This course is one of the few academic in-depth investigations into the planning of animal facilities, drawing on an interdisciplinary collaboration between landscape architects, zoologist, biologists and specialist planners. Before drawing the first sketch this translates into nothing less than the ›invention of a new world‹.

The aim is not confined to sparking a discussion about contemporary animal husbandry, but also to provide important and innovative inspiration for facilitating an up-to-date transfer of construction-related knowledge to zoos. What are the outlines of the generally valid aspects of the design and which of these may be relevant for future building concepts? How can planners develop a design which successfully reflects the needs of animals, their keepers, visitors, and thereby the zoo.

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19

Research-Based Design Building for Animals

Research-Based Design
Building for Animals

Natascha Meuser

Hochschule Anhalt
Anhalt University of Applied Sciences

Research-Based Design
Building for Animals
A House for Pandas

This course was taught by Prof. Dr. Natascha Meuser and James Wong Zhen Fai (Interior Architecture).

Hochschule Anhalt / Dessau
Master Architecture / DIA
Studio Winter Semester 2019/20

Hochschule Anhalt
Anhalt University of Applied Sciences

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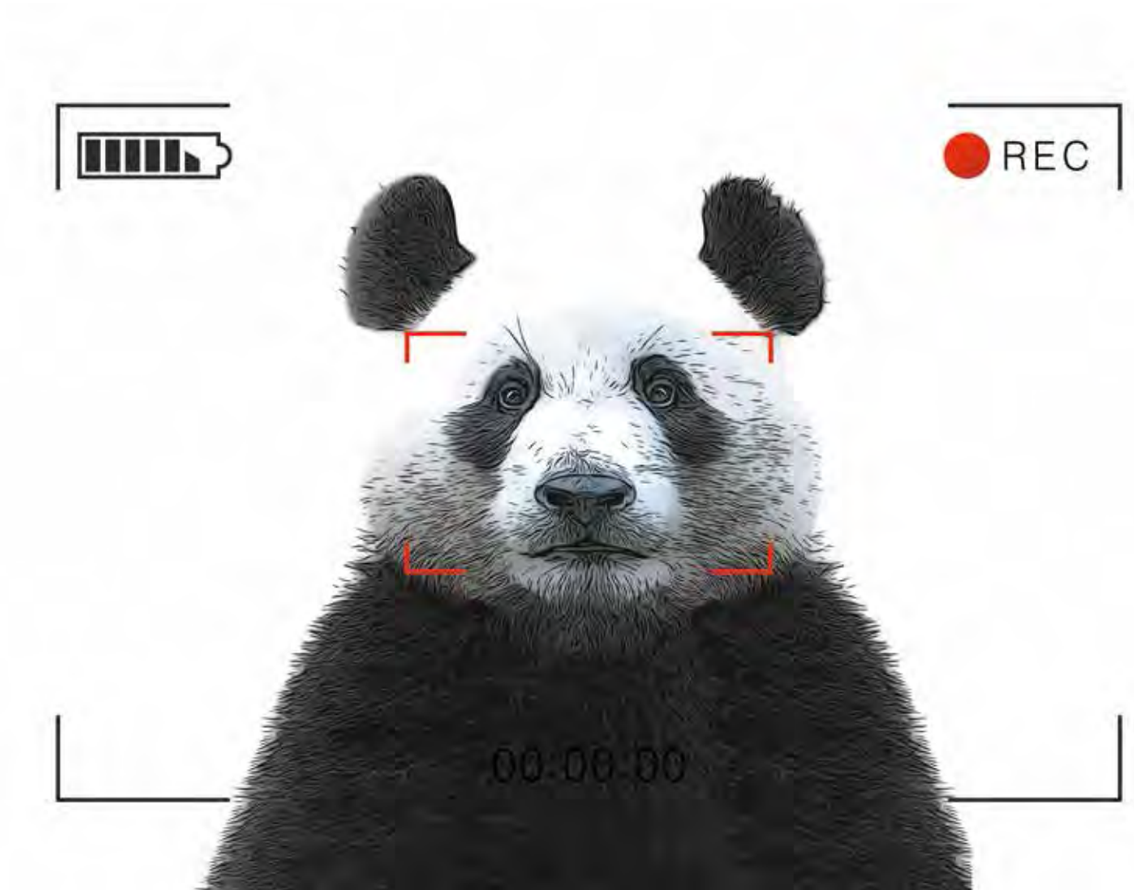
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»The creation of zoological gardens is arguably the second oldest and second largest biological experiment of humanity, a phenomenon of tremendous significance.«

Heini Hediger (1956)

Pandau house Beijing Zoo, China
Foto: kpzfoto / Alamy Stock Foto

Building for Pandas
Do Iconic Animals Need an Iconic Setting?

Natascha Meuser

How do humankind and animals, or architecture and zoology, fit together and relate to each other? The views of society on the optimal coexistence of humans and animals have changed fundamentally over time. This shift in the public perception of wild animals – from mere showpieces to beings with rights – is now more than ever a topical issue, especially in terms of how to accommodate these animals.

This seminar addresses an important question: how best to design buildings for animals, using the example of a panda house. The aim is not confined to sparking a discussion about contemporary animal husbandry, but also to provide important and innovative inspiration for facilitating an up-to-date transfer of construction-related knowledge to zoos. What are the outlines of the generally valid aspects of the design and which of these may be relevant for future building concepts? How can planners develop a design which successfully reflects the needs of animals, their keepers, visitors, and thereby the zoo? This course is one of the few academic in-depth investigations into the planning of animal facilities, drawing on an interdisciplinary collaboration between landscape architects, zoologist, biologists and specialist planners. Before drawing the first sketch this translates into nothing less than the ›invention of a new world‹.

»Pandas seem to bring out the best in people. And that is only one of about a thousand good reasons why we should keep them living on earth.«
Mary Pope Osborne: A Perfect Time for Pandas, Magic Tree House (R) Merlin Mission, Volume 48, New York 2012

Field Trip: Visit of *Dan Pearlman* office in Berlin, October 2019.
Pictures: Natascha Meuser

Kick-off event in the Zoo with Dr. Andreas Knieriem,
the director of *Zoo Berlin*.

Design Project Framework
Upon completion of this course, students will be able to: 1) Use scientific research to design buildings for animals, 2) Explain building history of zoo architecture 3) Determine fundamental architectural principles to meet the needs of the animal and visitors 4) Define planning parameters and quality standards for zoo buildings 5) Work interdisciplinary with parties involved in construction and planning.
By this stage students developed

- a brief through discussions with the client and other stakeholders,
- carried out an thorough site analysis, gaining as much information as possible about the site, surroundings and context,
- ideas that will provide a basis for their concept.

Project Design Brief
Following research and discussions students begin to build an understanding of the spatial requirements of the project like: functional program, floor area standards to carry out particular tasks, spatial relationship requirements to the site and context.

In this seminar students were required to produce their own brief, in which case they will be responsible for creating their own project and finding a site relative to their design idea. The program checklist helps to develop the project, areas of importance, areas that need clarity, and the general deliverables for the project. This must all be researched and analysed prior to formalising. Each selection should enclude:
Site: location, access, reasons for choosing, health and safety aspects, key elements or features;
Building: size, use, form, scale and hierarchie;
Narrative: coherent design, which corresponds to the user requirements;
Programme: areas, specialist items;
Zoning and Size: dimensional considerations such as boundaries, access, future expansions;
Landscape: natural features of the site such as trees, rocks, topography, ponds etc.;
Circulation: movement and circulation of men and animal in, through and around the site;
Climate: suitable for animal keeping;
Views: visitor and animal perspectives.

Through team design process students earn a deep understanding within the design process.

The interim presentation with guests create an individual reflection on the design results.

Step 1: Research-based Design
Formulating design parameters for buildings for animals is a challenge at first. The requirements of the building mean that planning parameters have to adapt to the scales and habits of both animals and human beings. Although this analysis by no means claims to be complete, by observation of these parameters, the design and planning of a panda house can be carried out. The section that follows is intended to serve as a planning aid for the development of a design. It can also be used as a communication platform if all parties involved in planning and construction want to agree on an optimal building concept. It should be stated at the outset that the concern here is architectural and pedagogical design parameters. That should also make it clear that the planning of a zoo building should be entrusted to an architect who will of course engage landscape architects and specialist planners. Only if the architect from the beginning creates a collaboration with specialist planners, can a design emerge that successfully reflects the needs of the animals, keepers and visitors.

Step 2: Methodical Design Solution
In this complex planning task there were many questions, that had to be solved. The methodical design process hereby helps the student to find a structured way of solving problems by using object-design-knowledge within a design team. The central aim of the course is to learn how to independently gain a deep understanding of a problem area, formulate the problem based on thorough research, and to develop an individual, interdisciplinary, and methodical design solution. By structuring activities and communication between the team members, the aim was to create an individual reflection on the design results.

Step 3: Final presentation
The sketching phase leads to the synthesis phase, where the design comes together. At this stage, the logistics of the building and site, the construction, the form and materials etc. become united into one entity. Finally, the presentation phase and public discussion covers all the material used to present and explain the project.

Master Architektur / DIA
Architectural Studio WS 2019/20
Building for Animals

CONDUCT RESEARCH

Field Trip
01 Dan Pearlman: Storytelling and Scenography as Design Methods
02 Natural History Museum Berlin: Biodiversity of Nature
02 Zoologischer Garten Berlin: A Walk with Dr. Andreas Knieriem

Exercises
01 The Aesthetics of Perspective. View into Nature
02 The Aesthetics of Biology. Construction of Nature
03 The Aesthetics of Abstraction. Integration of Nature
04 Draw Attention to the Story. To See a Problem from Multiple Angles
05 Create a Design: Understand the Nature and Context of your Concept

CREATE A DESIGN

Submission
The building site is chosen by each student and can be anywhere in the world. The physical, geographic, climatic and cultural context of the site must be documented.
- Create a design, including the outdoor spaces – both plan and rendering
- Provide floor plans, sections, elevations (scale of 1:200)
- Create a site plan (scale of 1:500) that places the design in its context
- Present all solutions relevant to the design
- Create a model (scale of 1:500)

Schedule

Week 8
Nov 27, 2019
Lecture

Week 10
Dec 4, 2019
Crits / Pin-ups

Week 11
Dec 11, 2019
Interim Presentation

Week 12
Dec 18, 2019
Consultation (see list)

Week 13
Jan 8, 2020
Crits / Pin-ups

Week 14
Jan 15, 2020
Workshop »Layout«

Week 15
Jan 22, 2020
Final Submission
(Documentation and Exhibition)

Week 16
Jan 29, 2020
PROJECT REVIEW

Submission

1. Information on the project
A brief description of the design task; length: ca. 500 characters; Author of the design, title, teaching domain, supervisor
(Word file, unformatted, DOC)

2. Images and Illustrations
Photos, illustrations, graphic elements (EPS or TIF formats) – resolution of at least 300 dpi, *Color mode: RGB oder CMYK; as JPG, PSD, TIF or EPS files*

3. Drawings
Drawings which promote an understanding of the building/project (site plans, floor plans, elevations or sections, if appropriate), details of execution, sketches, manual drawings; *(PDF, TIF or EPS file)*

Please sample and label the files:
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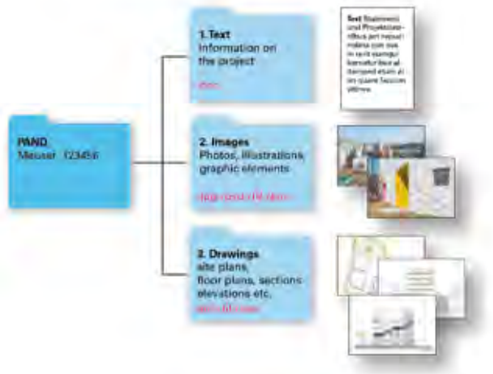
Files: PAND_Name_naming

Example: *PAND_Meuser_236789*
PAND_Meuser_Section.pdf



Dem größten Landsäugetier der Erde sind nur circa 20 Prozent seines ursprünglichen Lebensraums geblieben. Trotz dieser Bedrohung ist Wilderei noch immer die größte Gefahr für den Elefanten

AFRIKANISCHER ELEFANT

SCHÖNHEIT UND VIELFALT DER NATUR VERBLASSEN

Würden Sie mit mir um einen Fisch trauern? Wir am Museum für Naturkunde in Berlin tun es: Wir trauern um Gesichter des Lebens, um Arten, die der Welt verloren gegangen sind. Für immer dahin, ausgelöscht aus dem 3,8 Milliarden Jahre alten Stammbaum des Lebens. In diesen Tagen bewegt uns das Aussterben des Chinesischen Schwertstörs. Er war eine imposante Kreatur, bis zu drei Meter lang, und lebte im Jangtsekiang. Soeben wurde er offiziell für ausgestorben erklärt, vertilgt von Dammbauten und Überfischung.

Wenn Sie bis zu dieser Seite geblättert haben, haben Sie einen Eindruck von der Schönheit und Vielfalt des Lebens gewonnen – durch die Bilder von Joel Sartore, der es sich zur Lebensaufgabe gemacht hat, Tieren aus aller Welt eine fotografische Arche zu bauen. Fast 10 000 Arten hat er schon porträtiert, doch allein das Museum für Naturkunde in Berlin beherbergt mehr als 30 Millionen Objekte. So gewaltig die Aufgabe ist, die noch vor dem Fotografen läge, wollte er einen kompletten Katalog des Tierlebens erstellen, so gewaltig ist die Bedrohung gewachsen, der die Artenvielfalt auf der Erde ausgesetzt ist. Sie geht vom Menschen aus.

Um das zu sehen, muss ich nicht auf die Berichte der Zoologen und Botaniker aus fernen Regenwäldern und von überfischten Meeren warten. Ein Spazierweg, den ich seit Kindertagen kenne, reicht dafür aus. Er liegt im Frankenwald, ein Feldweg, wo einst die Autobahn vor den Grenzen von DDR und ČSSR zu Ende war. Damals bin ich ihn oft gegangen, jeden Sommer war er gesäumt von bunten Blüten aller möglichen Feldblumen. Heute sind sie alle fort, nur Gräser gedeihen dort noch.

Um diese Schönheit und Vielfalt zu vernichten, war es nicht nötig, Gift zu sprühen oder bestäubende Insekten auszutilgen. Die extreme Intensität unserer Nahrungsmittelproduktion reichte aus. Denn all den kleinen Blumen in meiner Erinnerung ist eines gemeinsam: Sie können einem Überschuss an Stickstoff nicht widerstehen. Überdüngung raubt ihren Lebensraum. Heutzutage fällt allein mit dem Regenwasser etwa so viel Stickstoff auf unser Land herab, wie die Bauern in den 1950er Jahren als Dünger auf die Felder brachten. Das ist der Fluch der Überproduktion, das ist der wahre Preis des billigen Koteletts.

Ich bin Biologe, Botaniker, mit zwölf Jahren erwachte in mir die Liebe zu den Pflanzen. Ich sehe sie sterben, so wie die Zoologen die Tierwelt, so, wie Joel Sartore auf seinen Reisen um die Welt die Aussterbenskrise erlebt hat: Wenn man ➤

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(mit Genehmigung zum Nachdruck)

nicht ein frohgemuter Mensch wäre, man könnte Tag und Nacht weinen.

In Wahrheit ist das, was dem Leben auf unserem Planeten widerfährt, eine Krise der Kultur, eine Krise der menschlichen Vernunft. Ich habe noch Hoffnung, dass wir umkehren, aber ich befürchte auch, dass sich im Stillen viele damit abgefunden haben, dass wir die Natur buchstäblich vergessen können.

Bevor ich nach Berlin kam, arbeitete ich in Großbritannien. Umso schmerzlicher war es, als ich erfuhr, dass in Darwins Heimat vor wenigen Jahren in einer der wichtigsten Enzyklopädien für Kinder viele Begriffe aus der Naturkunde durch Wörter aus der Computersprache ersetzt wurden. Eichel und Kastanie machten Platz für Blog und Chatroom. Nichts spricht dagegen, dass Kinder moderne Technik lieben, aber alles gegen die Gedankenlosigkeit, die Natur, deren Teil unsere Kinder sind, in ihrem Geist bereits verblassen zu lassen.

Charles Darwin hat uns ein Erbe hinterlassen, das ihm sogar noch wichtiger war als die Lehre von der natürlichen Selektion. Es ist die Erkenntnis von der gemeinsamen Abstammung allen Lebens. Dieses hat, trotz seines für uns unvorstellbaren Alters von 3,8 Milliarden Jahren, nur eine Wurzel. Mit allen Lebewesen, die Sie auf diesen Seiten sehen, sind Sie und ich verwandt. Wie die vielen Arten, die den Weg bis in die Gegenwart nicht gegangen sind, sind aber auch wir Menschen ganz sicher nicht unsterblich. Ich finde, es ist nicht zynisch, wenn ich sage: Ich bin sicher, dass das Leben sich auch von der Aussterbewelle, die wir provoziert haben, erholen wird. Doch kann es gut sein, dass unsere Spezies, sollte die Katastrophe weiter eskalieren, nicht mit an Bord der Arche sein wird, die in das nächste Erdzeitalter ausläuft.

Habe ich Hoffnung, dass wir unseren Irrweg verlassen können? Ja, denn es verändert sich gerade etwas. Im vergangenen August öffneten die Berliner Museen ihre Tore zu einer Langen Nacht. Ich durfte erleben, wie 10 500 Menschen zu uns kamen. Unser Haus hat den Ruf, dass eine jede und ein jeder vor allem kommt, um unseren großen Dinosaurier Giraffatitan zu sehen: dass stets der Blick nach oben geht, um ihm in die Augen zu schauen. Doch in dieser Nacht war das nicht so – die jungen Menschen kamen vor allem, um mit unseren Wissenschaftlerinnen und Wissenschaftlern zu sprechen, um zu erfahren, wie man die Natur erforscht, ihre Geheimnisse enthüllt, unsere Zukunft bewahrt. Das macht mir Mut. So erfüllen wir den Auftrag der modernen Forschungsmuseen der Leibniz-Gemeinschaft: Demokratie stärken und lernen, Gesellschaft und Wissenschaft neu zu verbinden.

Ja, es gibt Widerstand gegen die heute so dringend notwendigen Einsichten. Manche haben Probleme damit, uns Forscherinnen und Forschern zu glauben, wie ernst die Lage ist, wie entschlossen gehandelt werden muss.

Sich auf die Natur einzulassen heißt etwa, zu begreifen, dass mit dem Chinesischen Schwertstör nicht nur ein Fisch für immer verloren ging. Denn dieser Stör wird eine einzigartige Darmflora besessen haben, die mit ihm unterging. Zu seiner Plage beriedelten ihn gewiss auch einzigartige Parasiten. Wahrscheinlich spielte er darüber hinaus eine entscheidende Rolle in den Lebenszyklen anderer Organismen, die nun ihrerseits bedroht sind.

Wissenschaftlerinnen und Wissenschaftler wie ich sind keine abgehobene Elite, die anderen Menschen hochmütig Anweisungen erteilen will. Unsere Sorge ist aufrichtig, und immer stärker teilen engagierte Bürger unsere Bemühungen. Sie waren es, die mit der Krefelder Insektenzählung den Anstoß gaben, über die Gefährdung unserer Bienen und Käfer zu sprechen. Mit Fleiß und Apps zählen sie Nachtigallen oder messen Umweltbelastungen und teilen ihr Wissen in Stadt und Land. Mit meiner Trauer um die Lebensformen, die täglich verloren gehen, paart sich auch deshalb Zuversicht, dass wir eine große Vielfalt von Arten retten können – und dass unseren Kindern nicht nur die Bilder von Joel Sartore als virtuelle Arche des Lebens bleiben, dass diese Fotografien nicht zu Denkmälern werden, dass mein Forschungsmuseum nicht zum Mausoleum wird. ✖

„HABE ICH HOFFNUNG? JA, DENN ES VERÄNDERT SICH GERADE ETWAS“

Johannes Vogel ist Generaldirektor des Museums für Naturkunde in Berlin und Professor für Biodiversität an der dortigen Humboldt-Universität. Am Herzen liegt ihm „Citizen Science“, Forschung für jedermann

Joel Sartore Der Noah der Naturfotografie

Sartore bei der Arbeit in den Everglades, Florida

Er verkörpere, sagen seine US-Kollegen, die sprichwörtliche Arbeitsethik des Mittleren Westens: **Joel Sartore** wuchs in Nebraska auf, wo er bis heute lebt. Als langjähriger Fotograf des Magazins „National Geographic“ hatte Sartore bereits die Landschaften der gesamten Erde und ihre einmaligen Tierwelten erlebt. Doch obendrein nahm er sich ein Projekt vor, das in Sachen Ausdauer und Hartnäckigkeit ganz seinem Charakter entspricht: Porträts aller rund 12 000 Tierarten aufzunehmen, die der Mensch in zoologischen Gärten, Wildparks und Schutzstationen hält. Jedes Tier wird dabei vor weißem oder schwarzem Hintergrund fotografiert, denn es soll für sich selbst stehen. Jedenfalls im Bild. Denn tatsächlich ist, so will es das Konzept der „fotografischen Arche“, jedes Einzelwesen, das Sartores Bilder zeigen, zugleich Botschafter: Nicht alle, aber erschreckend viele der gut 9800 bislang dokumentierten Arten sind bedroht. Der Orang-Utan und die Madagassische Schnabelbrustschildkröte, die der Arten auf diesen Seiten zeigt, gehören zu den besonders vom Aussterben bedrohten Tieren überhaupt. In beiden Fällen, wie meistens: beim Schwund von Biodiversität, ist hier eindeutig der Mensch der Täter. Er tilgt seine schwächere Verwandtschaft aus. Sartores wichtigstes Anliegen ist daher, den globalen Artenschutz zu fördern und jeden zum Mittun aufzurufen. Joel Sartores prächtiger Bildband **„The Photo Ark“** ist in mehreren Ausgaben bei National Geographic erschienen – auf Deutsch unter dem Titel **„Arche der Tiere“**, NG Buchverlag, 49,99 Euro.

Building History

Animal enclosure in Ethiopia (2011)
Photo: Prisma by Dukas Presseagentur GmbH

Zoo Buildings
The Wild Animal – From a Showpiece to a Being with Rights

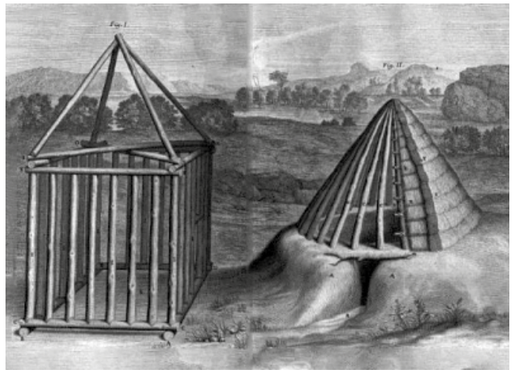
Natascha Meuser

Man and animal, architecture and zoology: how do these various elements fit together and relate to each other? Society's view of the optimal coexistence of humans and animals has changed fundamentally since the first scientifically managed zoological garden was built in Paris in 1793. This change in human conceptions of the wild animal – from a mere showpiece to a being with rights – is now more than ever a topical issue.

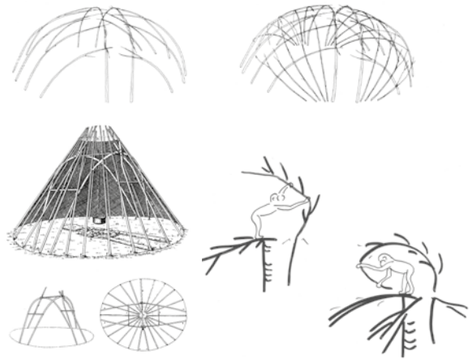
The project in the winter semester of 2019/20 deald with the construction of a new panda house. Before the first sketch is drawn, the question of the future inhabitants of the facility must first be clarified. For the dramaturgy and staging of buildings and fauna, this means nothing less than the ›invention of a new world‹. The core principles for the design must be developed through research and then implemented and presented in a concrete design. The final works should not only spark discussion about contemporary animal husbandry, but also provide important and innovative inspiration for the up-to-date transfer of knowledge in zoos.

Structural principles were taught in cooperation with the Membrane Structures degree programme. Students could further explore and refine their design as part of a concurrent elective course, such as Textile-, Tensile- and Cushion Constructions or Lightweight Membranes. Students were engaged with the subject matter systematically through exercises and organised their work independently.

The central aim of the course was for students to learn how to independently research and analyse a design problem and to develop an individual, interdisciplinary, and methodical solution. To consider architecture as an alliance of form, biology, and ethics unleashes new and exciting possibilities in the design of zoo buildings. The students also identified the need for a rigorous, visionary new agenda regarding buildings for animals, one that pursues animal enclosures as a steppingstone towards a new relationship between architecture, nature, and the built environment. One that puts the wild animal to a being with rights.



Claude Perrault: Buildings of the Colchians and Phrygians.
Les dix livres d'àrchitecture de Vitruv,
Paris 1673, Plate 5

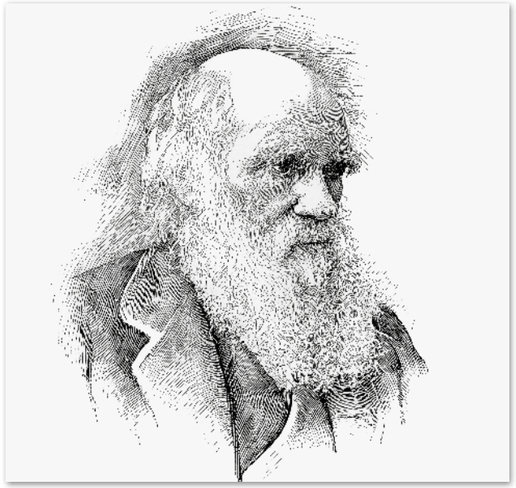


The construction of a *Zeltkote* (Rolf Kjellström 2003) or dome-shaped hut (Enrico Guidoni 1939) is based on the same design principles as chimpanzees use for nest building (Jane Goodall 1962)

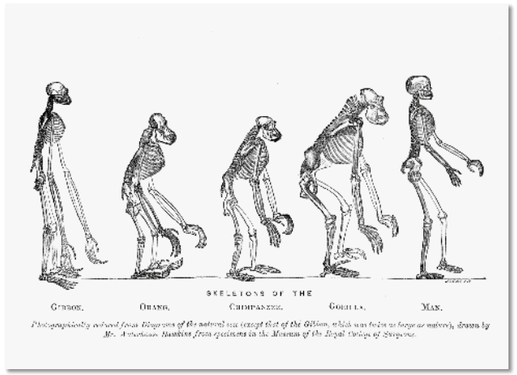
With society's increased environmental consciousness and improving animal-keeping methods, architecture is fading from the zoo, as if a landscape park could disguise the fact that the animals are imprisoned.

