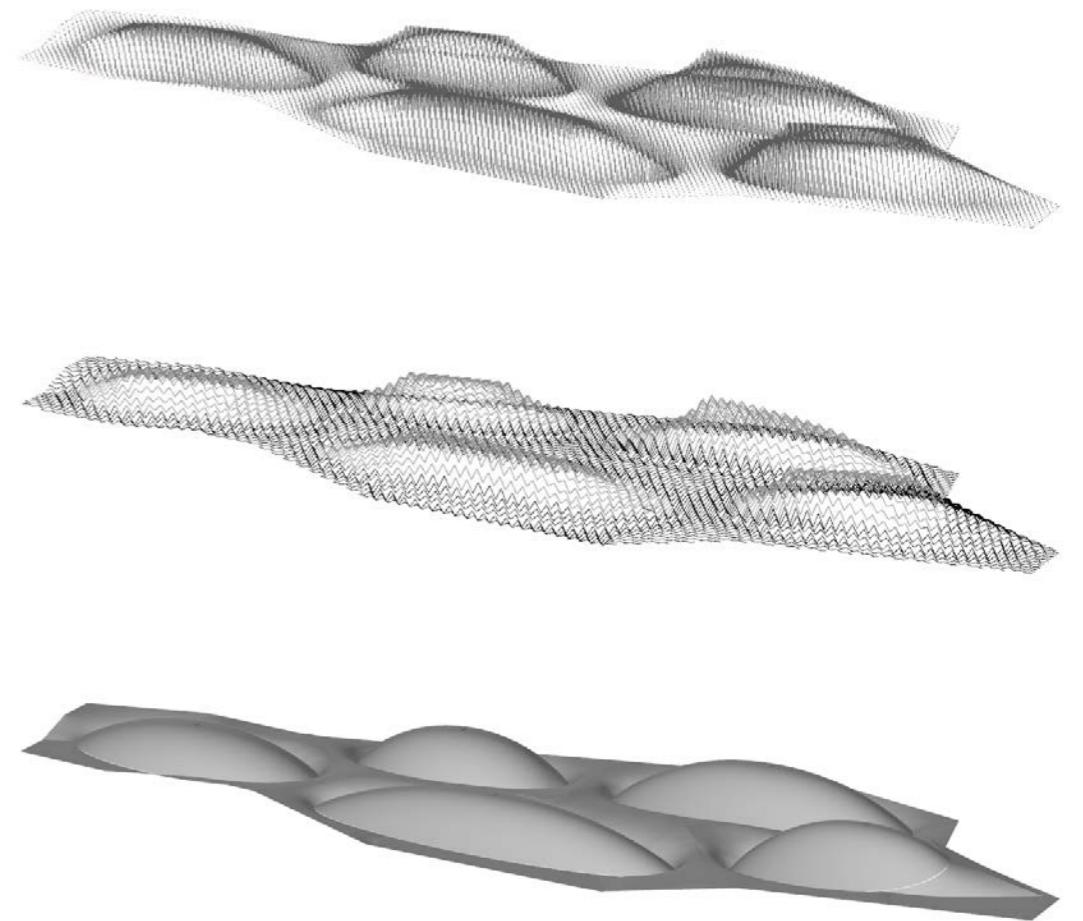




# Structure Concept

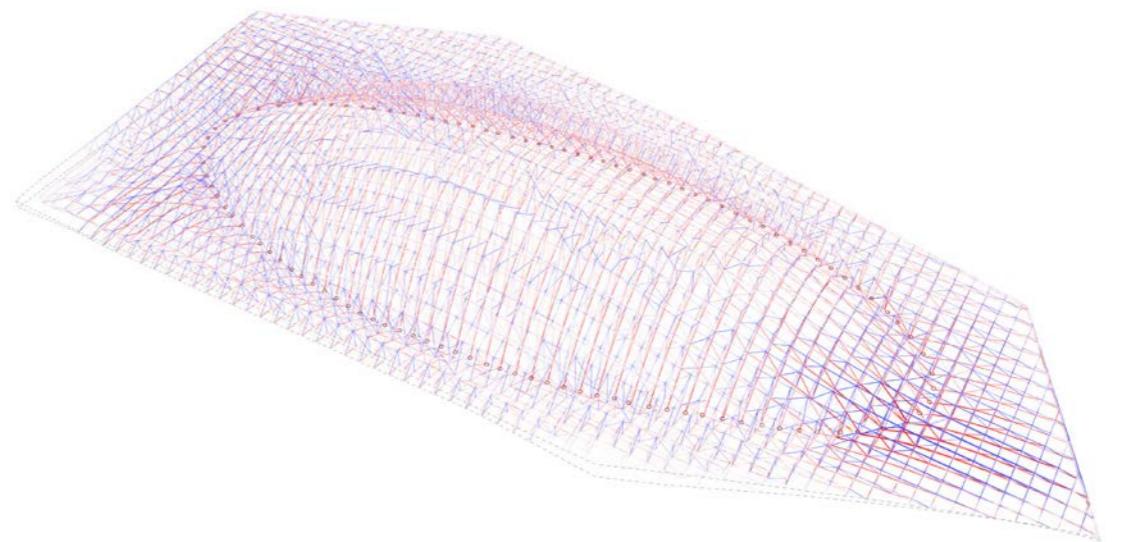


Detail showing  
closed exterior fabric shading

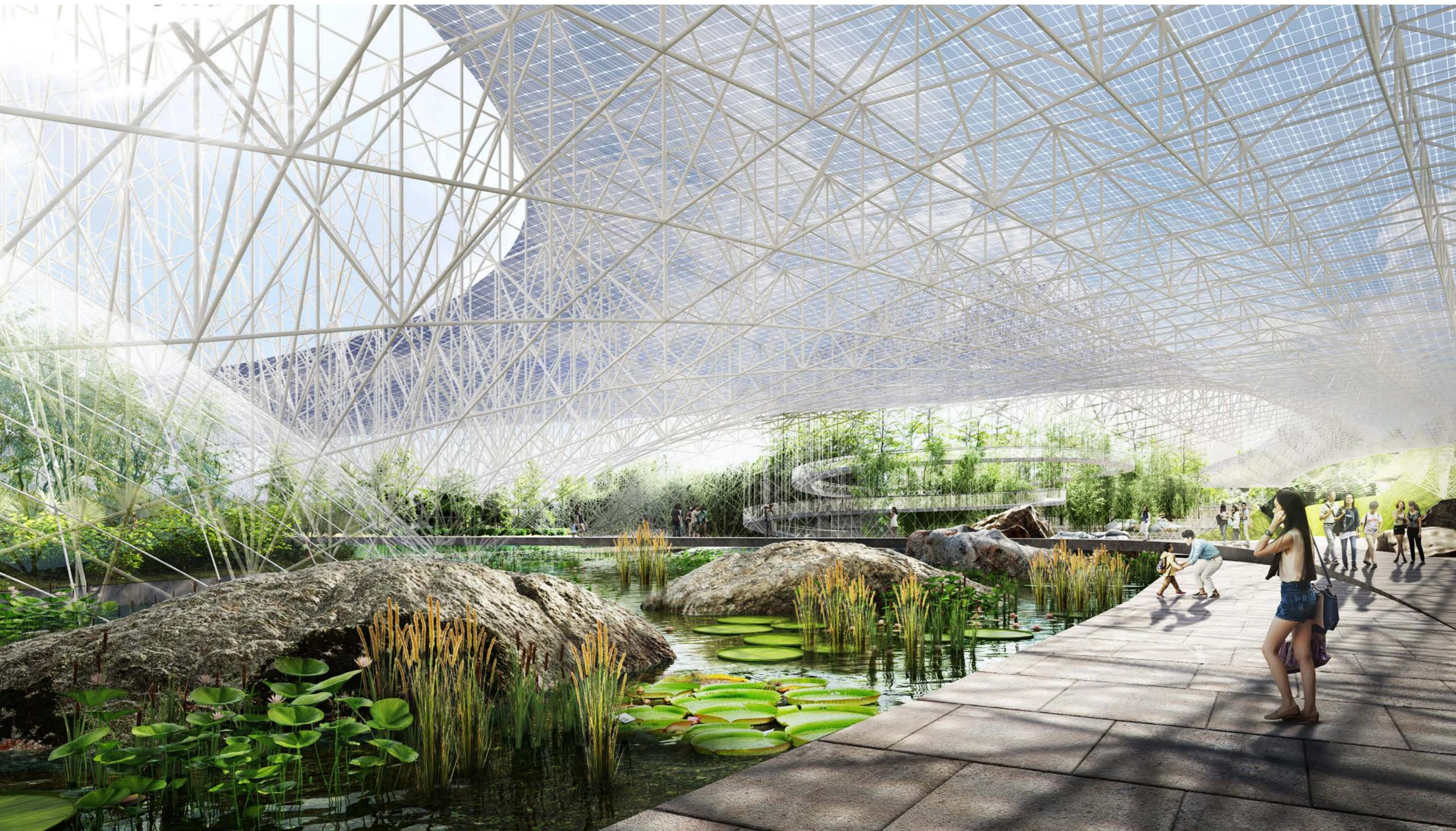


Displacement

© Bollinger + Grohmann



Overview of the structure





# Foshan Paradise Pavillion

## Foshan City, China



# Foshan Paradise Pavillion

## Foshan City, China

CATEGORY  
Cultural,  
Greenhouse, Landscape,  
Urban Development

ADDRESS  
Lecong, Foshan City,  
China

START OF PLANNING  
2018

GROSS SURFACE AREA  
29.997,07 m<sup>2</sup>