In the course of social change and especially in light of heightened concern for protection of nature and wild animals, design guidelines have fundamentally changed. Along with the rapid progress in technical developments over the last 150 years, which have made zoo buildings safer and more comfortable, a manifold pluralism of forms and styles for animal dwellings evolved.
»Artificial surroundings are as old as mankind itself.«[1] Is this insight of Aldo Rossi, the architect and architectural theoretician, also applicable to the artificially created surroundings of animals in zoos? Building typologies have always developed in tandem with the relevant human needs but to what extent can the needs of animals exert an influence on the architectural type? Internationally, the zoo as housing for animals has undergone a similar development. The designs of zoos in various social milieus and climate zones resemble each other. A zoo in Jakarta looks basically the same as a zoo in Wrocław. The zoo is integrated in the urban development, fenced in and consisting of many different buildings, from aviaries to stables, to wooden or solid structures. It has its own infrastructure, a pathway system, and facilities including shopping and supply outlets. Then there is the scientific requirement of zoology. A consistent development of zoo buildings can be discerned beginning in the mid-nineteenth century, in the wake of the bourgeoisie emancipation.
Since human beings began building their own dwellings, they also erected facilities for their domestic animals, either a simple fence to keep livestock from running away or a stall to protect it from weather and predators. However, well into the twentieth century, the subject of building structures for animals was largely ignored in building theory. This deficit also applied to zoo buildings, a type of building that emerged during the Baroque period as the zoological garden, evolving into the colonial era with the imagery of exotic worlds, and developing in the modern period into an independent architecture. For the most part, the designs were oriented to stage sets, circus-like shows, and prisons. The architects, if they had not been replaced by a zoo director with architectural ambitions, applied an architectural understanding of zoology. The result can be seen today: architecture as a contribution to building culture has almost completely vanished from the zoo and has been replaced by amorphous constructions that democratically cater to every need, as Urban Entertainment Centres, souvenir shops, restaurant facilities, restrooms, playgrounds, and ice cream stands, with the requisite shrubbery, bark mulch, and wheelchair accessible paths. According to the principal of »the squeaky wheel gets the oil« the lobby that makes the most noise is awarded the largest space. One could almost get the impression that the zoo buildings are missing exactly what they purport to provide, namely animals and appropriate architecture.
In this sense, the architect elevates nature in order to achieve an ideal form. But the term of nature has the drawback of being constantly subject to change. For instance, during the Enlightenment, nature stood for the work of a God who had constructed his Creation according to a principle of order, while during the Romantic period the idea of this image became one in which it was precisely the disordered – apparently coincidental – that was the focus of attention. And if one continues in this vein today, the question inevitably arises: what do architects want to express by employing, in abstract form, the shape of an animal's body as inspiration for a building, as Santiago Calatrava has done with his skeleton-like constructions or as Zaha Hadid did with her stadiums in the form of a stream-lined insect carapace. The same is true for building for animals, as zoo architecture, in a way, demonstrates in its subjection to continuous change. Where animals at first were locked behind bars or prevented from escaping by trenches, beginning in the twentieth century they are presented on stages, only to disappear again today in practical amorphous structures, which, according to Georg Wilhelm Friedrich Hegel, would mutate as the »organic form into the root of free architecture«. This consciousness transformation also pertains to the animal

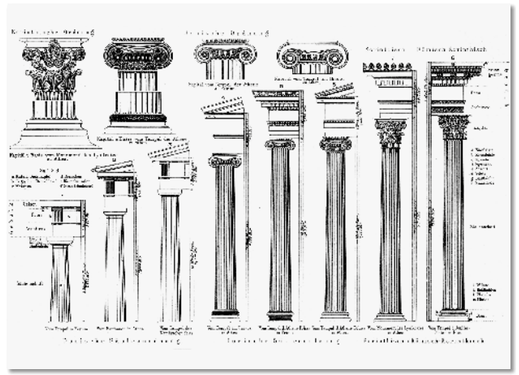
1 Rossi, Aldo: Die Architektur der Stadt. Skizze zu einer grundlegenden Theorie des Urbanen, Düsseldorf 1973, p. 26.



Portrait of British naturalist and evolutionist Charles Darwin
Source: iStock/Steven Wynn



Comparison of the skeletons of gibbon (twofold magnified), orangutang, chimpanzee, gorilla, and human
Huxley, Thomas H.: Evidence as to Man's Place in Nature



Comparison of the classical order of columns of antiquity
Meyers Kleines Konversationslexikon. Vol. 1,
Leipzig and Vienna 1892, p. 194

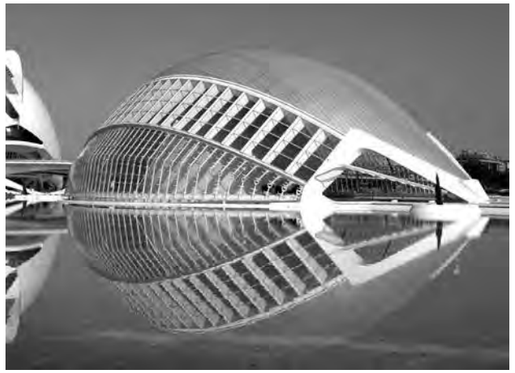
itself. If animal creatures were formerly considered as more or less demonic, during the Enlightenment they were revamped as machines, to which one began little by little to ascribe consciousness and individuality. There are philosophers today like Richard David Precht who propose that animal rights should be guaranteed a coexistence along with human rights, for which he has formulated an Ethic of Ignorance (*Ethik des Nichtwissens*).[2]
The work of the British naturalist Charles Robert Darwin broke the ground for the paradigm change of the image of the animal-as-beast to the animal-as-creature. In *On the Origin of Species by Means of Natural Selection, or The Preservation of Favoured Races in the Struggle for Life*, published in 1859, the contemporary of Hegel formulated his theory, still valid today, which is divided into five subsections. To begin with, he postulates that (1) living creatures are subject to an evolution, not exactly a new idea in Darwin's time because »almost every naturalist supported the great principle of evolution«[3]. This principle states that the types of life forms are not static but constantly changing. Furthermore, Darwin poses the thesis that (2) all living creatures, human beings along with animals, share a common origin: »All the members of whole classes can be connected together by chains of affinities, and all can be classified on the same principle, in groups subordinate to groups. Fossil remains sometimes tend to fill up very wide intervals between existing orders.«[4] Darwin explained that change with (3) gradualism, is with the assumption that the smallest modifications ultimately lead to great changes. According to Darwin the relevant magnitude here is not the individual but (4) the population. Finally Darwin introduces (5) selection in the form of the famous »survival of the fittest« as a central mechanism for selection. Those living creatures will survive that can best adapt to their surroundings. The appearance of a species or genus then becomes the solution of the problem posed in the life environment. In a sense, Darwin's theories can be related to the evolution of architectural styles. Architecture has not been static over the centuries, but characterised by style changes. Changes in context, ie culture, politics, climate, technology, or similar parameters lead to modifications in building construction. This rarely occurs in evolutionary leaps, but usually in small steps. And architecture is also always a solution for construction-temporal problems. People react to their environment and develop buildings for specific requirements. As curious as individual designs may appear – especially from a temporal distance – they too have emerged as a result of a lifeworld examination, for example regarding economic, constructive, and functional framework conditions. Some appear to be successful and are then copied and handed down. Other styles, which are not considered to be efficient responses to the existing problems, find no or ever fewer imitators, and eventually die out – in the sense of the theory of evolution.

In terms of the zoo and zoo architecture, that means human architecture for presenting animals must adapt to the specifics of each case. The conditions of their life environment to which the living creatures had to react in their evolution must in part be reflected in the construction of their enclosures, even if natural selection no longer plays a significant role in that evolution. This means that architecture for zoo buildings must adapt to a great variety in natural living spaces. That is a tremendous task that requires a great knowledge of art. The search for the greatest degree of naturalness inevitably leads to the greatest degree of artificiality in the detailed simulation of the living space. In addition to the requirement that the zoo must be built to serve the animals as well as human beings, the building should provide an exhibition context in order to make the presentation easy to understand. Building for zoo animals then becomes an infinite loop in the sense that zoo architecture attempts to create an environment as appropriate for the zoo visitor as it is for the animals. According to Darwin, animals adapt to the environment in which they find

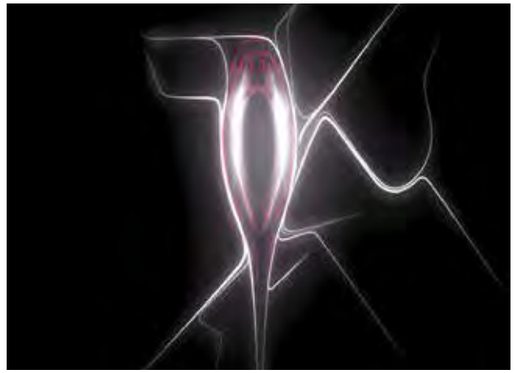
2 Precht, Richard David: Noahs Erbe. Vom Recht der Tiere und den Grenzen des Menschen, Reinbek b. Hamburg 2000.

3 Darwin, Charles: On the Origin of Species by Means of Natural Selection, or The Preservation of Favoured Races in the Struggle for Life, London 1859.

4 Ibid.



Santiago Calatrava: Cultural building in the shape of
a human eye in Valencia 1998
Photo: Rainer Bergner



Study to find the shape of the Olympic Stadium
in Tokyo 2020
Zaha Hadid Architects

themselves. Now, after over one hundred years of experience with modern zoological gardens, the question can be posed: what is actually being built and for whom? Capturing animals in the wild and locking them up in zoos, at least in the so-called western countries where animal welfare is high on the list of priorities, is unthinkable.[5] But wild animals that have spent several generations in human captivity, sooner or later give up being truly wild. In a sense, they become a special kind of pet.
Nowadays, the animals that are capable are reproducing in artificially created zoo environments. In other words, by contributing to a new life environment, the zoo is influencing the animal's evolution and generating a new form of pet, namely zoo animals, which have the ability to withstand this kind of captivity without perishing. What emerges over time is a highly artificial system with two components, neither of which have anything to do with what used to be called nature. Theodor Adorno traced the origins of zoos back to the nineteenth century and aptly analysed them in his Minima Moralia reflections.

»In their true form, zoological gardens are products of nineteenth century colonial imperialism. They flourished in the wake of the exploitation of wild areas of Africa and central Asia, which paid a symbolic tribute in the guise of live animals. The value of the tribute was measured by how exotic or difficult to obtain it was. The development of technology put an end to that and banished the exotic. The lion bred on the farm is just as tame as the horse that has long been subdued by birth control.«[6]

Of course, this idea is a product of civilisation and denaturalising wild animals can hardly be the goal of modern zoology. In order to find a starting point to formulate an architecture theory for building zoos, it is best to return to Darwin's time, a century before Adorno's work on the mutation of lions in captivity. The first half of the nineteenth century was marked by research expeditions and nature observations, by surveying, charting, and documenting new regions and landscapes. New life had been breathed into the debate about the origins of life because of the countless discoveries of previously unknown species. Charles Darwin was the first researcher to formulate, in written form, a theory of evolution from the fill of his own research results and the literature of colleagues. His thesis called into question the view supported by the Christian church that could not accommodate the origin of human beings from apes in the story of creation. Representatives of the humanities were ecstatic about these new findings. As described by Darwin, the evolution theory rode a wave of popularity. The architect and founder of modern architecture theory, Gottfried Semper, adopted Darwin's ideas and related them to his own. After demonstrating for civil rights, in Dresden's May 1849 uprisings, Semper relocated to England, where he met scientists from the intellectual circles and salons in the radius of Darwin. As a political refugee, he found himself in the company of the philosophers Karl Marx and Friedrich Engels. At first, Semper resumed writing in London, continuing his studies about the colour scheme of antique temple buildings. During his exile, other subjects occurred to him, such as applying science to architecture. As the centre of a colonial empire, London was the perfect location for such a viewpoint and it was there that Sempercompleted one of his most important works: *Die vier Elemente der Baukunst*. In it, he discusses the lawfulness of determining design according to nature. In classicism, the theory of style was based on construction as the most important architectural element, thereby freeing it from ›fake frills‹. But, as Semper continued, should architecture not acknowledge nature as a teacher, giving her form and expression in the shape of an architectural idea?[7]

5 The World Association of Zoos and Aquariums (WAZA) adopted in 1993 the first World Conservation Strategy, setting standards and guidelines for zoos and aquariums worldwide.

6 Adorno, Theodor W.: Minima Moralia. Reflexionen aus dem beschädigten Leben, Frankfurt am Main 2001, p. 212.

7 Semper, Gottfried: Die vier Elemente der Baukunst. Ein Beitrag zur vergleichenden Baukunde, Braunschweig 1851, p. 53–54.

It is obvious that Semper's ideas were coherent with the naturalists' and zoologists' intellectual property. The influence of Darwin's research on Semper's architecture theory becomes evident in comparison to the manual *Der Stil* (1860) and the lecture *Ueber Baustyle* (1869)[8]. In both works, Semper examined the question of architectural style. In the preface of his manual for engineers, artists, and art aficionados in 1860, he writes about archetypal forms in nature and their relevance for creating style in architecture.

»Nature, in its infinite abundance, is extremely sparing in its motives – as is shown by a constant repetition in its basic forms. How are these modified a thousandfold in the stages of the creatures' education and according to their various conditions of existence? In other parts, it is suggestively manifested how nature has its developmental history, within which the old motifs are repeatedly seen through every new design. Equally so, art is subject to only few normal forms and types that derive from the earliest traditions, yet in constant recurrence to offer an infinite variety, and have their own history, just as those natural types. Nothing is pure arbitrariness, but everything conditioned by circumstances and conditions.«[9]

This understanding of art is still in the spirit of the academic approach to the arts by which art can only be based on what already exists, following a strict canon of form and style. For instance in the main section of the third chapter, Semper underscores this hypothesis: *Textile Art with Illustrations from Snake Motifs in Various Cultural Circles*. He typically makes use of animal motifs to emphasize the unity of art and nature. Semper here refers to the term *knot* (from the Latin *nodus*, or French *nœud*) and its etymological affinity with the word node. Two aspects are of interest. First, Semper makes an issue of the aesthetisation of spatial borders, which he develops in the following sections. Second, he derives a generally valid definition from the word and its use in other languages. In a way that is typical for him, Semper lays the foundation for an understanding of architecture theory, still applicable today. His ideas on the development of style deserve special attention because they resemble Hegel's ideas about nature: Hegel posits organic forms of nature that are abstracted by art while Semper draws attention to the smallest basic forms of nature, seeking to recognize an abstraction of form within. For Gottfried Semper, whose nephew, the zoologist Karl Gottfried Semper was in close professional contact[10] with Darwin, it is striking how much the original position changed.

8 Darwin's influence on Semper has been suggested by Harry Francis Mallgrave in his Semper biography. See Mallgrave, Harry Francis: Gottfried Semper. Ein Architekt des 19. Jahrhunderts, Zürich 2001, p. 320–321.

9 Semper, Gottfried: Der Stil in den technischen und tektonischen Künsten oder Praktische Ästhetik. Ein Handbuch für Techniker, Künstler und Kunstfreunde, Frankfurt am Main 1860, p. VI.

10 Numerous letters from Charles Darwin to Karl Gottfried Semper are documented in the University and State Library of Düsseldorf.

»An important extension of his theory was also the reference in the Zurich lecture to Darwin's Origin of Species and to those historians who saw architecture history as a kind of deterministic biological model determined by laws of natural selection, inheritance, and adaptation.«[11]

This fascinating reference from 1869 shows, »that even at this early stage, the social application of the Darwinian theory came into fashion within history and art. Semper's argument was directed against the axiom, which read: Art makes no leaps. He argued that art in fact makes leaps, often through the creative genius of a single individual.«[12]

»*The old monuments are rightly called the fossil casings of extinct social organisms, but these are the latter as they lived, not like snail shells on their backs, nor are they shot after a blind natural process like coral reefs, but free formations of the human being to set mind, nature observation, genius, will, knowledge, and power in motion. Therefore, the free will of the creative human mind is the chief factor in the question of the origin of architectural style, which, of course, has to move within certain higher laws of tradition, requisite, and necessity in its creation; but these, through free conceptions and exploitation, appropriates and serves, as it were.«*[13]

Semper picks up two lines of argument. In the first he establishes his position on the relationship of art and nature, in which he maintains that the new can only by developed by changing the old. But in contrast to art, he maintains that architecture must also fulfil a practical function.[14] In the second, he combines Darwin's theory with his own position on the evolution of architectural form, which he makes clear in the description of the »Monumente als die fossilen Gehäuse ausgestorbener Gesellschaftsorganismen (Monuments as the fossilised shells of extinct social organisms)«[15] and other comparisons to dwellings built by animals. As the Vienna architecture historian Gabriele Reiterer once wrote, Gottfried Semper developed his theoretical framework in parallel to the ordering of nature.

»*He built theoretical work on an evolutionary-historical, functional-morphological framework. In doing so, he created a completely new intellectual approach to architecture. His comparative systems and his search for original forms in architecture are closely correlated with the emerging comparative anatomies. Semper explained that, as with science, in conceiving the development of architecture, one must incorporate the origin and development of building styles in an ordering system. Put simply, he founded an evolutionary theory of architecture.«*[16]

11 Mallgrave, Harry Francis:Gottfried Semper, Zurich 2001, p.321.

12 Ibid.

13 Semper, Gottfried: Ueber Baustile (Ein Vortrag gehalten auf dem Rathaus in Zürich am 4. März 1869). In: Semper, Manfred and Hans (Ed.): Kleine Schriften von Gottfried Semper, Berlin / Stuttgart 1884, p. 401.

14 »Nur einen Herrn kennt die Kunst, das Bedürfnis.« In: Semper, Gottfried: Vorläufige Bemerkungen über bemalte Architektur und Plastik bei den Alten, Altona 1834, p. VIII.

15 Semper, Gottfried: Ueber Baustyle, Berlin / Stuttgart 1884, p. 401.

16 Reiterer, Gabriele: Die Biologie des Bauens. Wie Charles Darwin die Baukunst beeinflusste: Hinweise auf eine Evolutionstheorie der Architektur, in: Die Presse (Spectrum) on 28 February 2009.

Reiterer attributed to Semper a »highly creative and bold theory, a daring new look at the development of architecture.«[17] That approach placed Semper in opposition with Otto Wagner, who had formulated an architecture theory in Vienna at the same time in which engineering was elevated to an art form. Semper's theory ought to have been pursued because his analogies to evolution theory, together with the personal acquaintance of the Darwin and Semper families, represents a key to understanding the establishment of a modern theory of zoo architecture. However, Semper's theory also reflects an understanding of architecture based on a definition of space beyond its boundaries, that is, a view of dimensions that does not depend on the object in space. It bears a close proximity to the design parameters for the hybrid zoological building merging the elements of theatre, museum, and prison. The design is focused on the boundaries between the spaces, either those between the animals' territory and the public area of the zoo visitor, or between the inside and outside enclosures. Even if zoo architecture during Semper's time was characterised by the idea of exhibiting an exotic beast and behavioural research was not established as a discipline, his theoretical reflections during his lifetime are as valuable as a blueprint today.

»Once again, we are confronted with the notable case that the spoken language comes to the aid of art prehistory, which the symbols of stylistic idiom in their primitive appearance underscore, confirming the authenticity of their interpretation. In all Germanic languages, the word *Wand* (sharing the same root and meaning with *Gewand*), directly recalls the origin and typology of the visible space closure. This also true of *Decke* (blanket / ceiling), *Bekleidung* (cladding / clothing), *Schränke* (barrier / gate), *Zaun*, synonymous with *Saum*, or seam (fence) and many other technical expressions that are unmistakable indications of the textile origins of these construction parts.«[18]

Gottfried Semper's theoretical essays underpin his basic understanding that architectural styles had developed from the textile arts. The etymology of these terms reveals this kinship. Since these texts always involve words and terms for spatial transitions, like the word *Zaun* (derived from *Saum*, or seam) or *Wand* (derived from *Gewand*, or robe), they go to the core of architecture theory. Furthermore, Semper provides a kind of theoretical blueprint for architecture design that traces back the façade or enclosure to its textile handicraft origins. In that respect, this conclusion is significant because it helps derive quality criteria for contemporary architecture. For zoo architecture that means that in the zoo, wickerwork or artistic decorations should be discernible in a fence, and a façade ought to obey its tectonic lawfulness, which however does not mean that a fence should imitate a tree stump or be represented by an artificial cliff. By the same token, a façade does not have to resemble an elephant hide. Heini Hediger's statement that for the animal it is »certainly of no consequence whether its space is cordoned off with traditional means, or instead of gratings with ditches or similar means«[19], is still valid today. The beautifications in contemporary large-scale buildings in zoological gardens are there to amuse the visitors. They conceal a condition that is anything but natural. The enclosure is still a mixture of stage and prison, augmented in the visitors' space by a museum.

But a theory of zoo architecture would be incomplete without an investigation of terms that are as often used in architecture as in zoology. The term being (*Wesen*) in the sense of a living being (*Lebewesen*) in zoology comes to mind. One is reminded of August Schmarsow, who plays with terminology drawn from architecture and nature in his book *Das Wesen der architektonischen Schöpfung*.[20] In his Leipzig inaugural lecture, in 1893, the art historian Schmarsow considers architecture from the viewpoint of a history of creation. The term ›being‹ plays a special role here as it does for later theoreticians. For example a glimpse in the literature of the 1920s, a period of manifestos and many theoretical discussions, offers reference points. One of them is the architect Leo Adler, whose book *Vom Wesen der Baukunst* was published in 1926. Even if the term ›being‹ (*Wesen*) has several meanings in German today, it can be traced back to the Old High German verb *wesan* (to be). In English translations like nature, creature, or character come closer to the ideas of creation and nature. The term ›being‹ describes the *Eigentliche* (real), the *Essenz* (essence) or the *Kern* (core) of the matter in philosophy, while in architecture theory the question of fundamental being is the absolutely central theme.[21] The work titled *Grundriß der Allgemeinen Zoologie* by Alfred Kühn[22] may be recommended if one wishes to examine the theoretical analogies between architecture and zoology. The work published sixteen times between 1922 when it was first published and 1969. It describes the general characteristics of living beings and the tasks of zoology. In the main chapters, Kühn delves into the structure, performance, and evolution in the animal world. The choice of key words in the text is interesting as is the contextualisation of the language of zoology and architecture. In his instruction manual, Kühn makes use of terminology drawn from architecture.

»*Forms that are systematically categorised are called ›form related‹ or ›type related‹. They are constructed according to a common blueprint or type. They consist of similar parts in a coherent order.*«[23]

17 Ibid.

18 Semper, Gottfried: Der Stil in den technischen und tektonischen Künsten oder Praktische Ästhetik: ein Handbuch für Techniker, Künstler und Kunstfreunde, Vol. 1: Die textile Kunst: für sich betrachtet und in Beziehung zur Baukunst, Frankfurt am Main 1860, p. 229.

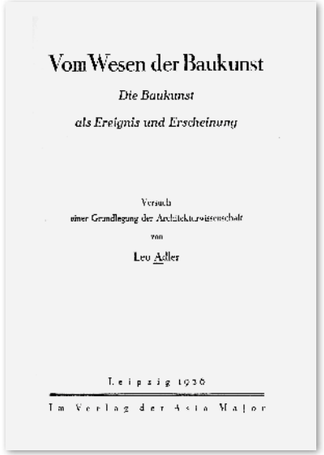
19 Hediger, Heini: Vom Zwinger zum Territorium. In: Kirchshofer, Rosl (Ed.): Zoologische Gärten der Welt. Die Welt des Zoo, Innsbruck 1966, p. 13.

20 Schmarsow, August: Das Wesen der architektonischen Schöpfung, Leipzig 1894.

21 Cf.: Schoper, Tom: Zur Identität von Architektur: Vier zentrale Konzeptionen architektonischer Gestaltung, Bielefeld 2010.

22 In the further course of this work, the use of architecture-specific terminology in the title Grundriß der Allgemeinen Zoologie (Leipzig 1922) will be discussed. Alfred Kühn's role in the period between 1933 and 1945 is not considered, nor is his work Grundriß der Verberbungslehre (Leipzig 1939).

23 Kühn, Alfred: Grundriß der Allgemeinen Zoologie. Leipzig 1922, p. 5.



Architectural theoretic approach to terms also used in zoology
Adler, Leo: Vom Wesen der Baukunst. Die Baukunst als Ereignis und Erscheinung, Leipzig 1926

Leaning on the vocabulary of architecture: textbook for zoologists
Kühn, Alfred: Grundriss der Allgemeinen Zoologie, Leipzig 1931

Taken out of context, the reader would hardly conclude that it came from a zoologist. And the fact that the author employs architecture-specific terms in the text does not detract from this supposition. Put another way, Kühn identifies a terminological kinship between the two disciplines, which becomes clear in the conclusion of his first chapter.

»*The task of zoology is the description of the construction, the development of the animals, and their relations to the environment, the systematic ordering of the animal forms and their form kinship with each other and the representation of their sequence in geological history.*«[24]

By simply replacing the word ›animal‹ with ›style‹, this paragraph can serve as a definition of architecture theory. The task of architecture theory is the description of the construction, the development of the animals, and their relations to the environment, the systematic ordering of the style forms and their form kinship with each other and the representation of their sequence in geological history. Word plays involving the terms form, style, or floor plan will not lead to an architecture theory for zoo buildings. At best, such a theory can be sketched in half sentences. And because of space limitation, daily newspapers and professional magazines can only scratch the surface of the subject.

Direct public exposure to architecture in zoos occurs above all in the audio-visual media. The written word in the form of printed text, as the base for a current intellectual discussion of the subject, is restricted to a small circle of experts. The popularity of individual animal species can deflect the attention of a broader public to the architecture. A building culture that does not yet exist would be appropriate for the standards of the zoological garden as a scientific facility. In point of fact, all the important building typologies of relevance in the West have a theoretical foundation.

The architects themselves ensure that it is so. It is striking that the architects of theatres, museums, or stadiums see to it that in addition to the play programmes or exhibitions in these cultural institutions, the architecture itself plays a leading public role in the transmission of culture. That standard has yet to be formulated for zoo architecture. On the basis of the great competitive pressure in a small world the public relations departments of the firms that might otherwise address this task, pass over the usual need to inform the fraternity of architects. But the impression is misleading. Buildings for animals are high security structures with the corresponding secrecy needs. Perhaps this requirement could be a reason for which this building type is hardly mentioned by architects in the expert literature, and the subject of building for animals seems to be reduced to zoo architecture.[25]

In fact, the discussion of the building task is much broader and more differentiated. On the one hand, perhaps the use of shared zoology and architecture terminologies might lead to a situation where building for animals could help determine a site location for humans in the context of the fauna. Because »the design of a zoo is always an indication on the status of the relationship between man and animal«[26]. On the other hand, the reflection about zoology may give the architecture discussion a new impulse in which Semper's idea of an evolution of form provides an orientation in the haphazard confusion of superficial knowledge and private theories propounded by commercially motivated architects.

Architecture can not be reinvented. Architecture, like nature, gets along quite well with a few basic forms that creativity can then infinitely vary. If this research work on the relationship of architecture and zoology, of building culture and nature succeeds in laying a building block for an architectural debate about contemporary building, that is appropriate for animals, then another significant milestone will have been passed.

24 Ibid., p. 6.

25 See: Meuser, Natascha: Zwischen Bühnenbild und Gefängnisbau. Vom Fehlen einer Debatte über zeitgenössische Zoobauten – eine Skizze, in: Modulør, issue 2/2013, p. 22 onwards.

26 Kurt Brägger cited in: Blaser, Werner: Kurt Brägger, Zoo Basel 1953–88.

Design Parameters

The Foundations of the Design
Ten Parameters for Pandas

Natascha Meuser

Formulating design parameters for zoo buildings is a challenge at first because as long as a purely building typological investigation has not been made there is no reference point for the architectural foundation for such a building. What are the outlines of the generally valid aspects for a design? Although this ten-part list by no means claims to be complete, by observation of these parameters the design and planning of a zoo building can be carried out.

1 **Discovering a new world**
The regions the animals come from

2 **Urban integration**
The particular urban context of the zoo

3 **Building form**
How the architecture is presented

4 **Paths and signposting**
How visitors are conducted through the building

5 **Spatial barriers**
How to shape fences, trenches, and display windows

6 **Safety management**
How human beings and animals can be mutually protected

7 **Displaying the animal**
How the animal can be attractively presented

8 **Signage and didactics**
How information reaches intended recipients

9 **Design**
What the selection of material, colour, and light can do for design

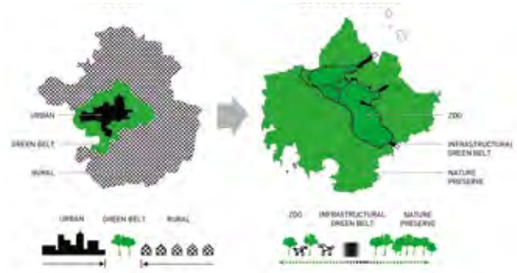
10 **Architecture and brand development**
How striking buildings create advertising for the zoo

Discovering a New World
The regions the animals come from

1

Natascha Meuser

Beginning with the first design sketches, the question of who the occupants are – who will move into the animal building – must be answered. In the recent past, a trend in zoos has emerged to build theme parks in which the fauna of larger regions, like the ice deserts of the Arctic or Antarctic, tropical regions, or the African savannah are presented. A general trend »from animal house to theme park« can be discerned. This increase in the content complexity exerts an influence on the architecture as well as the museum support programme housed in the building. In Anglo-Saxon countries, one speaks logically enough of animal collections, a terminology that is also used in museums. To begin with, the staging for the dramaturgy of buildings and fauna means that the ›museum collection‹ must be assembled by a curator and a zoologist. The composition of different habitats under one roof, which in nature are geographically disparate or at best adjacent to each other. With this environmental gesture in mind continents can be presented as »one world«.



The zoo for a better South Korea: Dochodo Zoological Island – Empowering the Infrastructural Green Belt
JDS Architects

Competition design for the aquarium in Batumi, Georgia: House of the Four Seasons
Henning Larsen Architects

Urban Integration
The particular urban context of the zoo

2

Two opposing aspects emerge in the urban context: on the one hand, the institution of the zoological garden is dependent on an inner city or a proximate urban location in order to guarantee accessibility for visitors. On the other hand, a densely settled urban location may influence the behaviour of the animals and limit the zoo's expansion possibilities. Three categories that characterise the urban context are:
(1) the suburban location in the vicinity of other significant urban facilities. For instance the Wrocław Zoo is next door to the famous Max Berg Century Hall, opened in 1913 as an exhibition and fair facility, and still in use for large-scale events today. As a consequence, there are enough parking opportunities nearby.
(2) Location in the middle of a zoo/inner city zoo. like in London, Paris, Vienna or Berlin. Although they are lacking space for expansion, they are convenient to reach by highway or a main rail and are a welcome local recreation area for visitors fleeing big city stress.
(3) Surrounding countryside. A lack of space is not an issue in the surrounding countryside. For example, the Helsinki facility is located on an island on the coast of the Gulf of Finland. And in Tbilisi a new zoo was planned to be built in 2012, on an artificial reservoir on the outskirts of the city.
The educational aspect is an argument for keeping zoos active in cities. »If we're going to have any chance as a society to teach the public about climate change and the environmental crisis, zoos are going to be a place where it happens, in part because they attract so many people, but also such a wide variety: religious, secular, Democrat, Republican—everyone visits the zoo.« (David Grazian)

Helsinki Zoo: island paradise in the sea
Beckmann-N'Thépé Architects

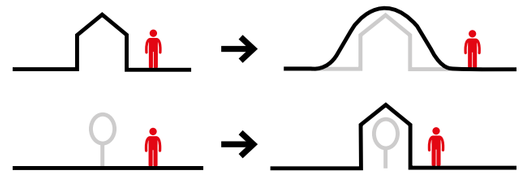
Berlin Zoo: inner-city tourist magnet with inter-city rail connection

Tbilisi Zoo: artificial world on an artificial lake
Proctor & Matthews

Building Form
How the architecture is presented

3

Whether consciously or not, before they create a design, all architects make a typological decision. This decision exerts the greatest influence on the building form. The architect strives to develop a coherent design, which corresponds to the user requirements of the building and which can be realised by a plan, governing costs and completion. According to in-depth studies of the more striking zoo buildings, four main building forms can be identified: the »decorated box« (Robert Venturi), nature imitation, »construction as art form« (Otto Wagner), and the stage set. There are other special forms that do not fall into either of these categories. In addition, architects will use separate elements of different building forms, making classification difficult. But by and large, these four main building types comprise the zoo buildings. The »decorated box« is perhaps the most familiar building form because it fulfils traditional architectural expectations. The many examples in the research work here show that they must by no means look boring. Nature imitation reflects the philosophy of depicting nature in the form of iconic architecture. Buildings have emerged with new designs and planning tools that before the application of digital aids were unthinkable. Organically shaped buildings resembling a nest or the belly of a whale are a popular demonstration to the visitor of the connection to nature. In a more subtle fashion the »construction as art form«, presents the support structure as a subject of design and thereby a building form. And for the stage set, the fourth category, the design most often places a geographical subject (the Arctic, the tropics, etc.) in the foreground, which is then realised in the architecture.



Building in the zoo: deciding whether to integrate architecture into landscape or landscape into architecture
Bjarke Ingels Group

Leopard enclosure in Arnheim (2002)
Officium, Design Engineering GmbH

Yukon Bay theme world in Hanover (2010)
danpearlman, Photo: Frank Roesner

Paths and Signposting
How visitors are conducted through the building

4

The path is the goal: as worn as this saying may seem – for buildings where the focus is the transfer of knowledge, entertainment, and visitor guidance – this solution is the basis of every concept. In addition to museum buildings or art galleries, this pertains to zoo buildings. In the case of zoological gardens, as a consequence of the high proportion of children amongst the visitors, a selection of different routing systems is available. Large distances between two enclosures or buildings can be psychologically shortened with a clever system of attractive passageways, bridges, and paths. The design of internal access ways is by far the most architecturally prominent element in a zoo building. The spatial characteristics can be typologically differentiated as »over«, »through«, and »underneath«. In contrast to a museum, where the architecture takes a »back seat« to the exhibit or at best supports the exhibit with its effect, routes in zoo buildings are very often themselves staged. The animal can't be everywhere and because of the size of the enclosures, the distances between them can hardly be shortened. It therefore stands to reason, that a bridge over water, like the one in the Arnheim Zoo (in the Jungle Hall) becomes an adventure playground. Or when a treetop path like the one in the Zurich Zoo (in the Rain Forest Hall) turns into a 7 metre-long spatial adventure, weaving over the ground, through the green foliage. The ground level accesses are no less spectacularly designed. In the Hanover Zoo, the visitors are led through an Indian palace, in Vienna the spiral-shaped path runs next to penguins and polar bears. All visitors vividly recall the passage through water conduits and burrows. This is where architecture and zoology fuse: human behaviour becomes an essential element.

Treetop walk in the Masoala Rainforest Hall (Zurich Zoo)
Vogt Landschaftsarchitekten AG

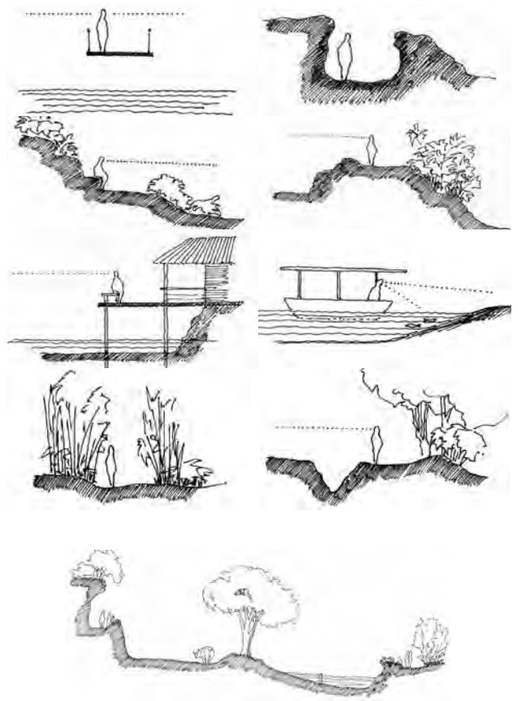
Walk-in water pipe in shark tank (Wrocław Zoo)
Adam Glonski

Balancing in the Jungle Hall (Arnheim Zoo)
Lucas Wahl

Spatial Barriers
How to shape fences, trenches, and display windows

5

The former use of cages and bars in zoos has been replaced today by a broad array of spatial barriers. That is partially due to a changed consciousness of the animals' needs as well as advances in structural engineering. Even if the common fence has not completely vanished from the zoo, the contemporary palette of technical possibilities offers architectural leeway. Since the days of Hagenbeck's enclosures without bars, when trenches as spatial barriers were introduced in zoo architecture, landscaping has become one of the important enclosure parameters. In addition to trenches, these include pools of water and the use of natural or artificially shaped hills on the grounds. Low impediments like these are needed simply to keep the visitors from getting too close to the animals. Fences are often replaced with thorny bushes. The technical advances of the glass industry, which can now produce impact and pressure resistant storey-high panes of glass, also contributed to the demise of cages with bars. Visitors can look a predatory cat in the eye at a distance of a few centimetres or count the bubbles in the fur of diving polar bears. But even the modern zoo can not do without heavy fence constructions. Simply on account of their weight, the pachyderms (elephants, rhinoceroses, or hippopotamuses) represent such a special problem that steel posts must be anchored to a depth below the earth that is equal to their height above the earth. Sheer mass is the best protection. In the case of climbing or jumping animals, fence dimensions correspond to the animal's anatomy and physical capacities. If a fence can be dispensed with, then as with all other spatial barriers, the alternative must be incorporated into the design and simply ordered from a specialised catalogue.

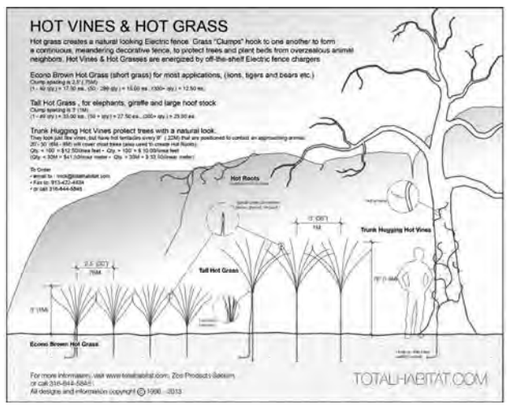


Selection of views in *Gondwanaland* in Zoo Leipzig
Illustrations: Ariane Röntz, Berlin

Safety Management
How human beings and animals can be mutually protected

6

Safety management is without a doubt one of the most complex tasks of a zoo. It starts with the usual building code requirements (fire prevention, for example), extending to special regulations (like occupational safety), to evacuation and escape concepts for the entire facility (such as disaster control). This section will deal with a single aspect of this subject: physical security in facilities for pachyderms. The primary concern is to protect the human being from the animal, but also to protect the animals from themselves and each other. In addition, there is the fact that because of their sheer size and weight, pachyderms can only be moved on their own or with the aid of a crane. In the internal areas of the enclosures that are not open to the public, an important aspect in safety planning must include amongst others, the capability to separate one elephant from the herd. This can be done with locks whose gates can be moved vertically or horizontally. The doors and gates for zoo personnel must be designed in such a way that they cannot be squeezed shut by the animal by mistake. Since these steel installations require optimal anchoring in the ground and walls, they are one of the most significant design elements of the overall plan, for outdoors and indoors. As a rule, the material used is stainless or galvanised steel without sharp edges in order to reduce maintenance and danger caused by injury. The protection is designed for animals and humans alike. Barriers for the visitors areas in elephant facilities are often formed by trenches or pools of water with steep walls. In only a few instances are additional electrified wires used, either for building code reasons or to protect the elephants from their own curiosity or clumsiness.



Hot Grass and Hot Vines are used by zoos worldwide to protect their valuable trees and landscaping from animal destruction, while virtually disappearing within the naturalistic environment. These electrified elements are designed to quickly train animals of all sizes by delivering a decisive yet harmless shock.
www.totalhabitat.com

Displaying the Animal
How the animal can be attractively presented

7

The architect, landscape architect, and zoologist are especially called on in presenting the animal. This is where the visitors' expectations – to be able to optimally observe the animal – must be fulfilled. By the same token, the animals must not be disturbed in their daily routine. Active zones and rest areas for human beings and animals must be coordinated with each other. While the animals have hardly any opportunity to escape the gaze of the visitors in a traditional zoo enclosure (cages or indoor enclosures), the outdoor territory provides a modicum of freedom and a certain autonomy. However, the visitor must be given the opportunity to go on the hunt and to ›lie in wait‹. Architecture can serve to enhance this enjoyment of nature, from vantage points; from above, a level perspective, or below. The view from above for the giraffe enclosures has become established. Being able to look the animals in the eyes has become standard operating procedure, and in some zoos, feeding the animals with fresh leaves and twigs is allowed. By means of a hole in the floor of a bridge over a pool of water can also provide a different view of the animal. Architecturally staged ground level views can be created if the gaze can be diverted with the aid of a display window, or when an unexpectedly transparent distance between animals and humans is created, with floor depth full glazing. The presentation of the animal also depends on the layout of the path (see 4 – Paths and Signposting), for example when at the end of a crawl way, a glass dome rises in the middle of an enclosure, visitors are given a view of a meerkat, which they will not soon forget or special staging by having the squirrel monkeys crawl through see-through tubes made of chrome steel netting.

Mesh tubes made of chrome steel as visitor attraction and photo motive: squirrel monkeys in the Knies Kinderzoo, Rapperswil
Müller & Truniger Architekten, Photo: Jakob AG

Increase in attractivity for the zoo of the future: human and animal are directly opposite
Bjarke Ingels Group

Signage and Didactics
How information reaches intended recipients

8

A good control system comes with few or even no signs. In the latter, the architecture must speak very graphically for itself, as in the Hanover Zoo, where ›narrative‹ buildings take over part of the orientation and information: West African round huts, a Canadian port facility, or an Indian palace are representative of the fauna in the tropical savanna, in the Arctic, and in South Asia. Of course, the forest can not be felled in all zoological gardens. The realisation that signage – the conception and design of guidance and orientation systems – is an independent design task, is increasingly gaining acceptance with zoo administrations. For the designing architect, this means involving a specialist at an early stage. Important in the conception and design is the sequence of departure, guidance, and destination points, which are in the complex development system of a zoological garden. Signage should, if possible, be consistent with the didactic concept and branding (see 10 – Architecture and brand development) of the zoo itself. This offers the opportunity to develop a barrier-free visitor guidance system and a modern didactic method aimed at a public effective overall concept. In a further step, the different information media can be defined editorially and creatively. It is advisable not to forego analogue information, as digital media must be maintained and updated constantly. In addition to the conventional information panel on the origin and characteristics of each species, didactic display boards are very popular (for example for identifying the different types of zebras or giraffes). However, the principle applies to both didactics and signage: less is more!

Interactive zebra identification information board (Zoo Osnabrück)
Lechner Design

Design
What the selection of material, colour, and light can do for design

9

Even in their chosen discipline, architects have no claim to design freedom. An architect designs a zoo building not just for humans. What is pleasant for a visitor may be very harmful for an animal. That starts with colours that may be threatening for animals, or lighting that could impair their vision, or materials that stimulate appetite instead of creating harmony. For example in the elephant facility in Erfurt, eighteen different floor coverings are used in order to give the sensitive pressure receptors in the animals' feet some variation. Some trends can be observed in newer zoo buildings: in addition to descriptive imitation of habitats, there are often spatial sequences with surprise effects. For instance, a section of the outside wall of the elephant facility in the Cologne Zoo was finished with precast concrete parts, with an elephant skin texture and look. In Singapore, a polished floor that depicts the surface of jungle waters greets the visitors in one of the rooms of the River Safari facility. And the architects of the gorilla facility in the London Zoo were inspired by the ornamental shield of a Central African tribe, which they used as a pattern for the wood panelling. Boltshauser Architekten designed theatrical spaces consisting of circular windows beneath an illuminated fish pool for the Ozeanium in Basel while for the Masoala Hall in Zurich, Gautschi Storrer Architekten created terrariums with a painting-like effect on the wall. Drei Architekten proposed a surprise for the aquarium in Batumi: a primitive circular village plays with changing light by day and night, so that the building on the bank of the lake acquires a mysterious appearance.

Hologram room
Design: Anotidaishe Mavazhe

Architecture and Brand Development

How striking buildings create advertising for the zoo

10

The list of design parameters for zoo buildings would be incomplete without addressing the architecture as a point of identification. The idea that striking buildings contribute to the image of a zoo may seem far-fetched at first. But a closer look will show that big city zoos successfully use architecture for their public image. Instead of an image of their buildings in their logo, the Bronx Zoo depicts a high-rise silhouette between the legs of two giraffes. And for a series of posters for the reopening in 2014, the Parc Zoologique de Paris used internationally recognised buildings from Paris. Architecture is also used in miniature format for identifying wildlife parks and zoos; for example the official postage stamps that show zoo buildings, of course with animals as poster boys. This practice underscores the value that outside parties attach to the zoo as an institution and its architectural impact. This is no surprise. In a time when almost all zoos feature the same stock of exotic animals, a lion or an elephant does not represent a unique selling point, as might have been the case one hundred years ago. Zoos are differentiated from each other by the programs they offer (events in the zoo), by the upgrading of park facilities (local recreation factor), or simply by the increase in attraction in the form of unusual buildings. Since the majority of planning contracts today are issued in public competitions, the increased quality of the buildings and the heightened public awareness of architecture also have an effect on the zoos. This new focus can only contribute greatly to their general benefit.

Art Nouveau Gate in the Hagenbeck Zoo (Hamburg) and Elephant Gate in Berlin: stamp block of the German Federal Post with the nominal values of 100 and 200 Pfennig from 1994

Panda Paradise in Everland resort, South Korea
»In the master plan we see visitors not as tourists but as explorers, giving them a variety of opportunities and sites to learn about the environmental challenges.«
Architecture: dan pearlman

Planning Fundamentals
Checklist

This checklist is a possible communication platform for architects, zoologists, and builders. It is composed of four columns: Territory, Workspace, Visitors' Space, and Buildings as well as three double lines: Space, Function, and Design. For every planning project, the checklist is to be adapted accordingly and supplemented if necessary.

	Territory		Workspace		Visitors' space		Buildings	
Space	Space requirements	Enclosure size	Access & emergency exits	Observation	Clear visibility	Visible / invisible delim-itations	Space programme	Façades & walls
	Retreats	Refuge areas	Passive/active food distribution	Isolation & quarantine	Pathways	Toilets & rest areas	Ceilings & roof	Floors
Function	Feeding ground	Scratching posts & wallows	Cleaning	Maintenance	Age adapted	Accessibility	Renewable energies	Heating & cooling
	Breeding grounds	Faeces post	Water / electricity	Security	Safety instructions	Information transmission	Fresh air & air circulation	Rainwater & snow
Design	Surface quality	UV light & shade	Signage & work regulations	Orientation	Nature within the enclo-sure	Signage	Building typology	Preservation order
	Vegetation	Bodies of water	Recreation room	Lighting	Enclosure attractiveness	Animatronics	Materials & colours	Lighting

A zookeeper brings bamboo into the Giant Panda's enclosure. Wolong Natu, China
Ami Vitale / Alamy Stock Foto

Planning Fundamentals
Giant Pandas (Ailuropoda melanoleuca)

Dimensional principals and proportions

	Biological Systematics
Kingdom	Animalia
Phylum	Chordata
Class	Mammalia
Order	Ursidae
Scientific Name	Ailuropoda melanoleuca
Common Name	Giant Panda, Giant Panda Bear
Other Name(s)	Giant Bear Cat, Bamboo Bear
Group	Mammal
Number of Species	1
Location	Mountains of central China
Habitat	High-altitude, moist bamboo forest
Colour	Black, White, Brown
Skin Type	Fur
Size	1.5m - 1.8m (4.9ft - 6ft), height ca. 0.75m
Weight	110kg - 250kg (242lbs - 551lbs)
Top Speed	32kph (20mph)
Diet	Omnivore
Prey	Bamboo, Fruits, Rodents
Predators	Humans, Leopards, Birds of Prey
Lifestyle	Diurnal/Nocturnal
Group Behaviour	Solitary
Lifespan	20–35 years
Age Of Sexual Maturity	4–8 years
Gestation Period	5 months
Average Litter Size	1
Name Of Young	Cub
Age Of Weaning	12–15 months
Conservation Status	Vulnerable
Estimated Population Size	2,000
Biggest Threat	Habitat loss
Most Distinctive Feature	Extension of wrist bone acts as a thumb

Native Habitat
Giant pandas live in a few mountain ranges in south central China – in Sichuan, Shaanxi and Gansu provinces. They once lived in lowland areas, but farming, forest clearing and other development now restrict giant pandas to the mountains. Giant pandas live in broadleaf and coniferous forests with a dense understory of bamboo, at elevations between 5,000 and 10,000 feet. Torrential rain and dense mist descend throughout the year on these forests, which are thus often shrouded in heavy clouds.[1]

BASICS
Gutachten über Mindestanforderungen an die Haltung von Säugetieren: Bundesministerium für Ernährung und Landwirtschaft. 7. Mai 2014 (Auszug)
Opinion on minimum standards for the keeping of mammals: Federal Ministry of Food and Agriculture. May 7, 2014 (excerpt)

Bears (Ursidae) including Giant Panda (Ailuropoda)
There are 5 genera with 8 species, which are all predominantly diurnal and solitary in the wild. Polar bears are inhabitants of the treeless tundra. Adult brown bears only climb trees in an emergency, the other species are more or less pronouncedly tree-living. All species are represented in German zoos.

1 https://nationalzoo.si.edu/animals/giant-panda (accessed 20 January 2020).

newborn 2 weeks three weeks – two months three months –five months six months – two years

Enclosure requirements
All enclosures must be easily subdivisible (e.g. with electric fences) or have partitioning enclosures. Enclosures or partitioning enclosures must meet the minimum requirements set out below.

Space requirements
The following dimensions apply to enclosures with paved, drained or otherwise treated floors, where the paved floors do not cover more than a quarter of the area. In enclosures with solid ground or extensive farming, the minimum area required is 1,000 sqm for up to 2–3 Malaysian bears and 1,500 sqm for up to 2–3 other bears.

Giant panda (Ailuropoda melanoleuca)
Outdoor enclosure: At least 200 sqm per animal. In case of pair management, 2 separate (if possible spatially separated) but connectable outdoor enclosures are necessary. Indoor enclosures: Connectable individual boxes of 8 sqm.