4 PAVILIONS  
14.388 m<sup>2</sup>

SITE AREA  
82.083 m<sup>2</sup>

HEIGHT  
50 m (highest peak)

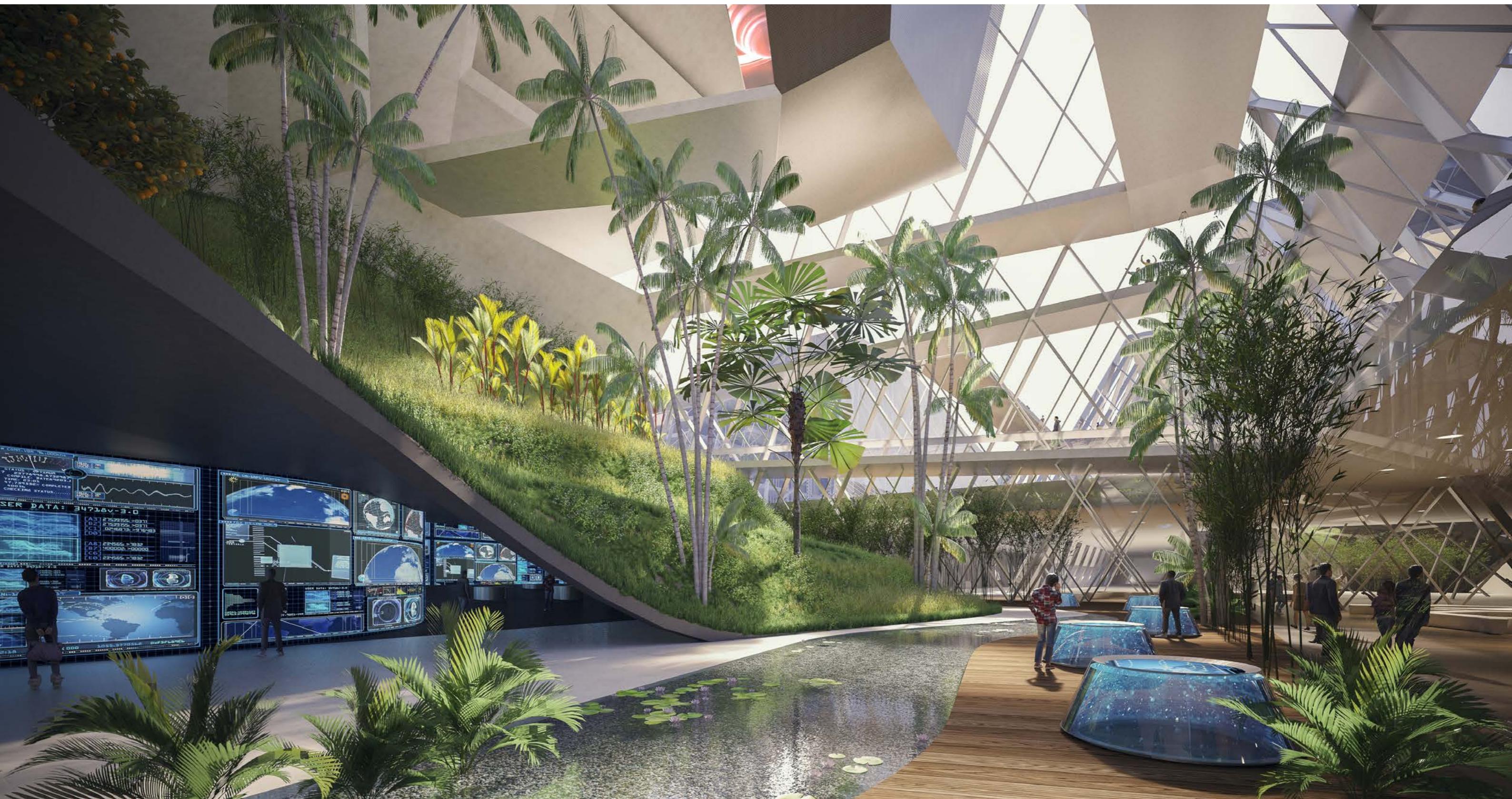
In a time where the world is facing severe threats by the climate change, planners and governments need to rethink how cities are being shaped and which impact they can have on the environment and urban health. Reducing the number of gas fueled vehicles and spreading green areas through our cities is a realistic step our society must embrace. The Foshan Paradise Mountain pursues these idealisms and pretends to envision the hills of the city's surrounding into the middle of the urban network. As a green lung, that seeks to replenish the air with oxygen, the new area intends to incorporate a series of activities and performances. Sports, adventure, culture, leisure, science, and education are combined in both indoor and outdoor facilities that together form a new type of contemporary symbol for the city: a green and natural landmark – a refreshing and exciting stage for people to interact, experience and learn in contact with nature.