Enclosure equipment
For bears in outdoor enclosures, enclosure structuring in all three spatial dimensions is particularly important. It must be designed to allow the implementation of a systematic plan for habitat enrichment and employment of the animals from the outset. Climbing facilities with several entrances and exits as well as elevated resting places with sufficient distance for each animal must be provided. Screens, avoidance and retreat facilities, e.g. by means of rocks and thick tree trunks, must be provided and the animals must be able to retreat from the view of visitors. Shady and sunny places at a distance, which allow each individual to thermo-regulate through behaviour, are indispensable. Many opportunities for activity and a bathing area of at least 20 sqm (except for polar bears, see above) as well as areas with natural substrate (sand, bark mulch, applied, sown soil) with the possibility of digging are necessary. In indoor enclosures without underfloor heating, bedding is required in winter, for Malaysian bears in winter generally. Bedding is also required for nest-building. Hammocks or nest baskets with nesting material for nest building are to be provided for partly tree-living species. For breeding, quiet, darkened and dry litter boxes with self-watering facilities, which can be separated from other species and

Keepers in Zoo Adelaide, Australia (2009)
Photo: Peter Bennetts

Panda enclosure in San Diego Zoo, USA
Photo: Autumn Sky Photography / Alamy Stock

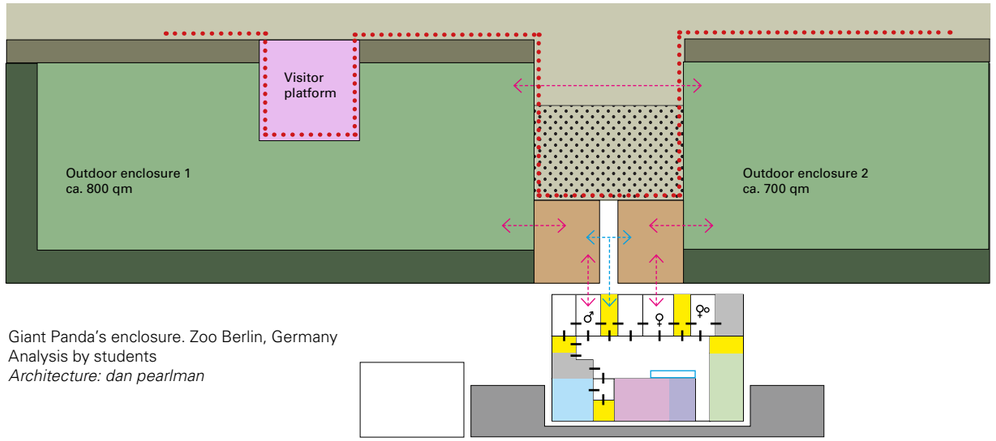
the keepers' working area, as well as access to a separate outdoor enclosure are essential. Enclosure boundaries: Dry or water ditches, walls, reinforced glass or grating with protection against climbing over and under.

Enclosure requirements
Social structure/society: Although all bears live solitary lives in the wild, they can be kept in pairs or small groups. However, it must always be possible to separate animals and keep them individually. The latter applies especially to the Giant Panda. Habitat enrichment: A systematic habitat enrichment plan for bears is needed for their employment and health care. There are detailed bear enrichment guides, including practical and varied sample calendars, toy-making guides and refurbishment examples. Enrichment objects, especially those with food, are to be offered in sufficient quantities, i.e. at least as many as the animals are kept together. There are numerous possibilities for habitat enrichment through tasks in feeding, which should be used variably. These include distributing portions of feed decentrally throughout the entire enclosure, presenting whole fruit and vegetables, offering feed in cardboard boxes or similar containers, feed tubes provided with holes or hidden in holes in trees or pieces of branches. Food containers should be placed in such a way that the bears have to stand upright. Smell stimuli are important, e.g. scent tracks should be placed to filled and unfilled food hiding places or scents should be applied to vertical surfaces. Constantly present but regularly changed nest material stimulates nesting behaviour.

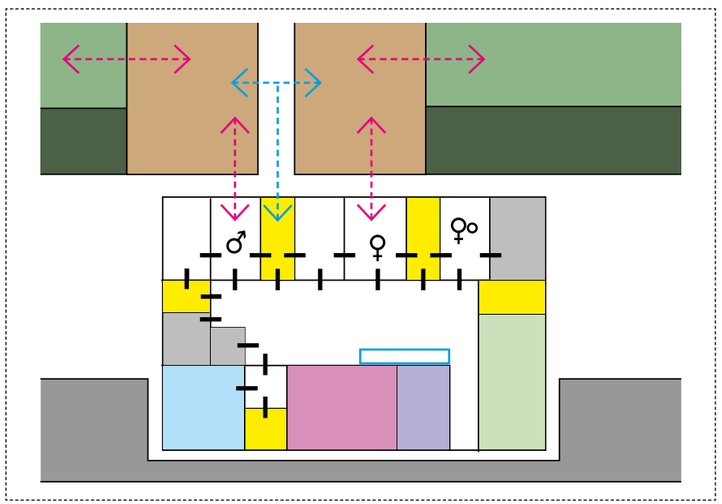
Animal stock management

Feeding/nutrition
Different types of bamboo are the basic food for the giant panda. Polar bears receive mainly fatty meat, preferably horse or beef, enriched with oil containing unsaturated fatty acids. The Giant Panda does not hibernate. It is the least seasonal in terms of food quantity. Since bears are opportunistic omnivores and are mainly engaged in foraging, the food should be distributed over at least 4 feedings per day, of which at least 2 should be decentralized by distributing the food throughout the entire outdoor enclosure.

Functional Diagram
Panda House, Zoo Berlin



Giant Panda's enclosure. Zoo Berlin, Germany
Analysis by students
Architecture: dan pearlman



Spatial Programs
Using the example of the
Panda House at Berlin Zoo

DIA / Masters Studio WS 2019/20

Building for Animals
New Construction of a Panda Enclosure

Spatial Programs

***External**	**approx. 2650m²**
Outdoor Enclosures for Males	1200 m² (without landscape)
Outdoor Enclosures for Females	1200 m² (without landscape)
Loading Bay	100 m²
Bamboo Storage Area (Waste)	150 m²
***Internal**	**approx. 1105m²**
Visitors' Area:	500 m² (total)
- Exhibition Area / Education Area	250 m²
- VR - Cinema / Hologram	100 m²
- Seating Area (View of Indoor Enclosure)	150 m²
Enclosure Building:	605 m² (total)
- Indoor Enclosure for Males	100 m²
- Indoor Enclosure for Females	100 m²
- Intermediate Space for Males (Ext. / Int.)	15 m²
- Intermediate Space for Females (Ext. / Int.)	15 m²
- Enclosure for Males (Zookeepers only)	20 m²
- Enclosure for Females (Zookeepers only)	20 m²
- Mother-Child Box	25 m²
- Training Cage for Males	15 m²
- Training Cage for Females	15 m²
- Corridor (with 2 Transport Boxes)	70 m²
- Veterinary Clinic	50 m²
- Nursing Area	40 m²
- Fodder Delivery Area	20 m²
- Zookeeper Lounge Area	15 m²
- Cold Storage for Bamboo / Fodder	50 m²
- Fodder Preparation Area	20 m²
- Technical Area	15 m²
*** Total Size of Enclosure**	**approx. 3775m²**

In the spatial program, moats / trenches are NOT INCLUDED in outdoor enclosures, paths leading around the outdoor enclosures and secondary buildings.

by Fred Richter, 10/2019

Giant Panda's enclosure. Zoo Berlin, Germany
Architecture: dan pearlman
Infographic: Christian Schlippes
Source: Berlin Zoo

PANDA MOONWALK or WHY MENG MENG WALKS BACKWARDS

Video Installation, Dur. 8:00 min, HD colour, sound
Bärenzwinger Berlin (2018)
Artist: Kerstin Honeit

Illustration: Natascha Meuser

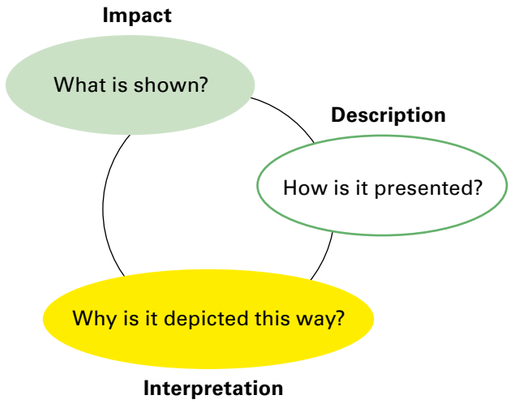
Photo: Natascha Meuser

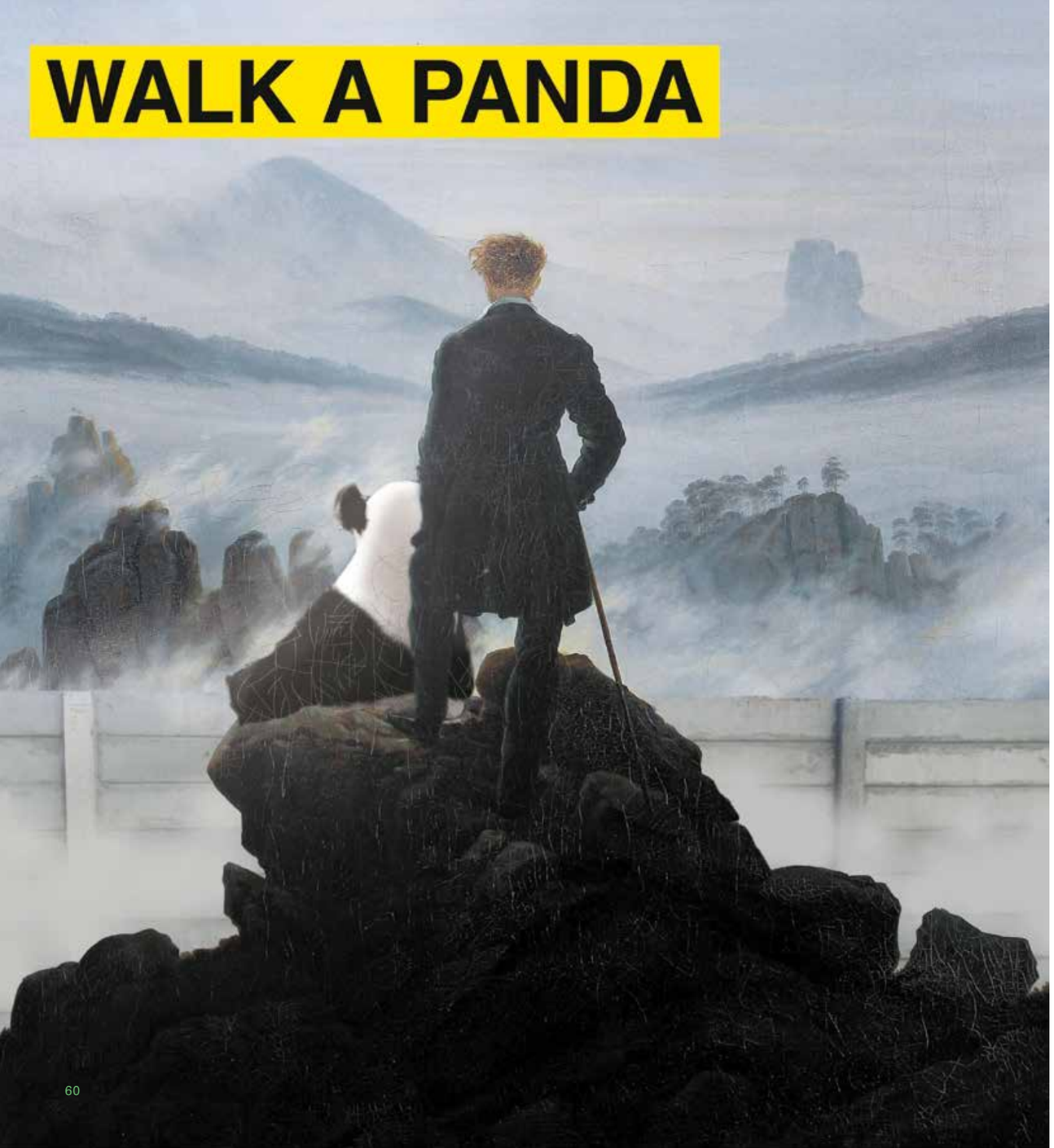
Photo: Natascha Meuser

Excercise 01
Image Analysis and Intervention Using the Example of Romanticism

Pick a painting from the Romantic period (from the 19th century, for example, Jakob Philipp Hackerts, Carl Gustav Carus, Caspar David Friedrich). Add space and volume in the form of architectural boundaries.

Nature is a dominant theme in paintings from the Romantic period. The Romantics sought to restore man's relationship with nature. They saw nature as something pure and uncorrupted and, therefore, almost spiritual. In this first exercise, the students were asked to take a new approach to nature. They picked a painting of their choice and explored and explained their personal views on nature by analysing the chosen artwork. The students then supplemented the paintings with built demarcations and add the image of a panda. This exercise was intended to make them aware that every human intervention produces effects and alienates the image of paradise. Basic ways of presenting nature and basic principles of perspective were discussed. Finally, the students developed a statement for the picture to represent an allegory or tell an anecdote which looks at the panda and explores themes, concepts, or gestures.





The Aesthetics of Perspective
View into nature

left:
Wanderer above the Sea of Fog (1817)
Caspar David Friedrich (1774–1840)
Kunsthalle Hamburg
Design: Eddie Goh

top to bottom:
Memory of a Wooded Island (1843)
Carl Gustav Carus (1789–1869)
Staatliche Kunstsammlungen Dresden
Design: Mohamed Shehata

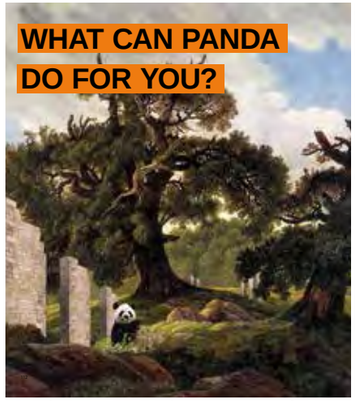
Rast am Brunnen in oberitalienischer Landschaft
Albert Emil Kirchner (1813–1885)
Private Collection
Design: Veronika Langen

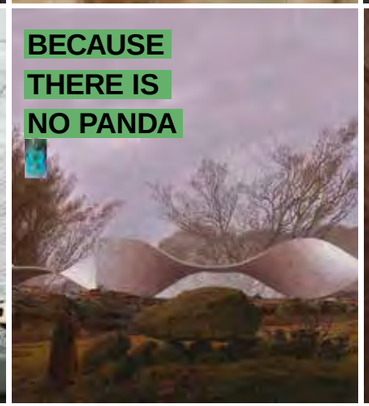
The Dort packet-boat from Rotterdam becalmed
Joseph Mallord William Turner (1818)
Yale Center for British Art, New Haven
Design: Anna Yan Thum

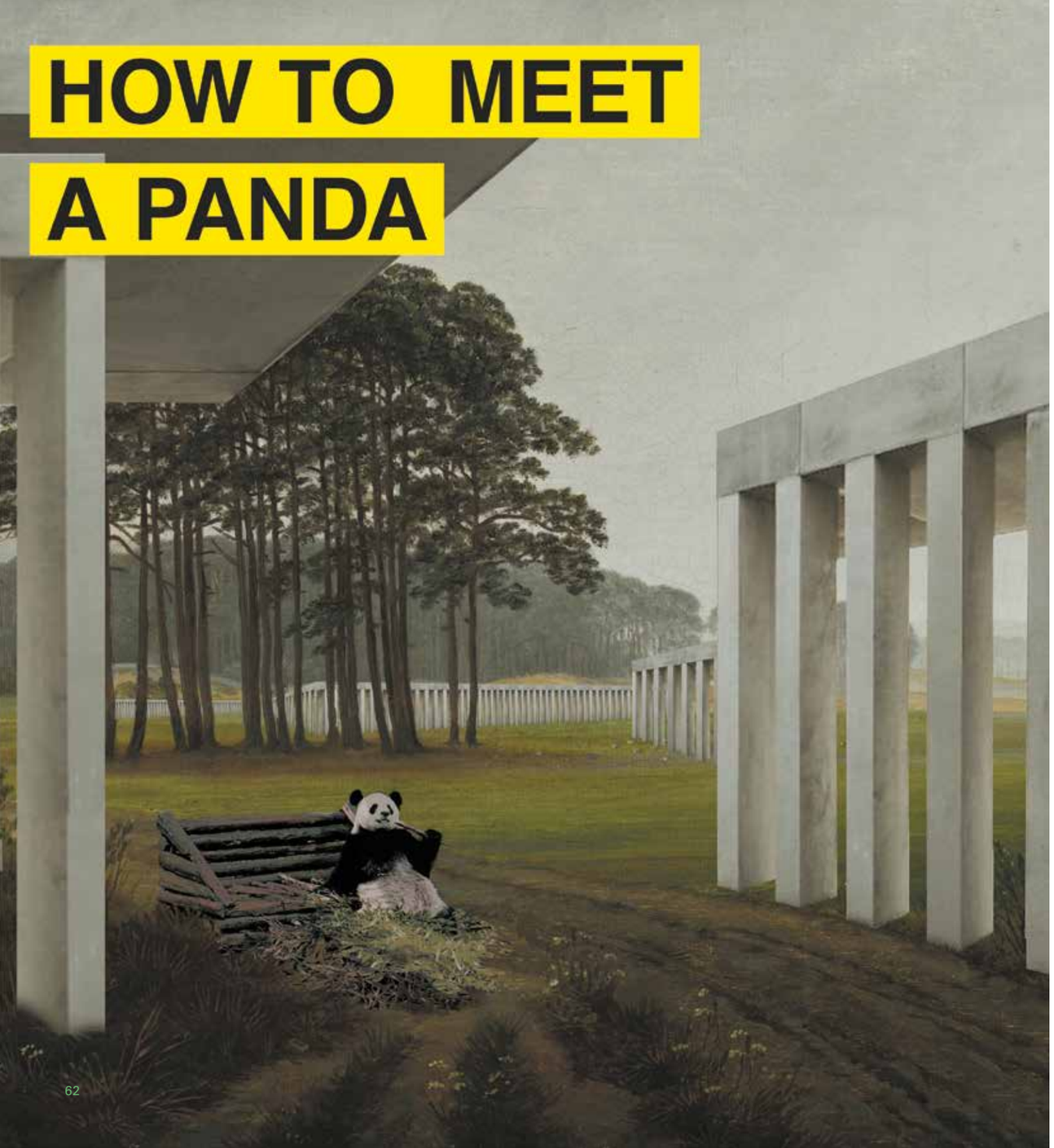
A Walk at Dusk (1830–1835)
Caspar David Friedrich (1774–1840)
Source: The J. Paul Getty Museum
Design: Jameel Trowers

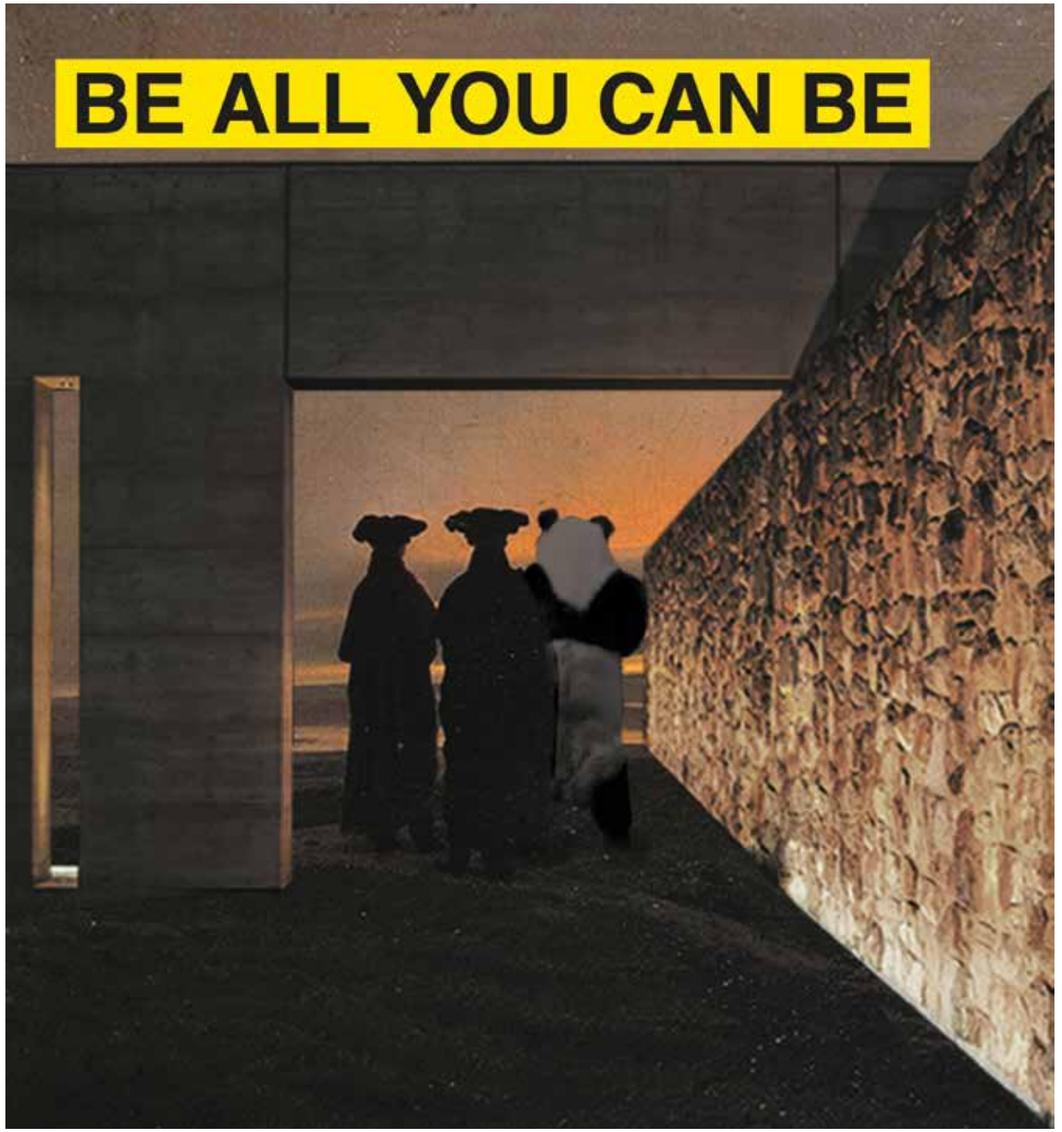
View of Lake Geneva (1849)
Alexandre Calame (1810–1864)
Source: Mussée National d'Histoire et d'Art, Luxemburg
Design: Martin Hundeshagen

Easter Morning (1835)
Caspar David Friedrich (1774–1840)
Museo Nacional Thyssen-Bornemisza, Madrid
Design: Anotidaishe Mavazhe









left: **The Times Of Day: The Midday (1821/22)**
Caspar David Friedrich (1774–1840)
Source: Lower Saxony State Museum
Design: Mehmet Caferoglu

Abendlandschaft mit zwei Männern (1830–1835)
Caspar David Friedrich (1774–1840)
Source: State Hermitage Museum, St. Petersburg
Design: Anotidaishe Mavazhe

Wanderer above the Sea of Fog (1817)
Caspar David Friedrich (1774–1840)
Source: Kunsthalle Hamburg
Design: Eddie Goh

Manifesto for Nature
Panda Claim

left:
View of Lake Geneva (1849)
Alexandre Calame (1810–1864)
Source: Mussée National d'Histoire et d'Art, Luxemburg
Design: Martin Hundeshagen

top to bottom:
The Cemetery Entrance (1824/26)
Caspar David Friedrich (1774–1840)
Source: Galerie Neue Meister, Staatliche Kunstsammlungen Dresden
Design: Manuela Grigorescu

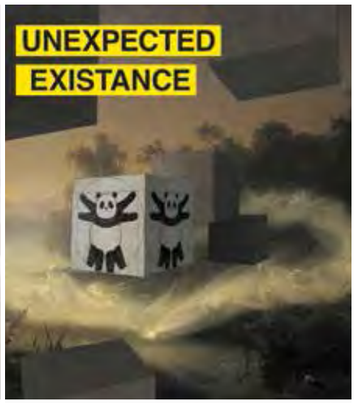
The Lonely Tree
Caspar David Friedrich (1822)
Source: Alte Nationalgalerie, Berlin
Design: Nurin Abdullah

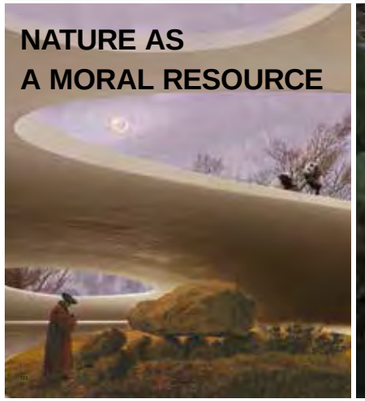
The Dort packet-boat from Rotterdam becalmed
Joseph Mallord William Turner (1818)
Source: Yale Center for British Art, New Haven
Design: Jameel Trowers

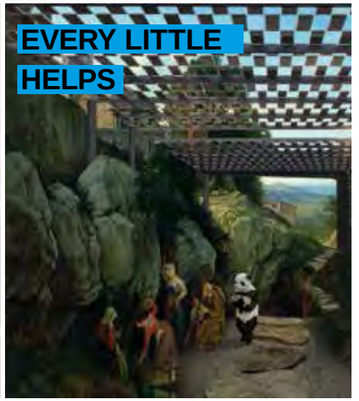
A Walk at Dusk (1830–1835)
Caspar David Friedrich (1774–1840)
Source: The J. Paul Getty Museum
Design: Jameel Trowers

Dancing Fairies (1866)
August Malmström (1829–1901)
Source: Swedish National Museum, Stockholm
Design: Saskia Misselwitz