The mountain's geometry is designed to provide shadow during long periods of the day, allowing for a more efficient energetic concept. Accordingly, the exterior appearance of the Foshan Paradise Mountain recreates a true natural and organic environment, where trees and vegetation grow in a controlled manner to provide shading and space for sports and leisure, at the same time as it allows people to discover the hidden and outstanding corners of the urban forest. On the other hand, the middle point of the mountain is cropped, like a sharp cut that reflects its crystalline inner body, as it provides functions inside. These are grouped into 4 main themes: Tropical Adventure, Nature and Technic, Future of Nutrition and Sensorial Hall (Flower Pavilion). The project attempts to assume environmental responsibility and a self-efficiency resource throughout its building cycle.

The earth removed from the site to create the lake, can be directly transported and used to shape the mountain, as it serves as a cooling shell that sets boundary from the external heat to the interior spaces. These are carved out from the main geometry, allowing to control and reduce the amount of sunlight that heats the rooms inside, as a reaction to the humid and tropical climate. On top of the mountain, a natural park is placed, filled with thousands of bamboos trees that boom the whole area with fresh and renewed air, as it cleans the CO<sub>2</sub> emissions. The bamboos produce normally 3 times more oxygen than other common trees.







# Greenhouse Changchun

## Changchun, China



# Greenhouse Changchun

## Changchun, China

The landscape park is located at the end of the Caiyu road developed within the urban planning concept of AS & P Architects in the south of Changchun. The greenhouse with an art gallery serves both as an entrance to the landscape park and an urban interface to the countryside.

The folded topography of the project becomes a part of the landscape, the waters of the Xinling reservoir a part of the building. This conception of a terraced landscape allows visitors a 360 ° panorama over the city, a landmark which meets diverse requirements of contextuality and function. The greenhouse is oriented towards the south, the art gallery as well as the nine studios embedded in the landscape then to the north.

CATEGORY  
Greenhouse, Museum  
ADDRESS  
Jingyue Oeko -Kulturpark,  
Changchun, China  
FLOOR AREA  
6,835.16 m<sup>2</sup>  
GROSS SURFACE AREA  
18,955 m<sup>2</sup>  
SITE AREA  
2,168,428 m<sup>2</sup>  
HEIGHT  
30 m  
NUMBER OF LEVELS  
3  
CONSULTANTS  
LANDSCAPE  
Burger + Kühn  
Landschaftsarchitekten





# Beijing Vertical Farming

## Beijing, China



# Beijing Vertical Farming

## Beijing, China





Fürstenwald  
Austria



# Fürstenwald

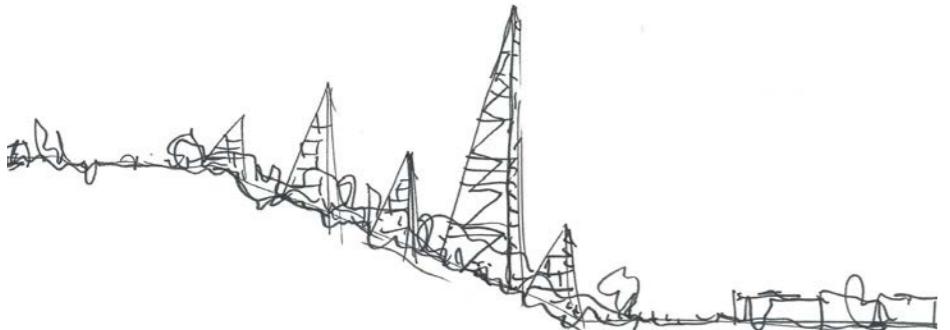
## Austria

The final example is also still under development but it offers the clearest demonstration of the ecological paradigm change that is currently taking place. DMAA was invited to develop a concept for the reuse of the site of a former brickworks, which is adjacent to an area of woodland not far from the centre of Fürstenfeld.

The spatial programme envisages a range of uses related to the subject of “The Agriculture of the Future”. The elements that are to be developed include demonstration glasshouses, a market place, a congress centre and a training facility for the next generation of agricultural and forestry experts.

However, alongside the concrete formal articulation of the individual volumes, the project also focusses on an urban planning approach that can be described as ‘the green urban district’.

DMAA has chosen to reject the classic “European grid”, in favour of the decentralised organisation of the buildings in clusters, combined with a largely car-free mobility concept, in which nature becomes the central, communicating motif of the built intervention. The quality and scale of this new green space justifies the concentrated, high-rise development of a vertical farming facility, which is energy-autarkic due to the use of solar and wind energy and extracts the humidity required for watering the crops from the air.



# Afforestation Area for Research, Food Production and Recreation Development





Show case tower  
for vertical farming



# Office Profil



Delugan Meissl Associated Architects (DMAA) is an international architecture office based in Vienna, Austria. DMAA addresses the social and ecological issues of today, in defiance of routine responses and with a passionate and relentless focus on the new and the unconventional. Our vision: We create spaces that meet the individual, social and cultural needs of people in their regional context. With our passion and our love for experimentation, combined with our complete professionalism, we have spent many years developing surprising and versatile high-quality architectural solutions. These are

exemplified by flagship projects as the EYE Filmmuseum in Amsterdam, the Porsche Museum in Stuttgart and the Festspielhaus Erl.

DMAA was founded in 1993 by Elke Delugan-Meissl and Roman Delugan. They have run the office together with Dietmar Feistel and Martin Josst since 2004. DMAA is an international team of over 40 architects, 3D engineers and other creatives.

Our latest projects are being realised in Europe, China, the Arab World and the US.

From the very beginning DMAA has focussed on how the investigation of requirements impacts upon the form of a building, our approach to technological development and what architecture can contribute to society.

## Experience

Each person's experience of a place is highly individual. But these experiences are not independent of the space. Rather, they emerge reciprocally, like a pas de deux.

We intensify the spatial experience by carefully orchestrating the relationship

between routes, thresholds and spaces. These contain a range of experiential qualities that lend a place for atmosphere and character. They speed up or slow down movement, determine whether transitions between external and internal spaces flow or are marked by rigid contrasts, make us aware of such sensory spatial characteristics as narrowness and breadth.

## APPROACH

**Our modus operandi is based on four coordinates: Experience, Information, Technology and Society.**

We understand a building as an active partner that can contribute as much to the physical experience of the individual as to social interaction and the emergence of the collective.

## Information

Our architectural work begins with obvious questions: What are the requirements of a place? What is the current situation, what is its history, what should be possible there? In short, what does a place need in order to enhance the life of every participant? These and many other questions flow together into our project work. And in order to be able to answer them, we discuss openly within our team as well as with our clients and future users, our partners and external experts.