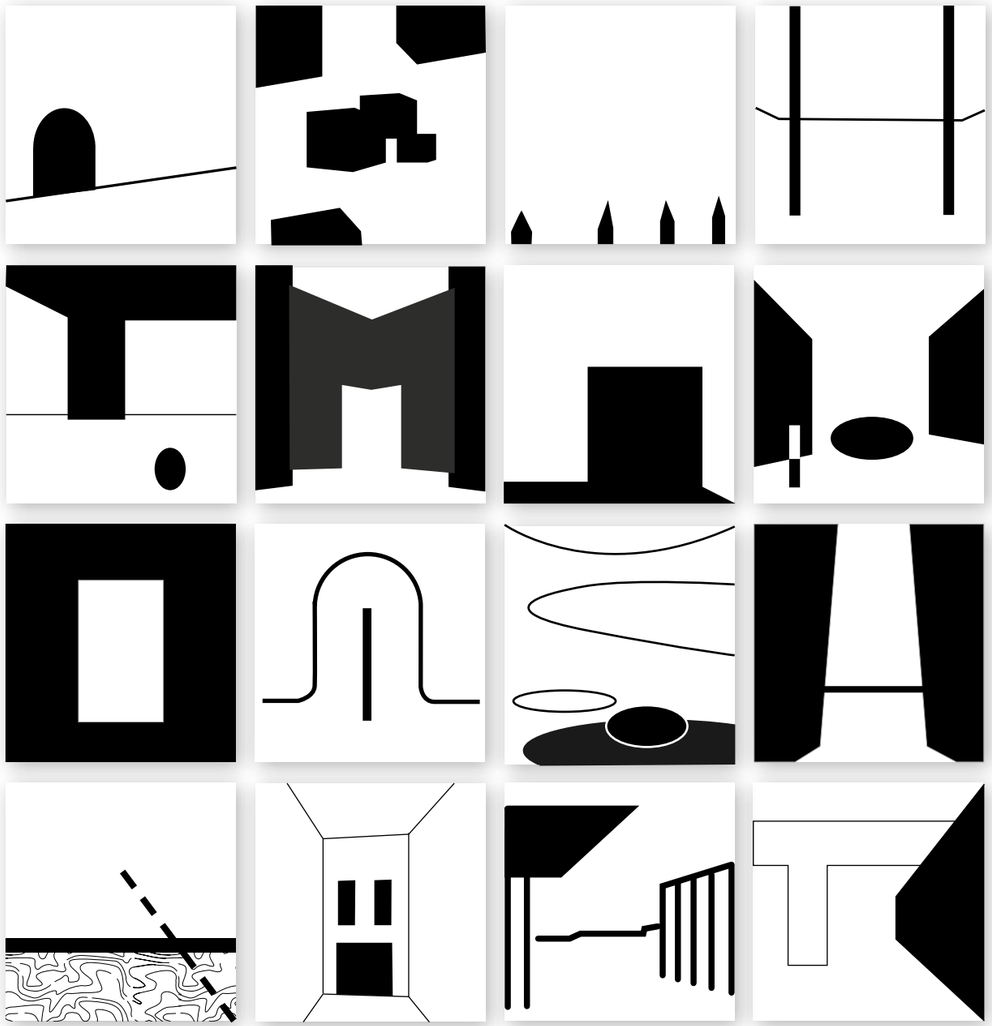
Ariccia/Morning (1828)
Adrian Ludwig Richter (1803–1884)
Source: Galerie Neue Meister im Albertinum, Staatliche Kunstsammlungen, Dresden
Design: Chin Ai Ong

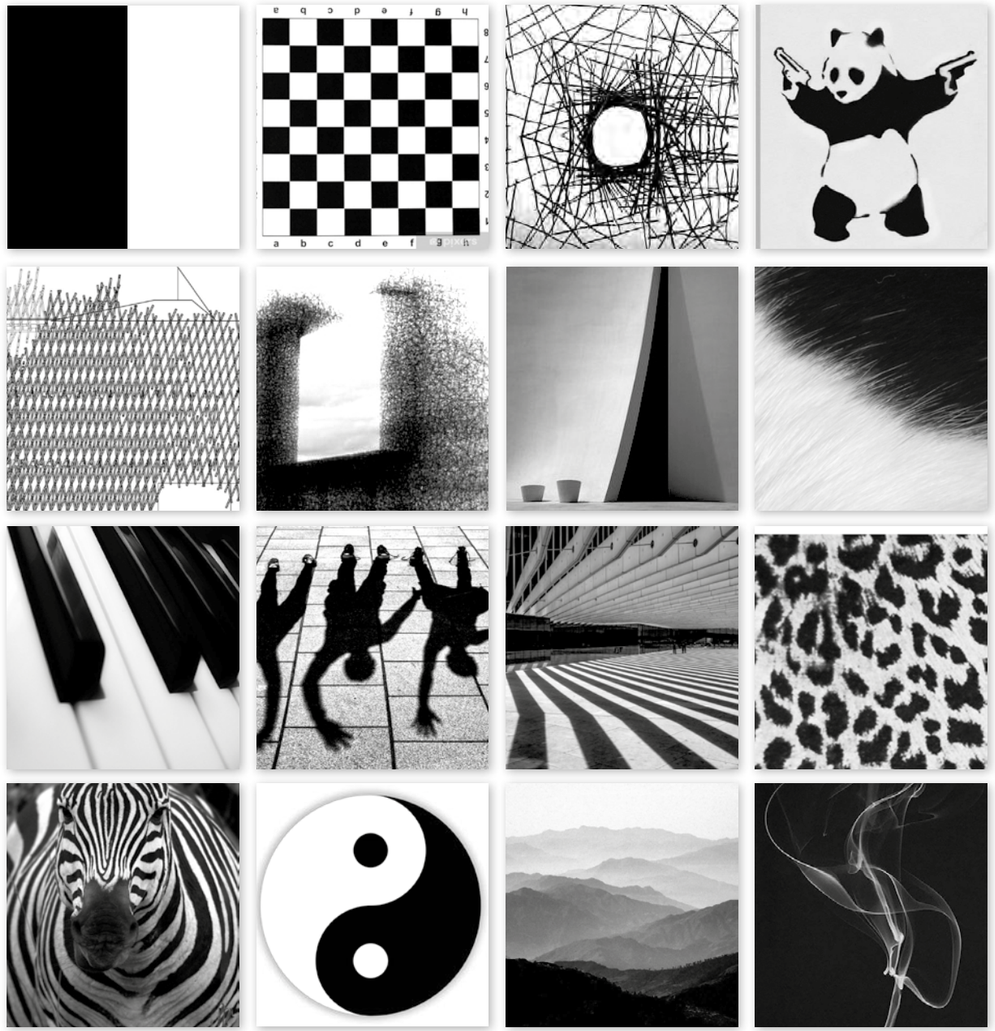






Black and White
Space, Volume and Contrast

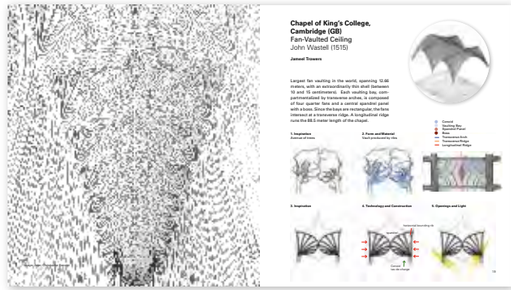
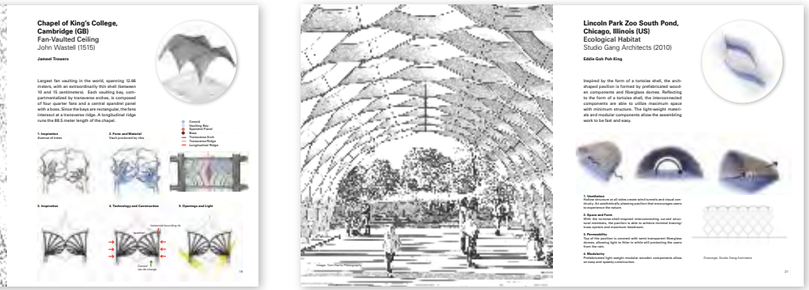
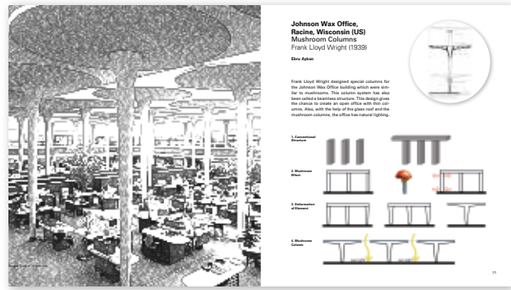
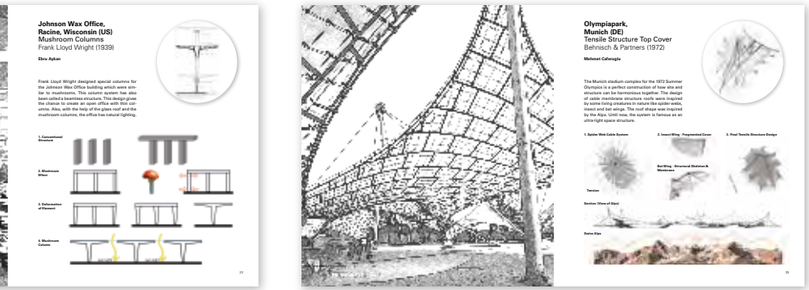
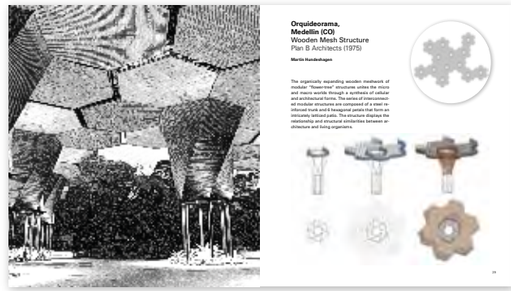
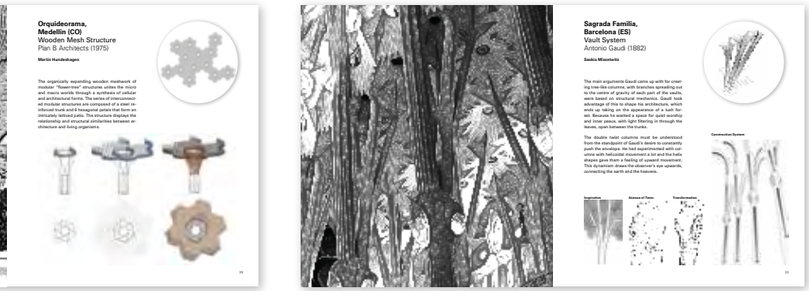


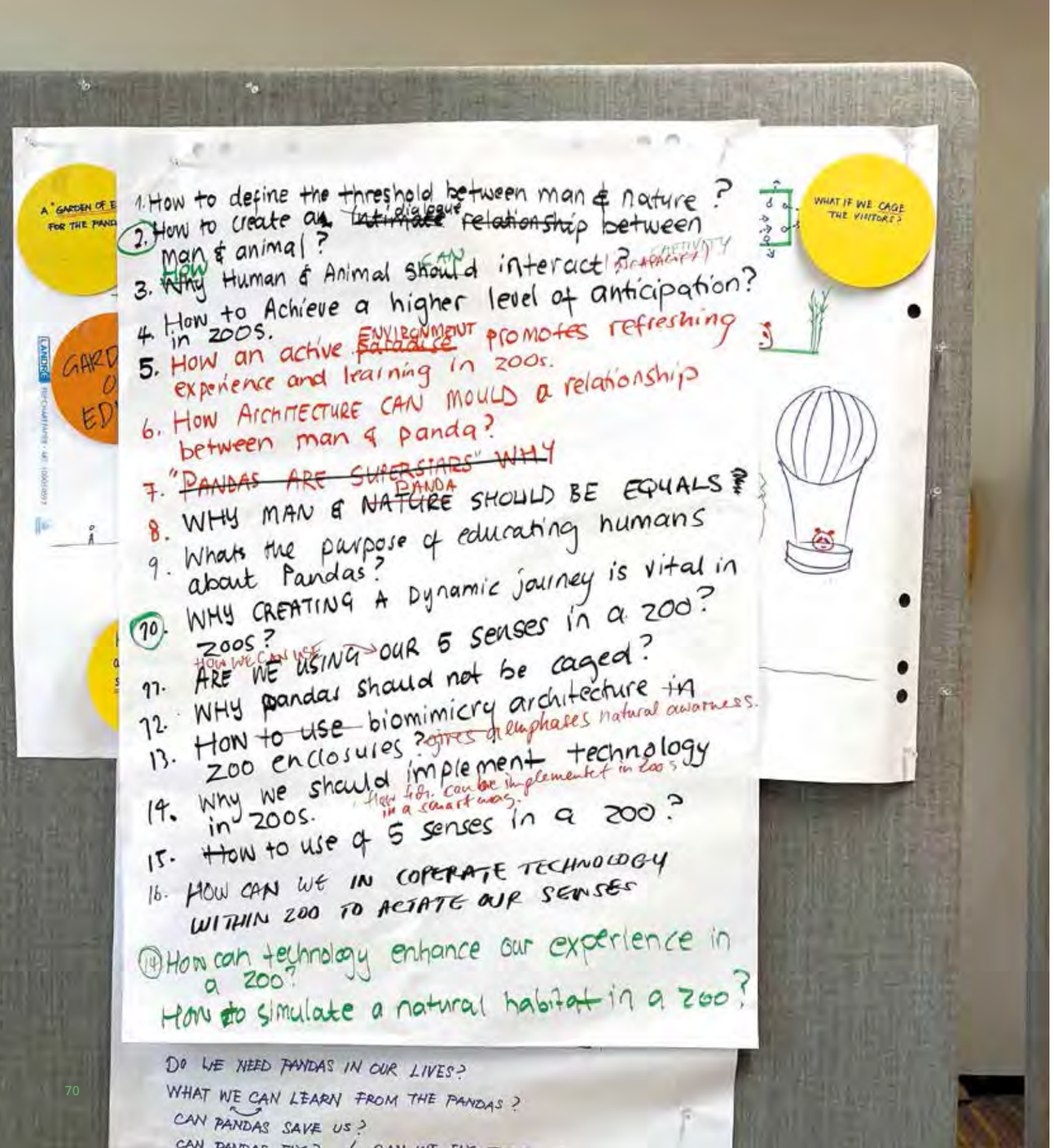


Phuktal Kloster. Zanskar. India
Pep Roig / Alamy Stock Foto

Excercise 02
The Aesthetics of Biology. Construction of Nature

Find a strong example from the history of building in which nature served as a model for new materials, constructions or forms. Draw architectural diagrams to explain the abstraction of general principles. Make use of natures solutions and develop them further. Each student presents an example of built architecture, that shows a strong relationship to nature.



Excercise 03

An Instruction to How to Write a Claim
What is your Message?

Based on your last presentation you must furnish proof of being able to address a task independently within a given timeframe and apply the results of your design thinking. Students are expected to demonstrate the capacity to depict the outcome of their academic research in oral form, as well as portraying and defending content methodically and convincingly within academic exchange. The following topics will require to be addressed:

Concept and Title
How should the work be titled?

Selection of Topic
What is the argument to be put forward? and/or defended?

Exposition
What is the motivation behind the work and why?

Key Visual
Pick a key visual that demonstrates your design idea!

Architectural Diagram
Sketch your main design idea to increase communication, and to provide vision and guidance.

Examples for Titles

From Breeding Station to Research Centre
Why Zoos Should Focuse on Research and Conservation

Free the Panda from Being a Rockstar
How the Focus can Shift Towards Education Rather than Entertainment

The Panda as Urban Showpiece
Why the Entrance to Zoos Should be Free of Charge

Watching and being Watched
How Viewing can Change the Perception
...

Projects

Noah's Ark

What if Noah's Ark Lends Meaning to a Potential Journey for Both Pandas and Humans?

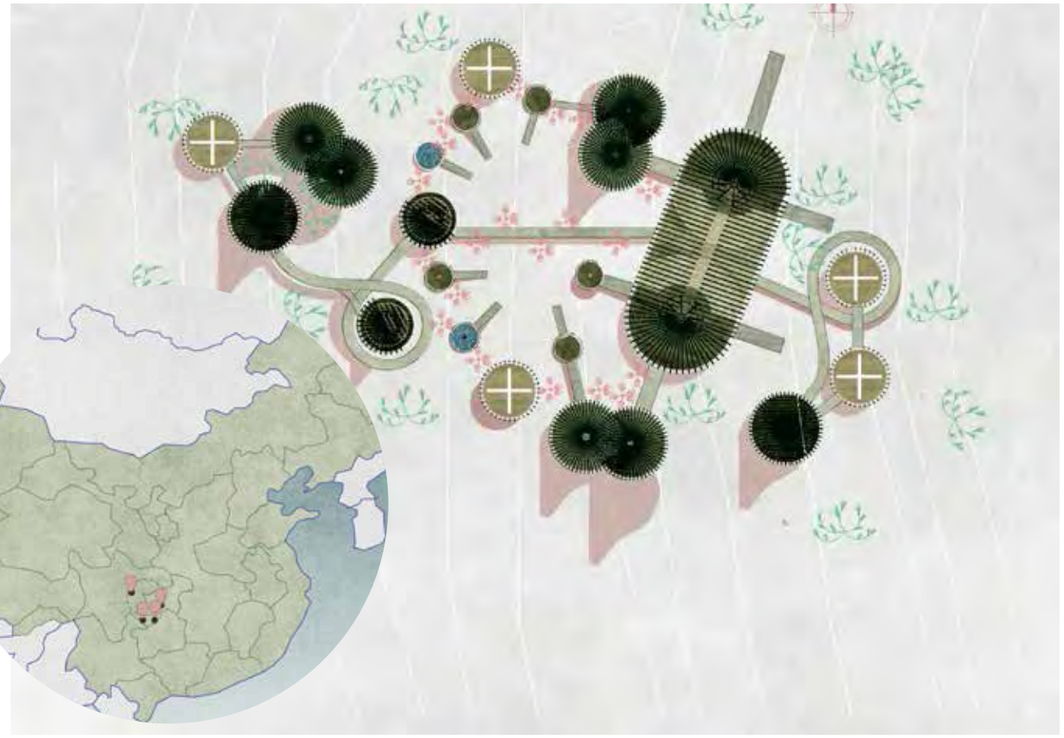
Nurin Abdullah

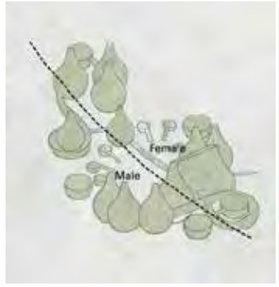
Personal Reflections
In future giant pandas could be left hungry and struggling to survive owing to insufficient food supplies – i.e. bamboo. The question is, how will there be any bamboo left for pandas when human developments are slowly wiping out most of the bamboo fields in the world? What can pandas do in response? Is it necessary for them to migrate? The hypothetical concept here is to create a journey emulating the migration of pandas from one place to another in order to look for their source of food. The structure is an attempt to symbolise the creation of Noah's Ark which is to protect pandas from harm or, in this case, starvation. Supporting this idea, plans for bamboo plantations in China are intensively underway which will play a significant role in solving this problem.

Mobilising the Habitat (A > B > C > D and repeat)
This proposal is an experimental suggestion. The objective is to provide a mobile structure that is periodically able to change the habitat without necessitating any natural demolition and is able to offer endless bamboo supplies for pandas. The structure will be situated for a maximum of three years at each location, allowing enough time for the bamboo on site to grow and mature for pandas to consume it. For ease of handling, parts of the structure can be assembled and dissembled.

Maximising the Habitat
Other than supplying pandas with bamboo, the aim is to give pandas more freedom to roam about within their natural and original habitat without any obstructive barriers or differences in temperature. This demands more space for them to interact with each other, with the ability to develop physically and cognitively.

Endless Movement and Multiple Experiences
This project represents an exploration for humans too who trace the experience of pandas on their migration journey in search of food. A long and endless trail begins with visitors' arrival on site on a hot air balloon. They then stroll around site without any end point or destination. The trail and materials create multiple interactions for both pandas and humans with flora and fauna at different latitudes.





Separation

The long trail is created with the help of subtle elements It creates a separation of the two genders.

Floating

Structures are located at different height and levels, mimic the site contours making them look as if its elevated and floating on the air.

Landscape as Structure

Using vegetation as part of the structure stimulates a sense of common homeland with the pandas.

Original Habitat:
Southern China

Site A
Qingchen Mountain,
Dujiangyan

Site B
Chongqing Huangshan,
Yangtze River

Site C
Chinshui Bamboo Forest Chinsui,
Zunyi

Site D
Shunan Bamboo Forest
Yibin, China

01 Landing Port (Visitors)
02 Landing Port (Staff)
03 Ticket and Souvenir Booth
04 Seating Area
05 Café
06 Indoor Enclosure (F)
07 Indoor Enclosure (M)
08 Veterinary Clinic
09 Training Cage/Nursing Area
10 Training Cage
11 Washroom
12 Changing Rooms/Rest Area
13 Playgrounds
14 Outdoor Enclosure (900sqm)

Multi-Purpose Structures

According to the animal needs and condition the multi-functional structures can be assemble or dissamble very easily.

Zootopia

Platforms are elevated on different levels and create the impression of a flowing structure, like floating in the air.

Circulation

A guided endless circulation, without having an ending point. The structure allows different places and views of nature.

Sections and Perspective

Landing Port
A landing space for the hot air balloons to land and this module act as the entrance/exit point to the visitors.
No. of Units: 1
Total area: 50sqm

Landing Port
A landing space for the hot air balllons to land. This module can only be used by staff for the ingress and egress of loading purposes.
No. of Units: 4
Total area: 50sqm

Ticket & Souvenir Booth
Function as a space for the staff to sell the zoo tickets and souvenirs for the visitors.
No. of Unit: 1
Total area: 70sqm

Seating Area
Semi-covered space for visitors to seat and »search« for the pandas which are roaming underneath of the structure. This module allows maximal viewing by showcasing the paranomic views.
No. of Units: 2
Total area: 50sqm

Café
Provide a tea-house cafe at the other end of the entrance. This module located at higher levels to allow the visitors to enjoy tea and scenery after they have experienced panda's migration journey.
No. of Units: 1
Total area: 35sqm

Pantry at Café
Function as a space for the staff to heat up tea or beverage, and desserts for the visitors migration journey.
No. of Units: 1
Total area: 35sqm

Indoor Enclosure
Consists of Indoor enclosure of both genders of the panda. Allowing the visitors to enjoy and observe both of the animal's behaviors
No. of Units: 2
Total area: 170sqm

Provide a sufficient necessity for the pandas

Training Cage/Nursing Area
No. of Units: 2
Total area: 50sqm

Veterinary Clinic
No. of Units: 2
Total area: 70sqm

Provide a sufficient necessity for both staff and visitors

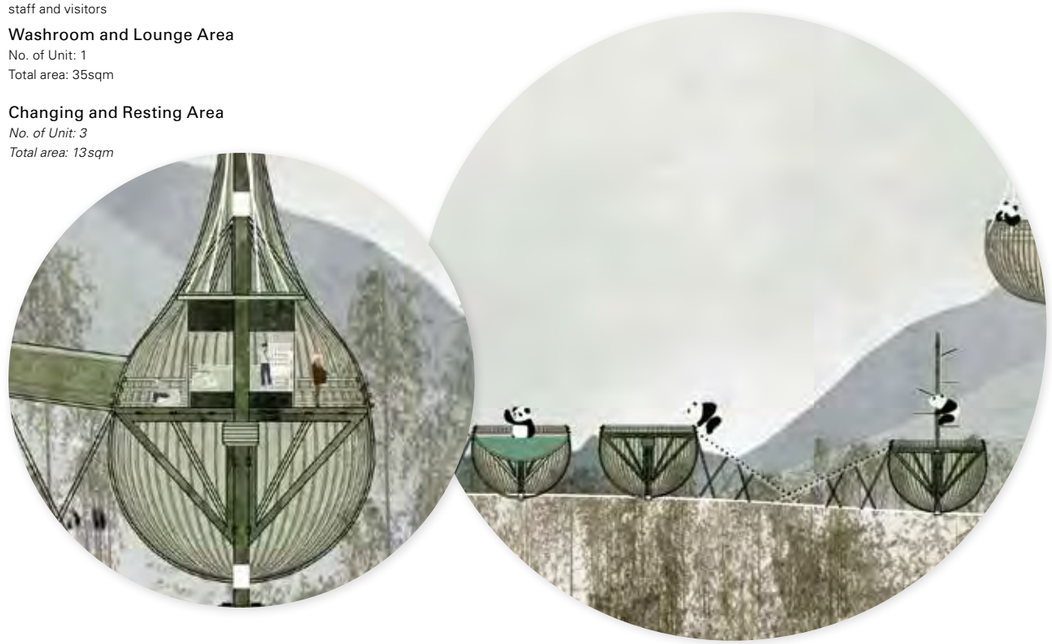
Washroom and Lounge Area
No. of Unit: 1
Total area: 35sqm

Changing and Resting Area
No. of Unit: 3
Total area: 13sqm

Playground: Feeding Stage
A landing space for the hot air balloons to land and this module act as the entrance/exit point to the visitors.
No. of Unit: 3
Total area: 13sqm

Playground Pool
For the pandas to have some fun with water, to swim or to drink. Water will be checked and filled regularly by staff.
No. of Unit: 2
Total area: 13sqm

Playground: Climbing
A solid climbing structure for the pandas to cling onto when they are at outdoor enclosure.
No. of Unit: 2
Total area: 13sqm



Modules

Instead of creating artificial worlds for pandas in zoological gardens, »Noah's Ark« constructs transportable shelters for the endangered animals, ones which can be easily found and visited by humans. The journey to the site is made by hot-air balloon, since there are no roads leading to the pandas' habitat and the mobile structures are to be set up at ever new places in the forest that have sufficient food resources. The experience will thus evoke associations with the exotic adventures such as those portrayed by Jules Verne. What remains is the shape of the hot-air balloon, which now no longer rises but, freed from its envelope, hangs down as a strutted structure like an oversized hanging chair and is attached to the existing wilderness. In these structures are not only the pandas, but also the people, so that both are equally shielded from a potentially hostile environment.
»In presence of Nature's grand convulsions, man is powerless.« *Jules Verne*

Vertical Zoo
How Verticality can Change the Zoo Experience

Shaun Yong

Vertical Architecture
Architecture has and always will be aimed at creating a design that favours its users. Each living being should have access to spaces which suit their nature and temperament. By focusing on vertical architectural elements, this project hopes to unveil the true nature of pandas – not the fat and lazy bears we have grown accustomed to, but rather playful and adaptable treeclimbers. To release all pandas back into the wild is and should always be an overarching goal. Hence, this enclosure serves to prepare pandas for the wilderness by honing their natural instincts and survival skills.

Form Derived from Nature
No amount of enclosed space is large enough for any enclosed living being besides the open world itself. For this project, however, the scale of architecture encapsulates nature dwarfing all living beings. Designed on top of a mountain in China, the concept behind the form is derived from nature itself: bamboo enwrapped by the mountain. The circulation route enables visitors to explore the entire scale of the architecture.