Clockwise from top left:  
Elke Delugan-Meissl  
(Founder), Roman  
Delugan (Founder), Dietmar  
Feistel (Partner), Martin  
Josst (Partner)

For updates and details  
on our current team,  
awards and publications  
please visit our website  
at [www.dmaa.at](http://www.dmaa.at) or follow  
us on Instagram.

The knowledge generated by this joint research shapes the design and develops it into a compact, forward-looking statement and the starting point for new questions.

#### Technology

Our own work is dependent upon the state of technological development of software and materials, of machinery and production methods, of building services and logistics, to name just some of the many technical aspects of the construction process.

The experience gained from every completed project opens up new horizons. That which recently seemed impossible is suddenly within our reach. We search for these challenges, shift boundaries of what is possible and energetically research together with our partners in order to discover new potential.

This is an approach in which technology and creativity go hand in hand. They interact productively. The appearance of a building is also always the reflection of a form that functions and that meets concrete needs in terms of experience, meaning and use.

## ABOUT

**Based in Vienna, founded 1993.  
Employing 40-50 architects  
and designers.  
More than 100 projects  
realised worldwide.**

## VALUES

**Places for people.  
Engaging, empowering.**

#### Society

DMAA always addresses space in conjunction with people and with the world as it is today and how we would like it to be for our children. Our notion of space is very broad, it unites a wide range of perspectives (social, cultural, political, economical, functional, historical, aesthetical, etc.) into a concrete form. It is open for change and new ideas, it is never restricted by ideology.

Architecture creates the spatial preconditions for individual, physical experiences as well as for social interactions, generates high-quality atmospheres and surroundings, organises and structures our social life. Architecture is indispensable to society. How do we want to dwell, work, experience culture and live together in the future? The objective of our work is to generate spaces that provide sustainable answers to these questions.