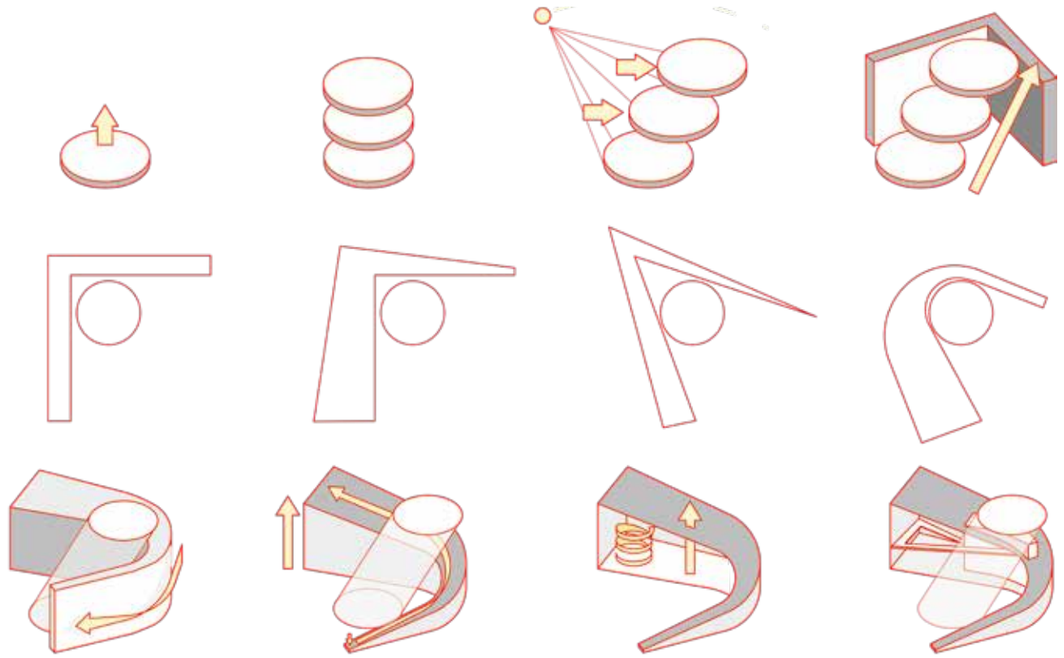
Side-by-side Circulation
The goal of this design is to create an enclosure for pandas to explore and to provide people with a better understanding of pandas. Each circulation route in the building brings people closer to this animal, rather than aspiring to be merely a touch-and-go event. As we venture through the building, we learn more about their nature, home, and surroundings, experiencing verticality alongside the pandas. Ultimately, it is important to bring together humankind and pandas since we, as humans, need to understand why these animals must be conserved and protected.

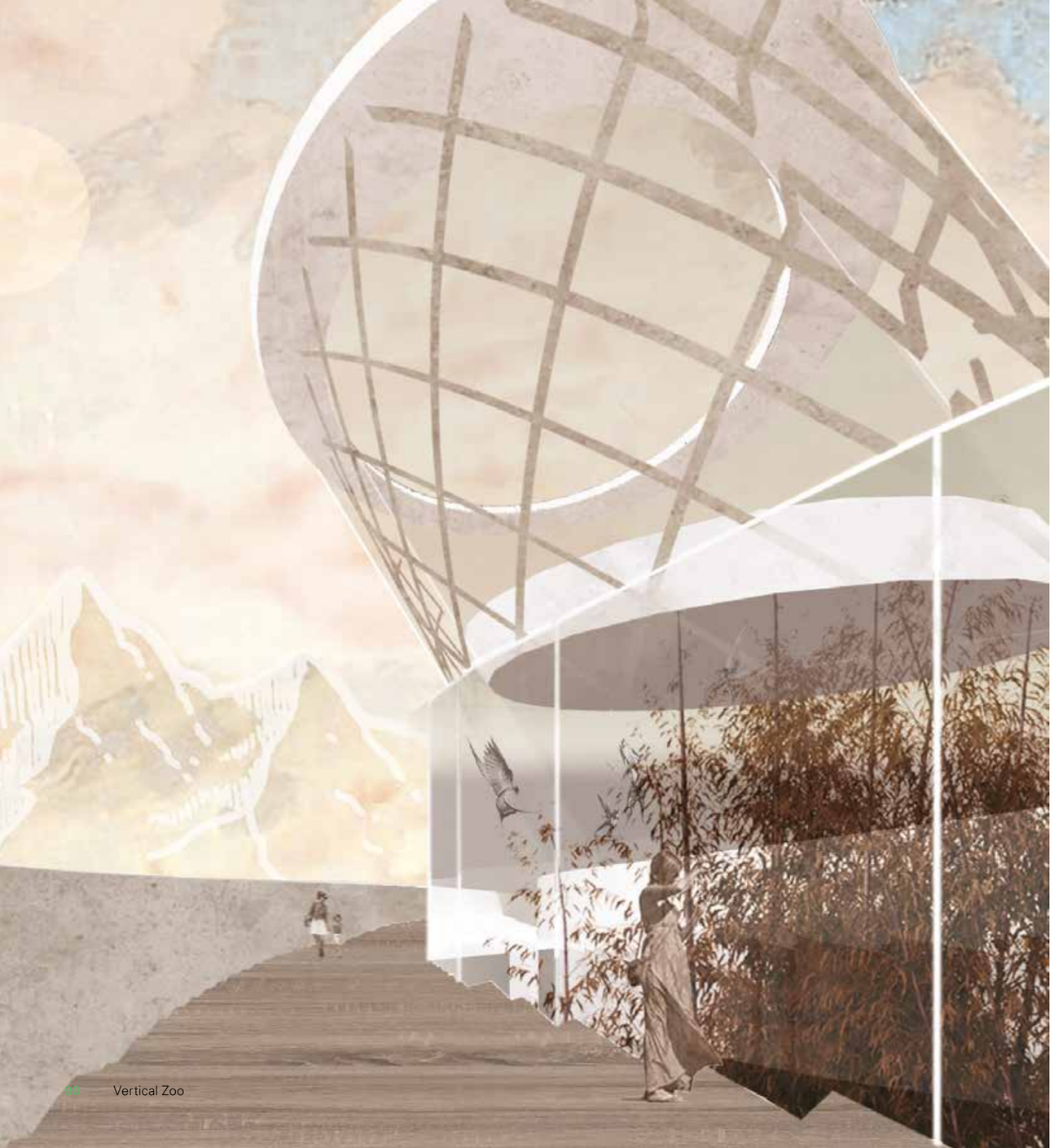
Design Idea

The purpose of this enclosure is to not only serve as an education medium revolving the ecosystem of the giant pandas but to also prepare the Pandas for the outside world. By planting different species of bamboos on the different levels of the enclosure, this would train them to seek for their own food while training their survival skills.

Flora and Fauna of the Zoo

1 Tibetan Snowcock Bird
2 Tibetan Sandgrouse
3 Giant Babax
4 Tibetan Eared Pheasant
5 Chimonobambusa Quadrangularis (Square Bamboo)
6 Giant Panda
7 Bambusa Sinospinosa (Thorny Bamboo)
8 Dendrocalamus Latiflorus (Mei-Nung Bamboo)





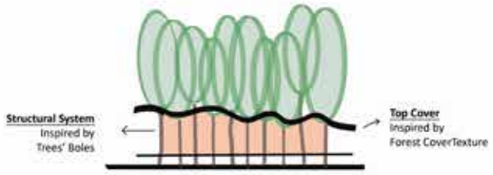
Journey through the Forest
Can the Bamboo Forest Become the Panda House Itself?

Mehmet Caferoglu

Forests as a Source of Inspiration
This design started with the question: »Do pandas have a house?« and sought to find a method for making pandas feel at home. At the same time, it is aimed at designing a building where visitors can better experience the natural environment of pandas. Pandas are wild animals which normally live in bamboo forests at the heart of a natural landscape. The building is thus inspired by such forests. The multiple structural poles within the building are inspired by bamboo poles and the organic top cover is inspired by forestry. This brings visitors closer to the experience of wandering within a bamboo forest.

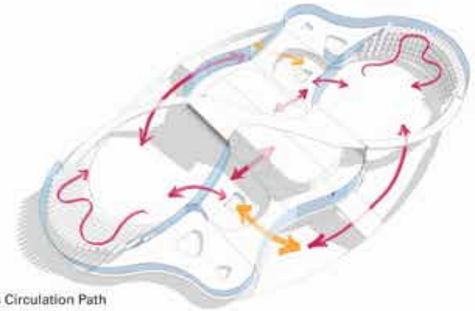
Interaction
Interaction between pandas and humans is one of the core aspects of this project. The design provides different boundary typologies to create diverse experiences for visitors. It also creates semi-private areas for the panda. When pandas do not wish to see visitors they are able to retreat to these areas, although visitors may continue to observe them behind boundaries with a limited view. The »Interactive Wall« is aimed at attracting visitors' attention by inviting them to play the »Find the Panda« game. The purpose of the »Angle Wall« is to play with viewers' perceptions.

The Diversity of Circulation
The design creates a wide range of alternative circulation routes for both pandas and visitors. The visitor's route draws inspiration from the Möbius Strip, also called the twisted cylinder, in order to maintain continuous and fluid circulation. Visitors can access different levels and explore different perspectives on their route which comprises ramps leading to the roof as well as indoor and outdoor exhibition and observation spaces. The project is designed for two pandas of different genders. These two pandas have different sub-spaces within their territory, although during certain periods the individual panda habitats can be merged to form one large single habitat.



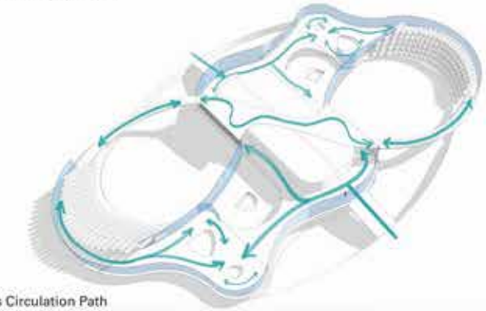
Ground Floor User Diagram:

- Outdoor Enclosures for Male Panda
- Inside Enclosures for Male Panda
- Outdoor Enclosures for Female Panda
- Inside Enclosures for Female Panda
- Visitors' Area
- Zookeeper & Technical Area

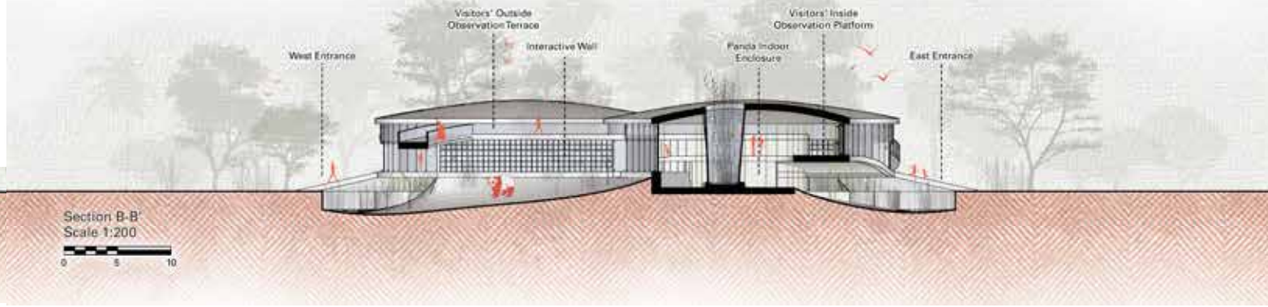


Pandas Circulation Path

- Connection between two pandas at certain times.
- Pandas' Daily Circulation

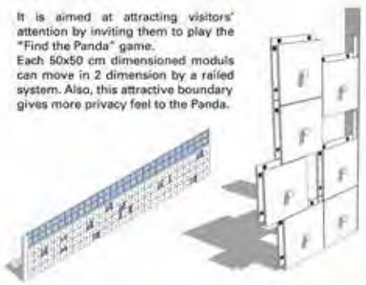


Visitors Circulation Path



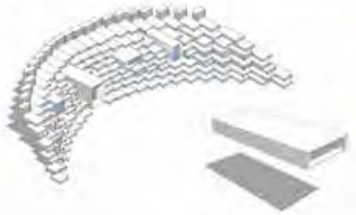
Interactive Wall :

It is aimed at attracting visitors' attention by inviting them to play the "Find the Panda" game.
Each 50x50 cm dimensioned moduls can move in 2 dimension by a railed system. Also, this attractive boundary gives more privacy feel to the Panda.



Angle Wall :

The purpose of the "Angle Wall" is to play with viewers' perceptions. It is a huge climbable Amphi for the Pandas, which builded with simple rectangular boxes. It offers limited perspective to the visitors, that creates an attractive effect.



Journey through the Panda House
Visitors' Route Perspective Views :

1 - **Visitors' Outside Journey Ramp**
From Ramp to Panda Outside Enclosure
Visitors can access to the roof and explore different perspectives on their route by the ramp.

2 - **Entrance Bridge**
From Bridge to Entrance Rolling Door

3 - **Moat as an Enclosure for Panda**
From Bridge to Entrance Rolling Door

4 - **Roof Observation Terrace**
From Top to Entrance Rolling Door

5 - **Visitors' Outside Journey Ramp**
From Ramp to the Roof Terrace

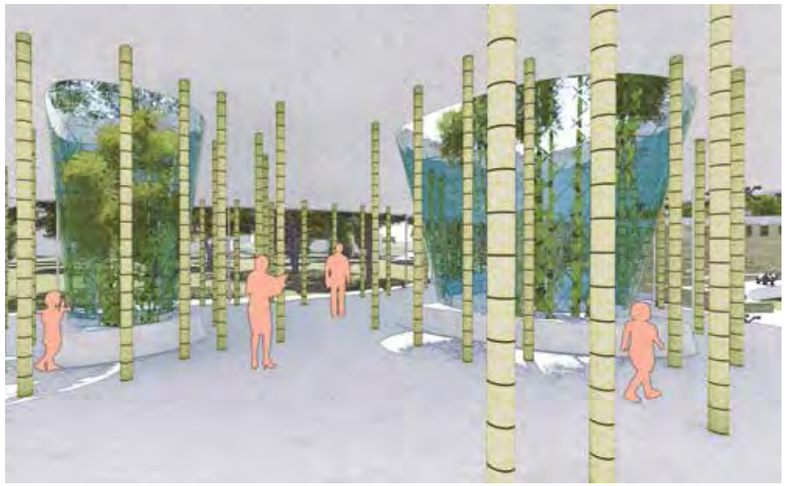
6 - **Visitors' Journey Inside Area with Bamboo Aquariums**

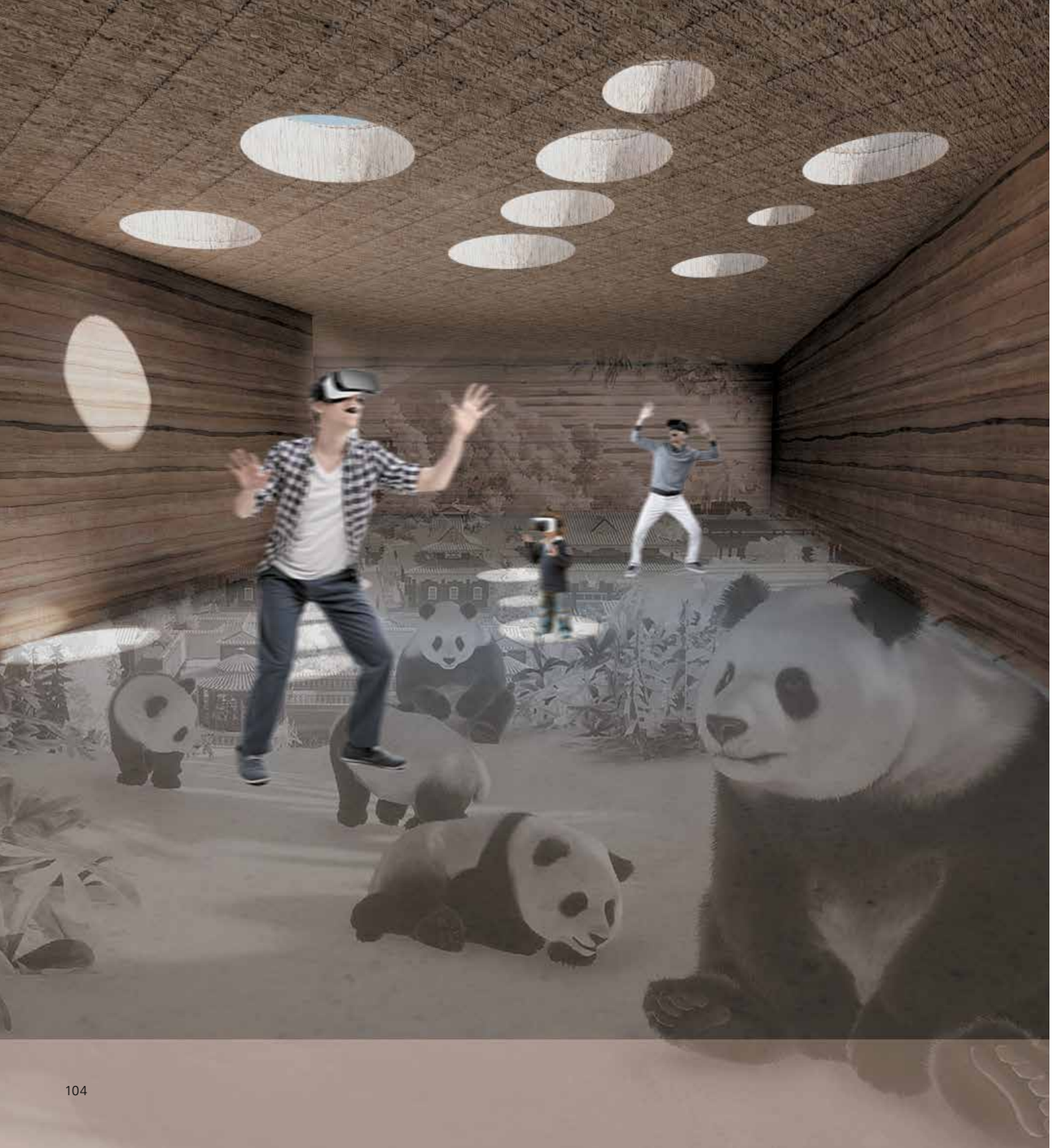
7 - **Panda Indoor Enclosure**
From Visitors' Area

8 - **Conections Between Panda Indoor Enclosure and Zookeeper Area**

9 - **Interactive Wall**

10 - **Angle Wall**





How on EARTH …? Down to EARTH!
Can Rammed Earth Elicit Emotions between Humankind and Animals and Transpire as the Future Material of Zoos?

Anotidaishe Mavazhe

Materials and Prefabrication
Made from locally excavated earth, this enclosure demonstrates the practical and aesthetic benefits of a material which is so often dismissed as inferior or irrelevant for contemporary buildings. The enclosure and structure are entirely made from rammed earth; therefore the zoo is 99 % recyclable. Complementing the structure is a wooden roof covered in straw.

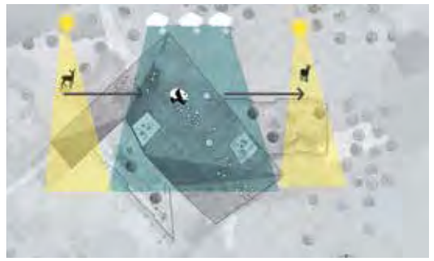
A Rotary Exhibit
The aim here is to bring the panda to an African country: Hwange National Park in Zimbabwe. This will in turn allow tourists and locals to visit the enclosure and witness a non-indigenous animal. Due to its location and climate the enclosure hosts the panda during the winter period and other animals within the national park afterwards. The threshold between humankind and pandas has been redefined by harnessing different stylistic openings and displacing the concept of cages. This is intended to forge an intimate relationship, appealing to the visitor's emotions through experiences, exhibitions and redefined thresholds.

Circulation and Experience
The design concept aims to understand the relationship between humankind and natural landscapes within the enclosure as a design medium, a medium that will provide opportunities to reconfigure spaces. This will be achieved through amplification, abstraction, purification, materialisation and juxtaposition. The intent of the design is therefore to stimulate a sensory haptic quality, enabling a reconciliation between the visitor with the animal and its habitat. This experience will be made possible in the design enclosure through the process of stimulating different senses. Materiality will therefore serve as an important factor in the physical construction of the landscape. This experience will be enhanced through spatial manipulation. Circulation is a key element to the visitor's experience and will be designed to maximise the zoo experience, lending structure to a coherent story within the exhibition space.
This »romantic relationship« between the maker and nature informed the design of a building that seeks to achieve a similar sense of mystery and unpredictability in its layout and materiality.

Second floor

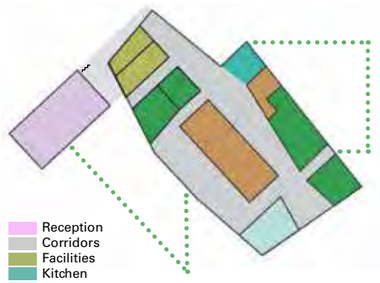
Ground floor

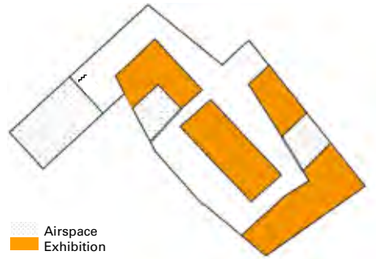
Location Concept



Panda exhibited during the winter period only

1 Wall Exhibition
2 Skeleton Exhibit
3 Reading Pod
4 Projected Exhibit
5 Virtual Reality
6 Disabled Exhibit





1 Meeting Point/Reception
2 Reception
3 WC
4 Delivery room
5 Storage
6 Bamboo Storage
7 Indoor Enclosure Male/Female
8 Panda Stall Male
9 Panda Stall Female
10 Cub Stall
11 Panda Stall Female
12 Ablution
13 Kitchen
14 Incubator
15 Exterior Enclosure
16 Zookeeper Lounge
17 Changing room
18 Locker room
19 Showers
20 Circulation

East elevation

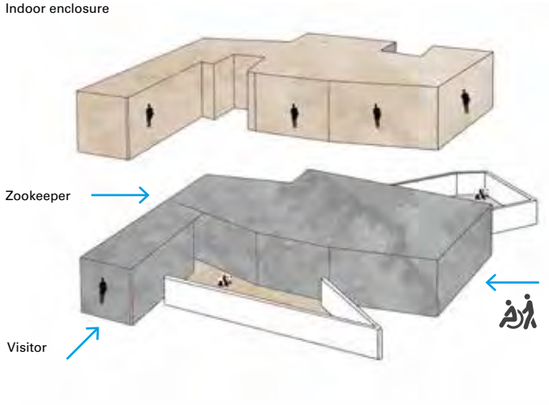
0 2 10 20

Section A

South elevation

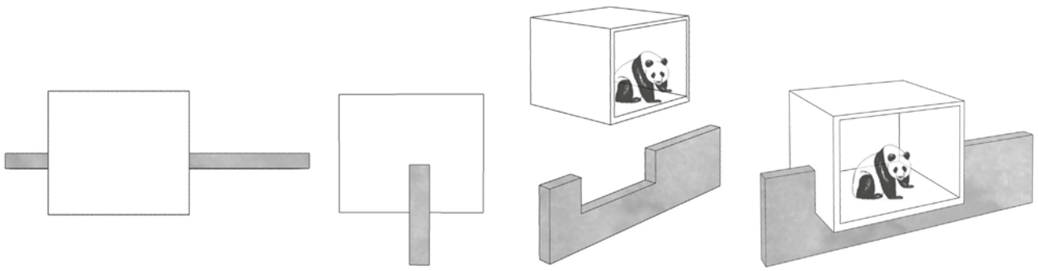
Section B

Indoor enclosure



Exibition space

Panda box



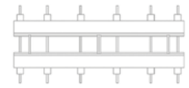
1 Rammed earth construction in Horsham, Australia
Photo: Rammed Earth Enterprises

2 Layers of rammed earth
Photo: Wikipedia, Grégoire Paccoud

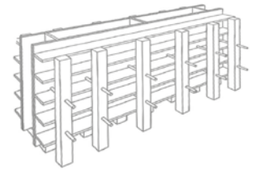
3 Hardwoods Bamboo lasertable wood sheets

Walls
The core areas are supported, made out of a mixture of sand, gravel, loam and concrete and compacted by means of a pneumatic tamping device.
This results in an aesthetically pleasing sediment look after removal of the formwork. The goal is to achieve a zero-energy building. At the same time the walls serve as hygroscopic moisture storage and have a very good effect on the indoor climate.
Further advantages: low technical effort, inexpensive, fire-resistant, good room acoustics. Ecologically, because the material is on site and thus saves transport costs.

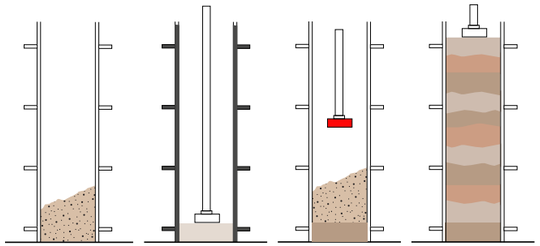
Fine sediments
The aesthetic charm of the layered structure is an additional rural design plus. Beautiful is above all the storage capacity.



Reinforced plywood frame



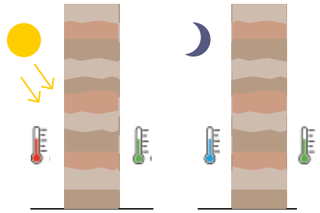
System Diagram: Rammed earth compressed



Moist earth mixture of sand, gravel, clay and concrete

Reinforced plywood frame

Pneumatic backfill tamper



Day: Wall absorbs heat slowly and keeps the internal temperature stable.

Night: Wall releases the heat absorbed during the day, releasing it at night.

Beyond Observing and Being Observed

A Playground to Observe, Experience and Understand Pandas Amidst Nature

Ebru Aykan

Creating a New Relationship

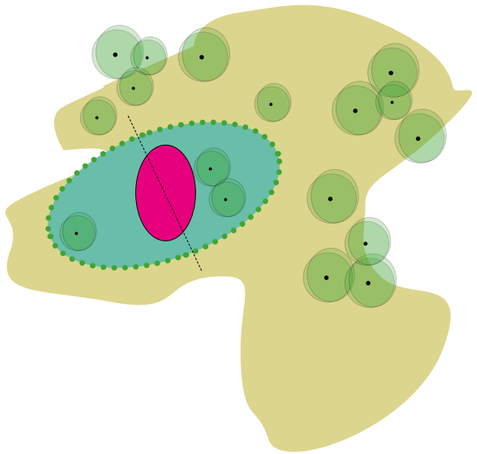
At zoos there is a very limited relationship between animals and visitors. Visitors merely observe animals and then continue on their way quickly. This project seeks to create a new type of relationship. It attempts to provide pandas with a natural setting to live in and visitors with different opportunities for observations and experiences, emulating a playground. Through this method, animals can spend time within a natural setting and visitors may observe, witness and understand how they live.

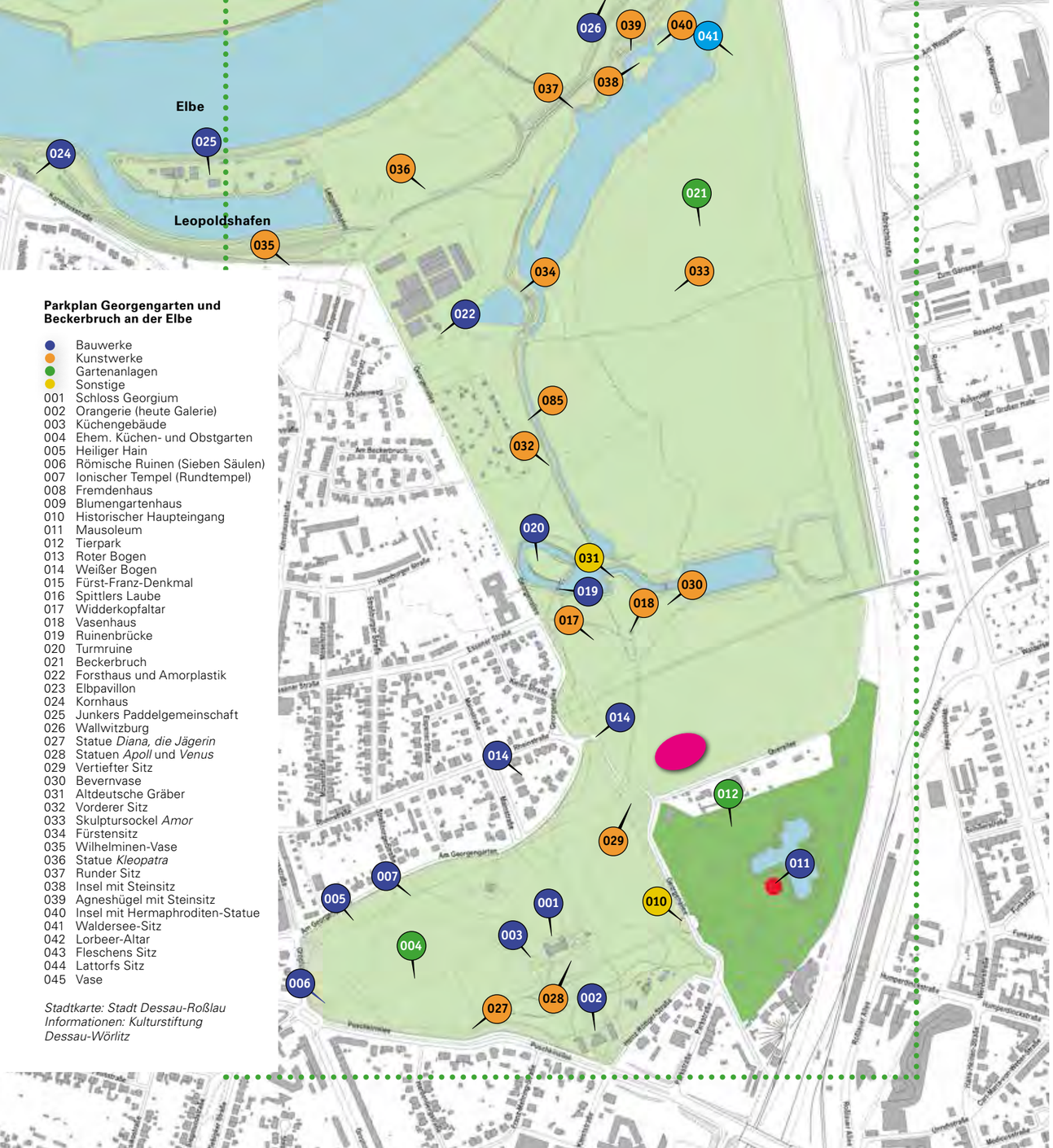
Design in a Natural Setting

We commonly see animals at zoos in cages or boxes which imitate nature. From the outset, this project aims to give animals an authentic natural site in which to live. Thus, visitors can witness pandas climbing, lying down or sleeping amidst trees. For this reason the chosen site of the project is a forest.

Expanding upon the Zoo Experience

Experiences of zoos are usually very short and last a mere moment or two. This project attempts to translate this into a fluid process, behaving like a playground for visitors. Visitors may witness pandas from different angles, heights, levels and indoor and outdoor spaces, although they may not always be able to spot them among the trees. There are also different viewpoints for children and adults which can be helpful in shaping children's own experiences.





Parkplan Georgengarten und Beckerbruch an der Elbe

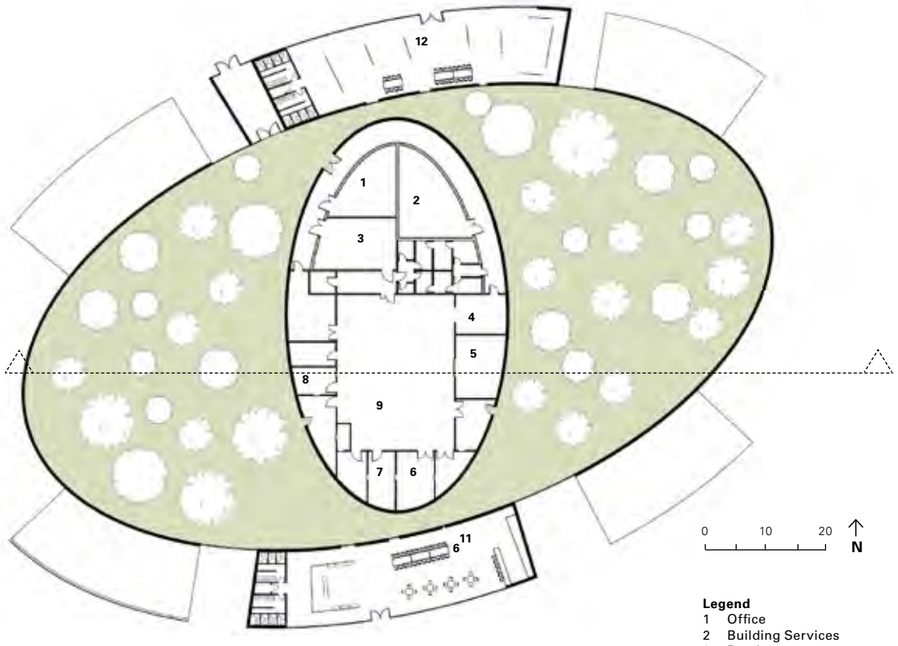
- Bauwerke
- Kunstwerke
- Gartenanlagen
- Sonstige

001 Schloss Georgium
002 Orangerie (heute Galerie)
003 Küchengebäude
004 Ehem. Küchen- und Obstgarten
005 Heiliger Hain
006 Römische Ruinen (Sieben Säulen)
007 Ionischer Tempel (Rundtempel)
008 Fremdenhaus
009 Blumengartenhaus
010 Historischer Haupteingang
011 Mausoleum
012 Tierpark
013 Roter Bogen
014 Weißer Bogen
015 Fürst-Franz-Denkmal
016 Spittlers Laube
017 Widderkopfaltar
018 Vasenhaus
019 Ruinenbrücke
020 Turmruine
021 Beckerbruch
022 Forsthaus und Amorplastik
023 Elbpavillon
024 Kornhaus
025 Junkers Paddelgemeinschaft
026 Wallwitzburg
027 Statue *Diana, die Jägerin*
028 Statuen *Apoll* und *Venus*
029 Vertiefter Sitz
030 Bevernvase
031 Altdeutsche Gräber
032 Vorderer Sitz
033 Skulptursockel *Amor*
034 Fürstensitz
035 Wilhelminen-Vase
036 Statue *Kleopatra*
037 Runder Sitz
038 Insel mit Steinsitz
039 Agneshügel mit Steinsitz
040 Insel mit Hermaphroditen-Statue
041 Waldersee-Sitz
042 Lorbeer-Altar
043 Fleschens Sitz
044 Lattorfs Sitz
045 Vase

Stadtkarte: Stadt Dessau-Roßlau
Informationen: Kulturstiftung Dessau-Wörlitz

Next to the Zoo
A historically significant location, the Georgengarten in Dessau was chosen for the project. Next door to an existing animal park.

TIERPARK DESSAU



Ground floor

Legend
1 Office
2 Building Services
3 Bamboo storage
4 Nursing room
5 Veterinary clinic
6 Mother child box
7 Panda female
8 Panda male
9 Fodder preparation
10 Zoo keeper lounge
11 Coffee shop
12 Education/Exhibition

Section

Visionary New Agenda

The project dealed with the construction of a new panda house. The central aim of the course was to consider architecture as an **alliance of form, biology, and ethics** unleashes new and exciting possibilities in the design of zoo buildings. My final work should not only spark discussion about contemporary animal husbandry, but also provide important and innovative inspiration for the up-to-date transfer of knowledge in zoos.

For me as an architect the most important point is to expand the scope of experience between animals and visitors. In zoos, people can generally only enjoy a very limited view at a fast pace. This is why I chose a forest as the site. The project tries to create an architectural path in nature, which can enable a better understanding for wildlife outside of human civilisation. The focus among other things is to awaken an understanding for animals and nature through careful architecture. Visitors should learn to understand life and ecological interrelations by **observing, but without disturbing**. This project aims to create a valuable atmosphere and spaces for both animals and visitors. The design prefers natural materials related to the location and use. Thus, this 'playground' stands as a big wooden structure with grass, trees, and some amount of glass. These materials provide and facilitate a natural atmosphere.

Bamboo Playground
How to Reconnect Sustainable Nature

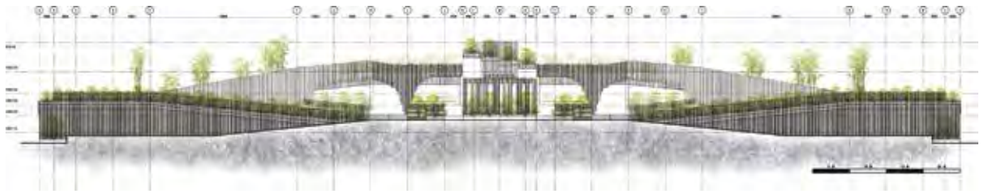
Eddie Goh

Natural Architecture
Here, nature serves as a framework for setting structure. The aim is therefore to build »into« nature, rather than »on to« nature. The form of the design strongly resembles that of a mountain and blends into the site by harnessing organic and low-profile materials, providing the giant pandas with the most authentic setting possible. Bamboo is a low-cost and sustainable material that is intensively grown locally. This material has been historically used in the countryside for the fabrication of handicrafts, native architecture and utilitarian objects.

The Elimination of Barriers
This project is designed to create spaces that allow visitors and giant pandas to remain on the same level throughout, eliminating physical barriers in between and achieving closer encounters and views without any obstacles. Bamboo structures are used to create an interesting interplay between vertical and horizontal lines. In some spaces, vertical and horizontal elements intensify to form a psychedelic perspective, evoking a profound sensory perception.

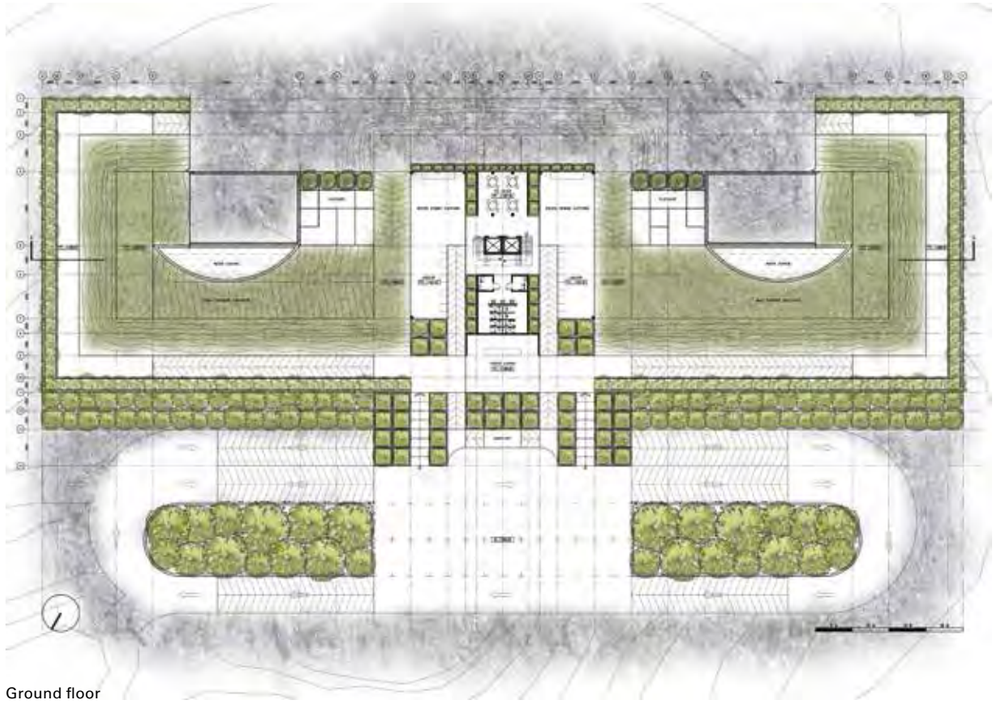
Surroundings
Architecture is an interplay between mass and hollow space. In this design, space and body stand in a complementary relationship to each other, continuously merging. In this strictly symmetrical Panda House Architecture guides the path through the rhythm of the space and determines the circulation route of visitors and Pandas at the same time. Visitors surround the giant pandas from different viewpoints which afford diverse experiences. Open and active spaces with visual connections enhance the recreational experience.

Cameron Highlands, Malaysia
To create a haven for the giant pandas where they will feel at home is to go back into the nature and provide them an authentic environment. Locating the site in a beautiful tea plantation in Cameron Highlands, one of the most popular nature attraction in Malaysia with breath-taking sceneries and refreshing climate on a mountain. This architecture connects human, giant pandas and the nature through rejuvenating recreational experiences.

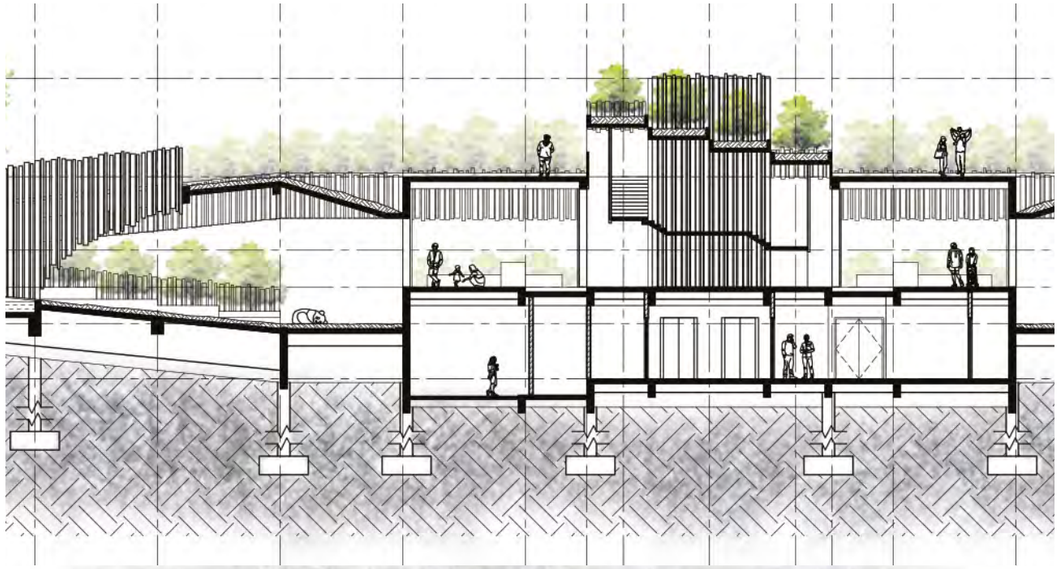


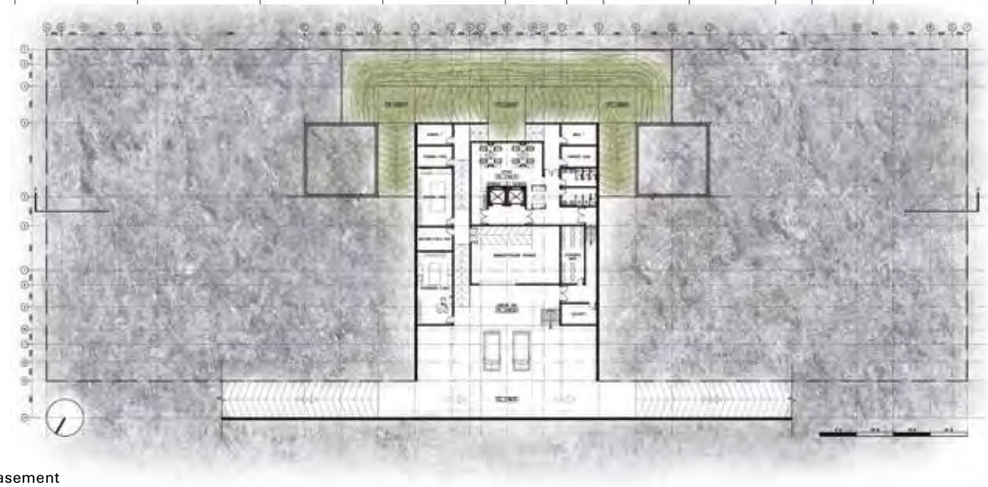
Elevation

Section



Ground floor





Basement

Up and Down

With viewing platforms on different locations, allowing the visitors to watch the giant pandas from different angles without any obstacle.

Barrier Elimination

Using moats with gentle sloap to eliminate the need of physical barriers, allowing a closer encounter between the giant pandas and the visitors.

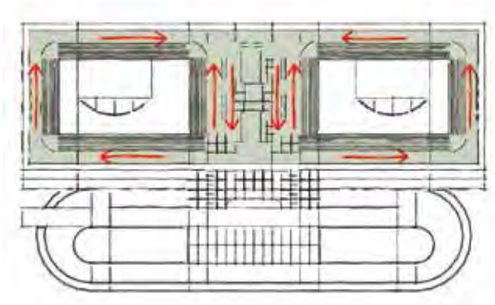
Walking With the Pandas

Using ramps to create circulations that allow the visitors and giant pandas to stay at the same level all the time while eliminating physical barriers in between.

Circulation

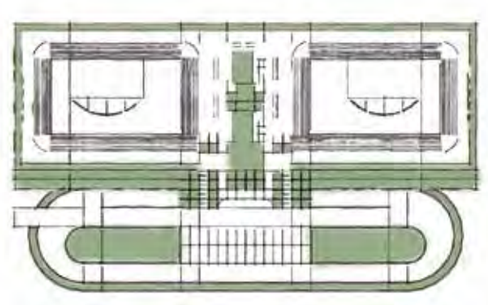
Surround & Around

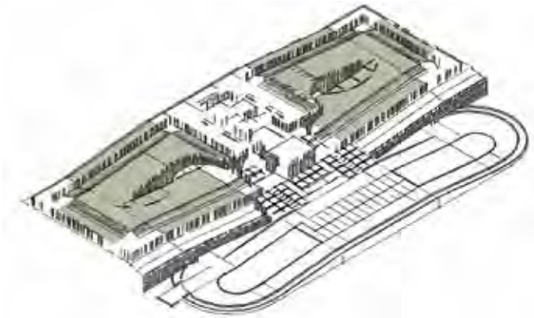
Create activities and encourage circulation surrounding the giant pandas with different views and experience.



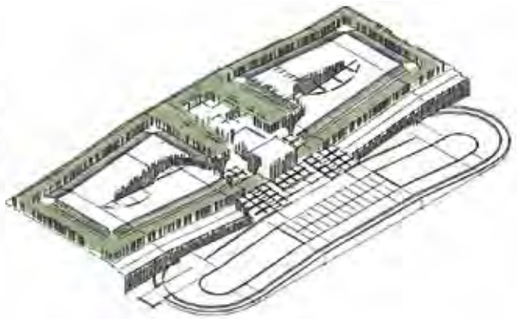
Pocket Garden

With multiple pocket gardens in the architecture, not only it brings aesthetic quality but also allowing the visitors to plant, harvest and enjoy their own tea leaves.

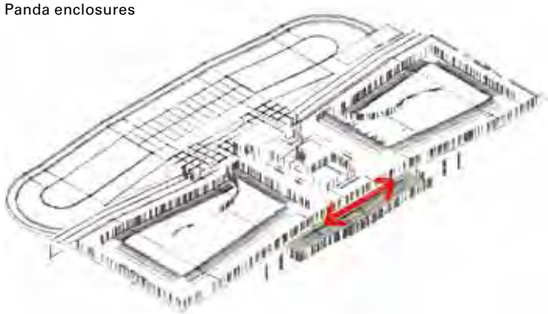




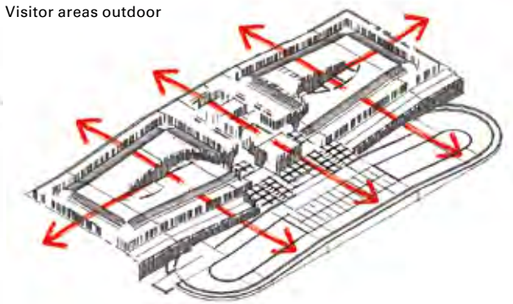
Panda enclosures



Visitor areas outdoor



Entrance area



Panorama views

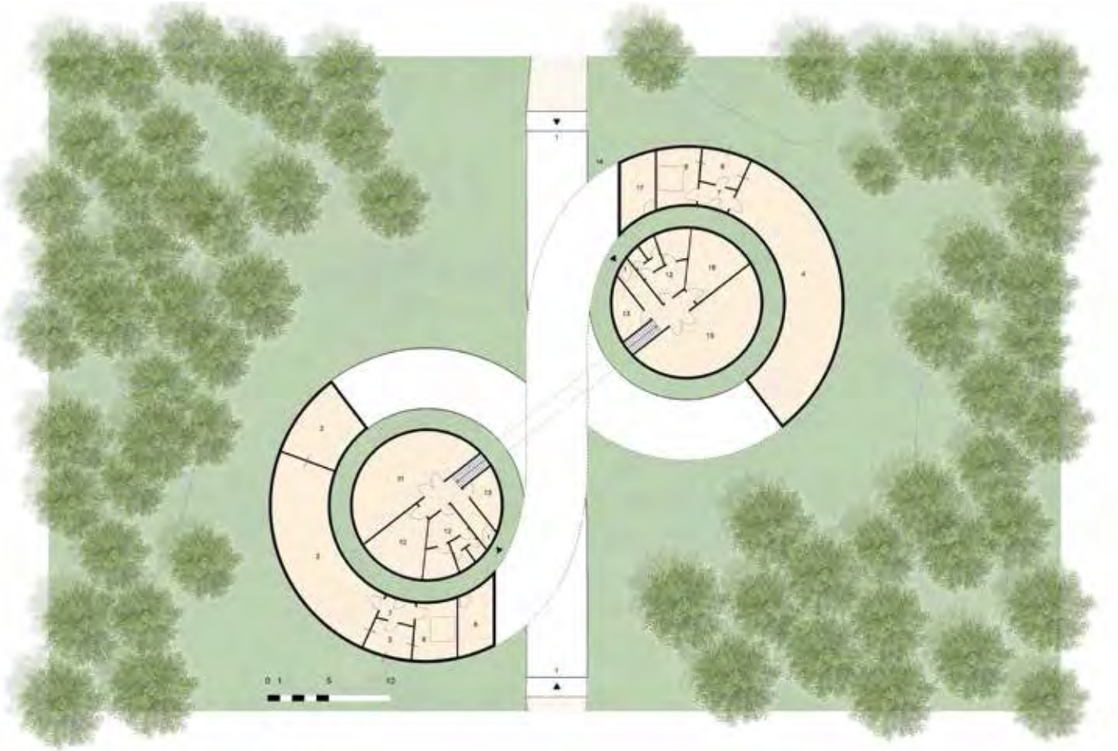
The Panda: A Reluctant Superstar
How to Lead Zoos through Uncertain Times

Manuela Grigorescu

Education through a Learning Path
The giant panda is one of the world's rarest mammals and, at the same time, a worldwide symbol of conservation. The aim of my design is to take visitors on a journey, where they can learn about this very peculiar species with its unique and remarkable characteristics. I have designed the building in the shape of an infinite loop. Architecture construed as a path of adventure is intended as an invitation prompting ***continuous movement***. In this way, different attractions and views invite visitors to explore the unknown world of the panda from different levels and perspectives.

Architecture as a Symbol of Self-identity
The task here has been to create a physical environment for visitors which conveys a sense of specific identity and which is ***non-alienating***. The wooden spiral incorporates the natural habitat into the architecture and evokes a sense of belonging which is not verbalised. Instead of visible borders, the building functions as its own border. You can always look outside, but there are also sections which invite visitors to stay longer, rest, absorb information or enjoy the landscape. If you are lucky, you will have the opportunity to see a panda; if not, you will have felt its presence.