CV	2003-2008	2007 – 2008	Grand Austrian State Prize, Elke Delugan-Meissl, Roman Delugan, 2015	2004 „Offices“ [2nd price], 2004
1993 Delugan-Meissl ZT GmbH was founded jointly by Elke Delugan-Meissl and Roman Delugan	Member of the Land Advisory Board Vienna	Teaching position at the Vienna University of Technology Guest critic at the Vienna University of Technology	Festival Hall Erl, Nominated for the Mies van der Rohe Price, 2015	House Ray1, Polydecor-Corian Design Award [1st price], 2004
2004 Expansion to Delugan Meissl Associated Architects PARTNER: Dietmar Feistel, Martin Josst	2006 Prize of the City of Vienna for Architecture	Martin Josst born in Hamburg, Germany Studied at Muthesius Academy of Art and Design Kiel Practice at Studio Morphosis, Los Angeles	Silver Medal of the City of Vienna, Elke Delugan-Meissl, Roman Delugan, 2015 Tendo, iF Design Award, 2015	House Ray1, Deutscher Um-baupreis [1st price], 2004 House Ray1, Nominated for the Mies van der Rohe Award, 2003
2012 Establishment of the brand DMID, Delugan Meissl Industrial Design	2006-2010 Chairwoman of the Building and Urban Design Assessment Committee Salzburg	since 2001 Practice at Delugan Meissl ZT GmbH	Festival Hall Erl, Auszeichnung des Landes Tirol für Neues Bauen, 2014	Townhouse Wimbergergasse, Bauherrenpreis, 2002
Roman Delugan	2009-2011 Chairwoman of the BIG Architecture Advisory Board Vienna	since 2004 Partner at Delugan Meissl Associated Architects	Festival Hall Erl, AIT-Award, 2nd Prize in Category „Public Buildings / Education“, 2014	Townhouse Wimbergergasse, Building contractor Award, 2002
born in Merano, Italy Studied at the University of Applied Arts, Vienna [masterclass of Professor Wilhelm Holzbauer]	2010-2011 Teaching position at the University of Applied Arts, Vienna	2006-2007 Teaching position at the University of Stuttgart	Eye Film Institute Netherlands, Nominated for the Mies van der Rohe Price, 2013	Publications (Selection)
1984-1985 Research project «Architecture of the 20th century in Austria», directed by Professor Friedrich Achleitner	2014-2016 Member of the Architectural Advisory Board Regensburg	2010-2011 Teaching position at the University of Applied Arts, Vienna	IYON LED spotlight range, Design Plus Award, 2013	NON ENDLESS SPACE, published Birkhäuser – Publishing for Architecture, Basel, 2023, ISBN 978-3-0356-2591-2
1996-1997 Teaching position at the University of Applied Arts, Vienna	2015 Grand Austrian State Prize	2015 Silver Medal of the City of Vienna	IYON LED spotlight range, Nominated for the Bundespreis ecodesign, 2012	360°, published by Delugan Meissl Associated Architects, Vienna, 2018, Order: communication@dmaa.at
2004-2005 Guest lecturer and guest critic at the BFH Berner Fachhochschule	since 2016 Member of the Austrian Art Senate	Awards (Selection)	IYON LED spotlight range, Design Plus Award, 2012	ZOOM, published by Delugan Meissl Associated Architects, Vienna, 2018, Order: communication@dmaa.at
2006 Prize of the City of Vienna for Architecture	since 2017 Member of the Advisory Board for Urban Planning and Urban Design Vienna	Taiyuan Botanical Garden Domes, Structural Awards 2021 Winner, The Institution of Structural Engineers, 2021	IYON LED spotlight range, reddot design award, 2012	PLACES FOR PEOPLE, published by Elke Delugan-Meissl, Commissioner of the Austrian Pavilion, Sabine Dreher and Christian Muhr / Liquid Frontiers, Co-Curators, Vienna, 2016
2007-2009 Guest lecturer and guest critic at the MSA Münster School of Architecture	since 2018 President of the Austrian Frederick and Lillian Kiesler Private Foundation	Taiyuan Botanical Garden, Gold Medal for outstanding design, 2021	Brauerei Liesing, ECOLA-Award, Honorable mention „New Buildings“, 2010	Brauerei Liesing, ECOLA-Award, Honorable mention „New Buildings“, 2010
2010 Guest lecturer and guest critic at the Georg Simon Ohms Hochschule Nuremberg	since 2021 Member of the Advisory Board for Building Culture Graz	Residence Adele, Auszeichnung „gebaut 2020“ der Stadt Wien, 2020	Porsche Museum, Nominated for the Mies van der Rohe Prize, 2009	VOL. 1, Delugan Meissl Associated Architects, published by Delugan Meissl Associated Architects, Vienna, 2010, ISBN 978-3-9502979-0-4
2015 Silver Medal of the City of Vienna	Dietmar Feistel	University Campus Krems, Auszeichnung für Engagement im Klimaschutz, klimaaktiv Gold, 2019	Book „Porsche Museum“, Nomination to the Austrian State Prize „Most Beautiful Book 2009“, 2009	Porsche Museum Delugan Meissl Associated Architects HG Merz, published by Springer-Verlag, Vienna, 2010, ISBN 978-3-211-99738-3 (German), ISBN 978-3-211-99736-9 (English)
2015 Grand Austrian State Prize Member of international architectural juries	born in Bregenz, Austria Studied at the Technical University in Vienna	TEELA Zumtobel Office, reddot award 2019	TEELA Zumtobel Office, iF Design Award 2019	TEELA Zumtobel Office, iF Design Award 2019
Elke Delugan-Meissl	since 1998 Practice at Delugan Meissl ZT GmbH	MIBA FORUM LAAKIR-CHEN, 2nd Prize, 2A Europe Architecture Award 2018	MIBA FORUM LAAKIR-CHEN, 2nd Prize, 2A Europe Architecture Award 2018	MIBA FORUM LAAKIR-CHEN, 2nd Prize, 2A Europe Architecture Award 2018
born in Linz, Austria Studied at the University Innsbruck; Practice in Innsbruck and Vienna	since 2004 Partner at Delugan Meissl Associated Architects	High-Rise Wienerberg, Prize for Architecture of the City of Vienna, 2006	House Ray1, ARCHIP International Architectural Award, 2007	High-Rise Wienerberg, Prize for Architecture of the City of Vienna, 2006
		High-Rise Wienerberg, International High-Rise Award [Honorable mention], 2006	High-Rise Wienerberg, International High-Rise Award [Honorable mention], 2006	High-Rise Wienerberg, International High-Rise Award [Honorable mention], 2006
		Global Headquarters Sandoz, Contractworld Award	Global Headquarters Sandoz, Contractworld Award	Global Headquarters Sandoz, Contractworld Award

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