Location
The panda house is placed on a plateau between two hills in the Carpathian Mountains in Romania, close to a bear sanctuary near Zarnesti, surrounded by oak and hazel forests. This building could also be placed elsewhere on mountains from across the world, provided there are similar weather conditions. The climate is nearly identical to the climate in Sichuan (China), where the giant panda originally derives from. The airy wooden facade allows the surroundings to shine through and gives visitors a ***feeling of shelter***.



Ground floor

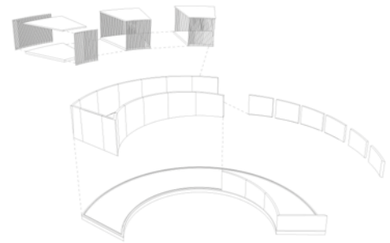
Elevation

Legend

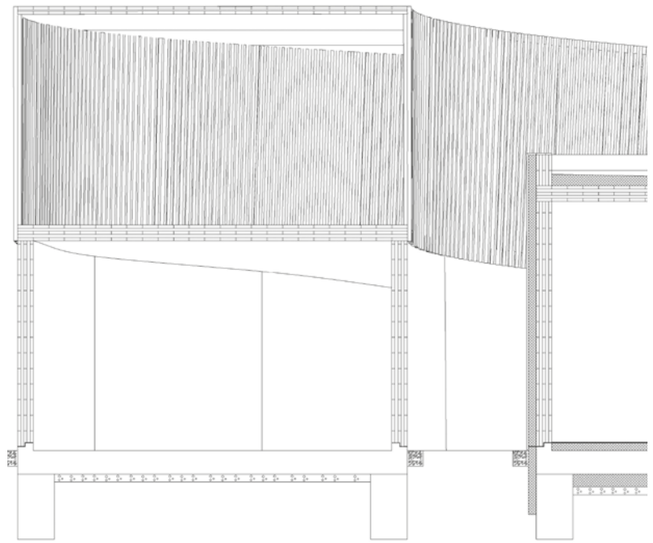
1 Entrance
2 Indoor Space Female 71,1m²
3 Mother – Child Space 25,9m²
4 Indoor Space Male 97,4m²
5 Intermediate Space Female 9,7m²
6 Intermediate Space Male 9,7m²
7 Enclosure (only keepers) 5,0m²
8 Training Area (with Transport Box 16,0m²
9 Laboratory 14,54m²
10 Nursing Area 18,9m²
11 Clinic 49,0m²
12 Changing Area 18,6m²
13 Technical Room 9,3m²
14 Delivery Area Bamboo
15 Cold Storage 49,0m²
16 Food Preparation 19,0m²
17 Keeper Lounge 14,5m²

Food gate
Panda indoor area
Keepers area
Clinic
Technical Area

Perspective



Module system



System section

Pandaia
Giant Panda Research Facility and Exhibition at the Tierpark Berlin-Friedrichsfelde

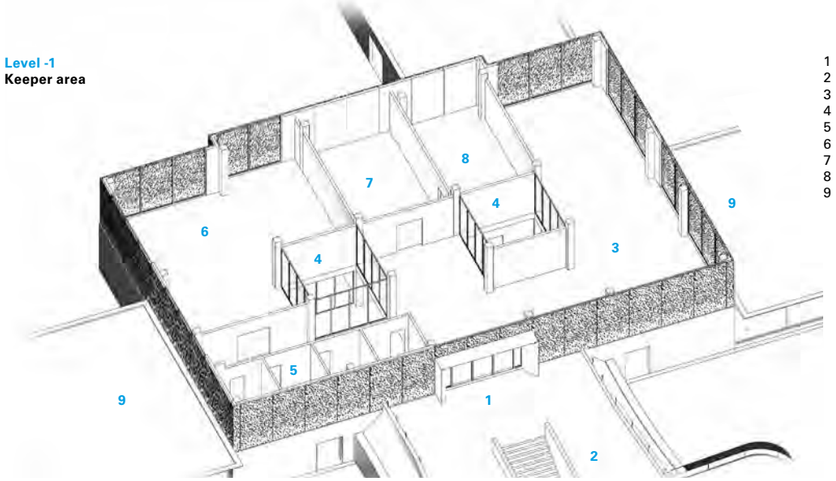
Martin Hundeshagen

Combining Visitor Attractions
Located in one of the largest animal parks, this new panda house benefits from the existing infrastructure and the integration of scientific research facilities, such as the Leibnitz Institute for Zoo and Wildlife Research. The attractive location of the building next to Friedrichsfelde Palace, in an area covered with dense trees, also offers sufficient space for future extensions.

Geometry in Nature
The strictly geometrical two-storey building with its gently curved outdoor enclosures respects not only the architecture of the nearby palace, but also above all the pandas' habitat. Facilities for animals and keepers (ca. 800 sqm) are located within the basement. Whereas the plinth area is solid, the upper floor features a light glass construction with a perforated metal shell which conjures up an interplay of light within the interior.

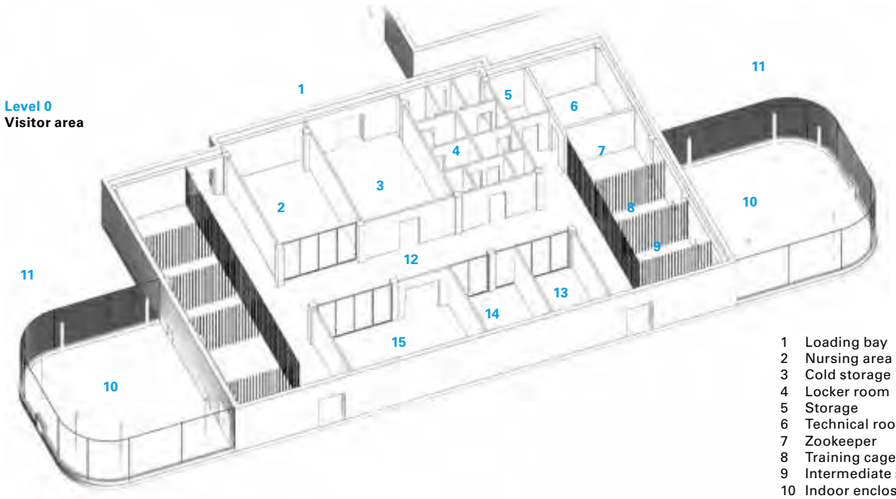
Access and Presentation
The visitor's entrance and loading bay are on the northern side of the building. Visitor areas and multifunctional exhibition spaces are located on the second level. The upper floor (ca. 560 sqm) is accessed on the southern side via a barrier-free ramp and stairs, flanked by three panoramic planes. Another observation spot is somewhat more hidden and gives insight into the indoor enclosure. The observation points are located at different levels, so that pandas remain visible to visitors from as many places as possible, although these do have at their disposal enough places in which to retreat.

Level -1
Keeper area



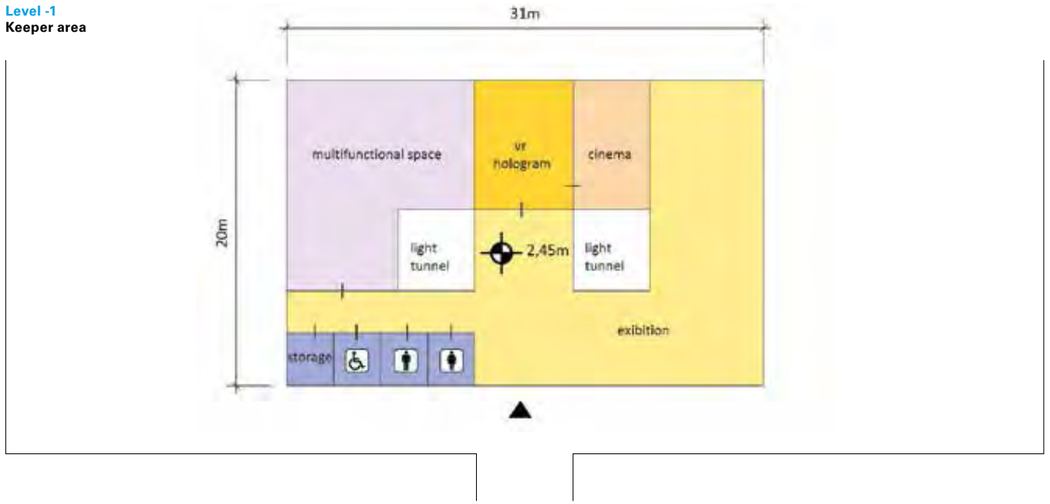
1 Entrance
2 Ramp
3 Exhibition area
4 Light tunnel
5 Restrooms/storage
6 Multifunctional space
7 Hologram room
8 Cinema
9 Indoor enclosures

Level 0
Visitor area

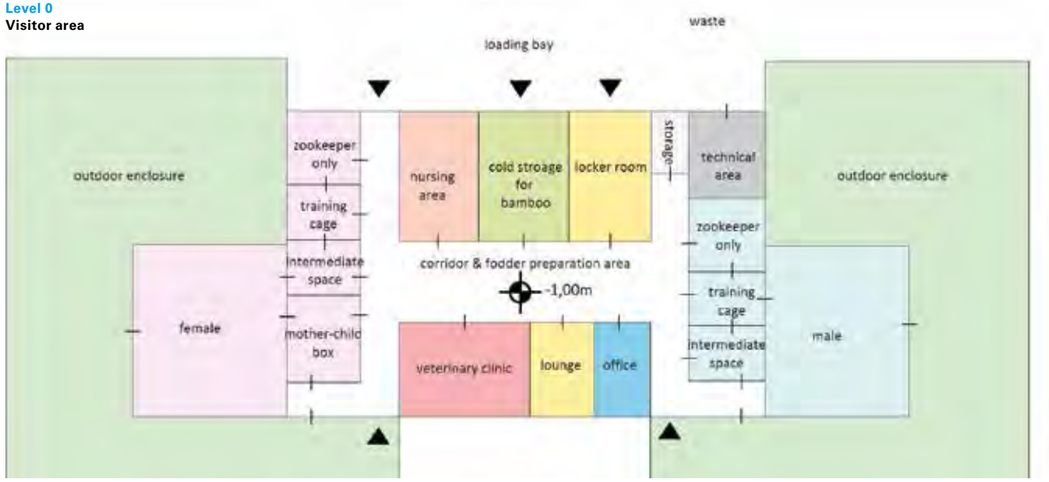


1 Loading bay
2 Nursing area
3 Cold storage
4 Locker room
5 Storage
6 Technical room
7 Zookeeper
8 Training cage
9 Intermediate space
10 Indoor enclosure
11 Outdoor enclosure
12 Corridor/Fodder preparation area
13 Office
14 Keepers lounge
15 Veterinary clinic

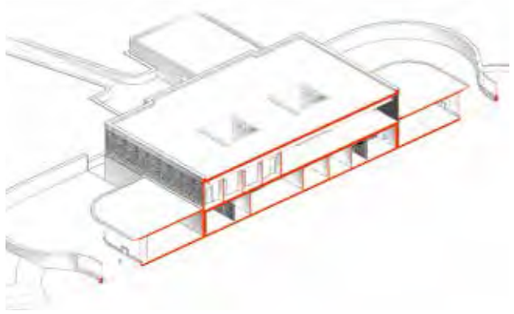
Level -1
Keeper area



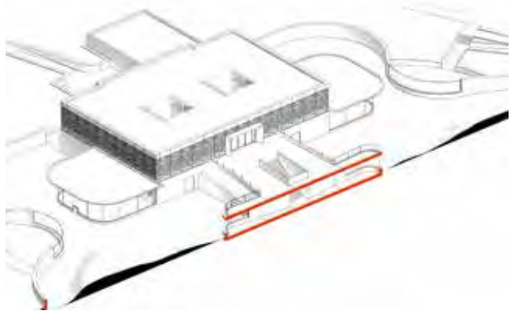
Level 0
Visitor area



Perspective



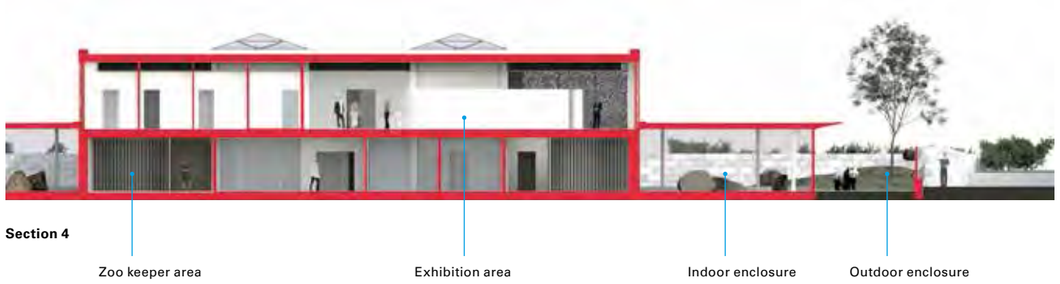
Section 1



Section 2

Perspective entrance

Section 3



Section 4

South elevation

East elevation

The Rise of the Dragon
A Panda House Surrounded by Public Spaces

Veronika Langen

The Idea
My idea is to develop a kilometre-long path for cyclists and pedestrians. This path is to include all spaces needed for a panda house, albeit remaining enclosed in form. In Dessau North a beautiful urban park collides with untouched nature, with only a river dividing the two contrasts in setting. My sculpture now unites them.

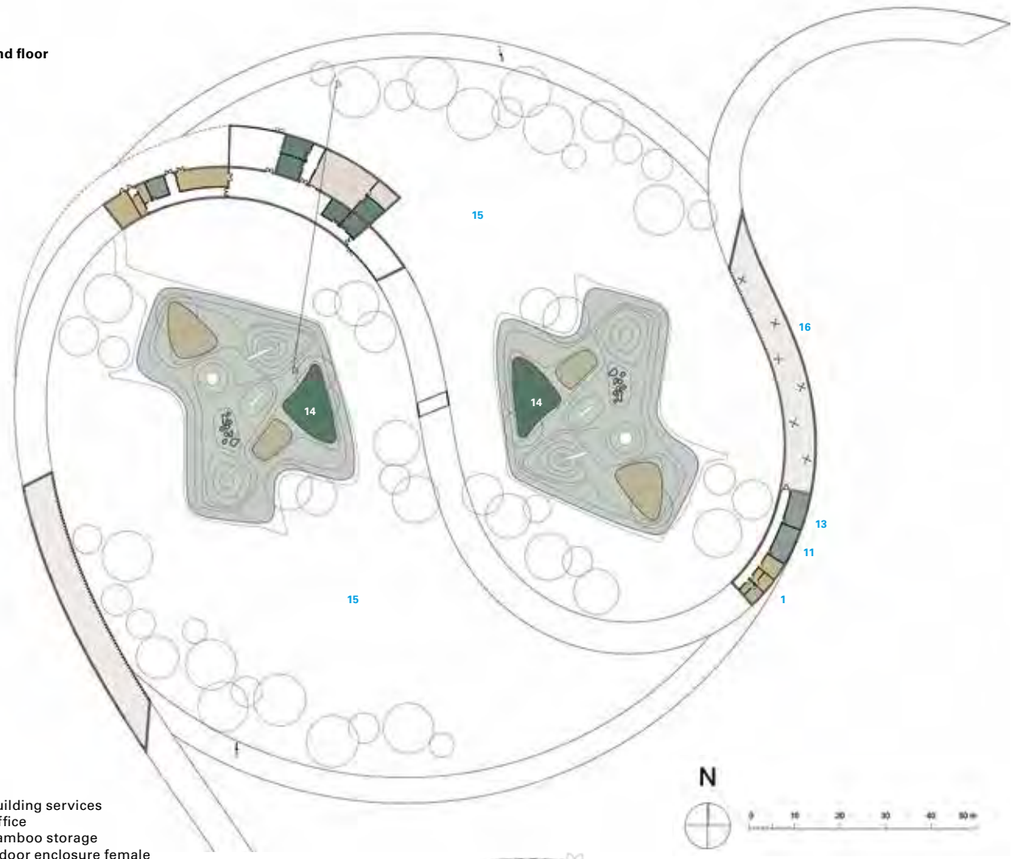
The Concept
Inspired by a Chinese dragon, my sculpture winds its way across the natural landscape in a curved motion. This journey amidst this natural setting is packed with experiences. There are diverse viewpoints, places to linger and various meeting points. In harmony with nature, pandas are also able to find a suitable home here.

The Context
Water, wind, earth – everything is granted by nature. On the back of the dragon you can hear the rushing water of the river. The wind blows. Wherever you look there are trees, shrubbery and earth. The dragon, as if it has always been there, forms an inherent strand of nature. Its shape gives rise to the spaces.

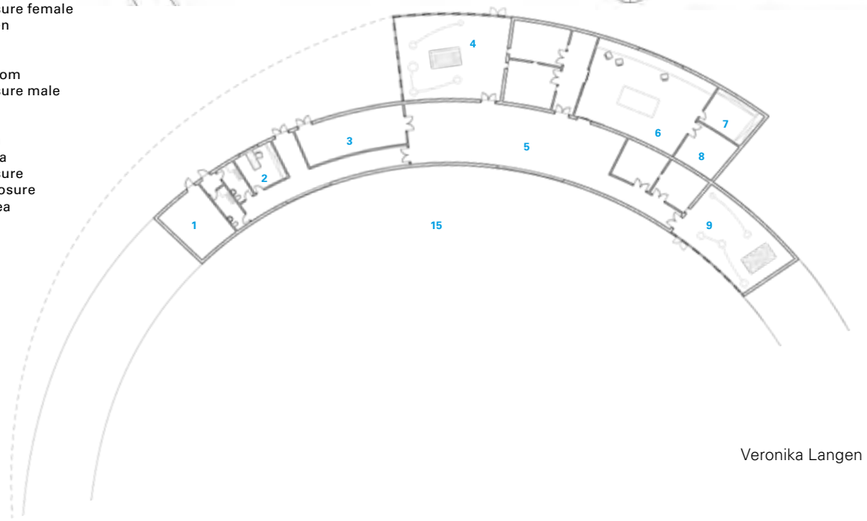
Site plan

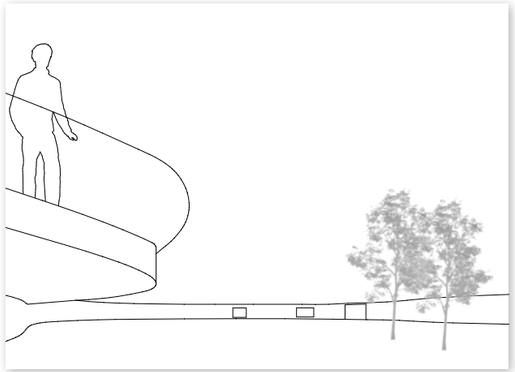
Section

Ground floor



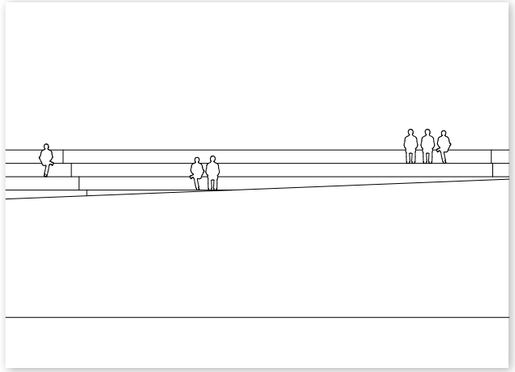
1 Building services
2 Office
3 Bamboo storage
4 Indoor enclosure female
5 Fodder kitchen
6 Doctor
7 Storage
8 Incubation room
9 Indoor enclosure male
10 Kitchen
11 Library
12 Lecture room
13 Exhbition area
14 Indoor enclosure
15 Outdoor enclosure
16 Exhibition area



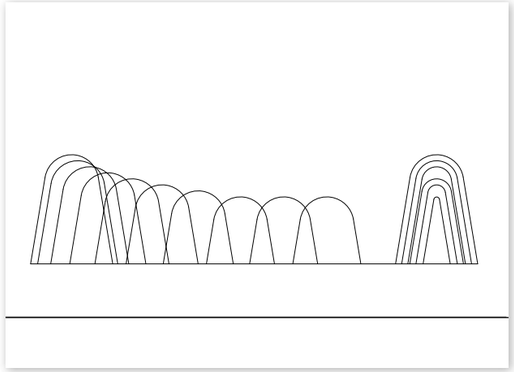


Viewing platforms

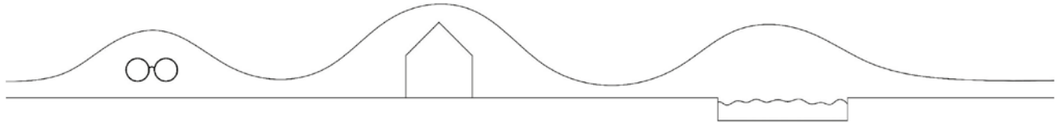
Guided view



Places to rest



Sculptured pathways

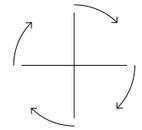


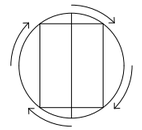
Experience
learn from and with
nature and animals

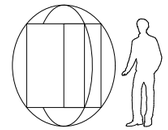
Shelter
viewpoints, places to linger
and various meeting points

Nature
urban park meets
with untouched nature

Guided Science | Educational spaces







Meeting points

Set of guided pathways

Panda Village
How Cluster-like Architecture Benefits the Natural Community

Anna Thum

Clusters of an Interlocking Geometry
Clusters of an interlocking geometry are a metaphor for the »Panda Village«, where the aim is to reinforce the relationship between humans, pandas and nature. This metaphor is translated into the master plan layout and design form. Each cluster serves its own purpose and caters to a different programme; the interlocking design creates different volumes which bring out the essence of the spatial experience for users.

A Journey of Vitality
This enclosure is intended to foster a dynamic and enthusiastic spirit and vigor. The flow of circulation between programmes helps to develop a package of engagement activities involving learning, fun and leisure. Hence, programmes such as bamboo craft studios and tea houses provide a broader platform for visitors to feel involved in the panda enclosure, opening up different perspectives.

A Dynamic Duet between Transparency and Opaqueness
The focus on the visual experience of both visitors and pandas is a crucial element in the design for the facade and roof. This does not involve arbitrary – but rather well-thought-through – decisions when it comes to determining open and enclosed spaces. Full-height glass facades and openings help to frame the outdoor view and panda activities. This further enhances the relationship between the interior and exterior. The glass roof breathes life into the interior and casts interesting patterns of shade. The enclosed spaces introduce feature walls, patterned screens and weave ceilings, creating a harmonious indoor experience.

Design Parameters

Site Brief

Located next to Berlin Zoo, this park is an interesting spot for the designated proposal. The site is surrounded by lake and islands, naturally formed a few picturesque spots for the proposed design building. There is a café next to the site, which becomes one of the main sources for the proposed enclosure to attract visitors with the designated programs and its architectural features.

- Water (Lake)
- Earth (Site Contour)
- Wood (Trees)
- Fire (People)
- Metal (Existing Building)

1. Typical blocks design

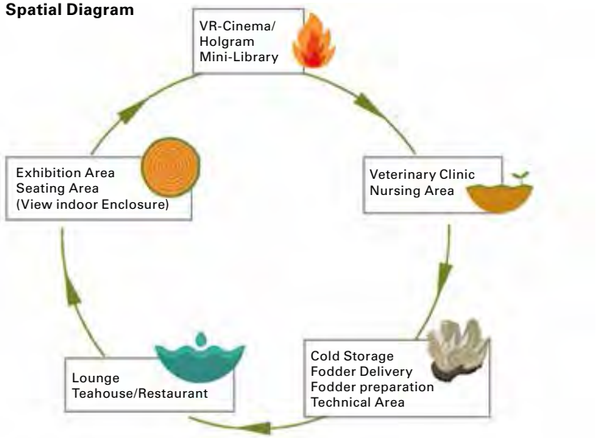
2. One block is moved and elevated to create 2 floors and interlocking.

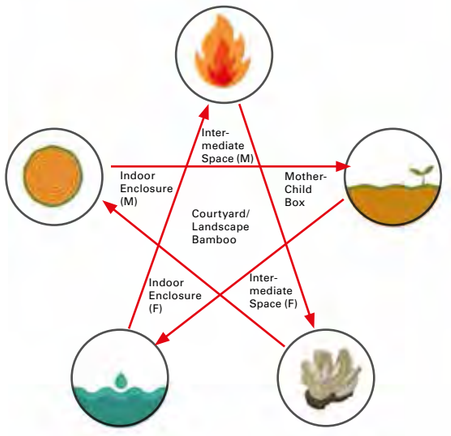
3. Blocks are rotated to catch the best view on site. Interlocks are further enhanced.

4. Opening on facade and roof to frame view and bring light.

5. A section of block is taken away to enhance overall architecture feature visually

Spatial Diagram





Front elevation

Side elevations

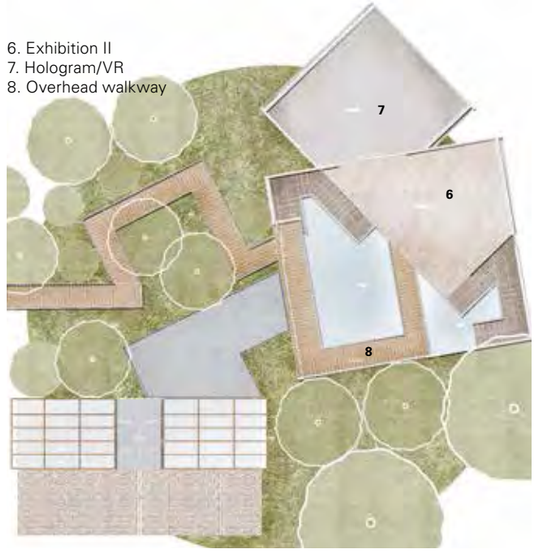
Site plan

A: Arrival and Exhibition
B: Exhibition and VR Room
C: Dining/Cafe/Tea House/Bar
D: Exhibition and VR Room
E: Cultural Gallery and Bamboo Craft
F: Panda Enclosure

1. Arrival
2. Lounge
3. Locker/Storage
4. Corridor

A: Arrival and Exhibition

6. Exhibition II
7. Hologram/VR
8. Overhead walkway

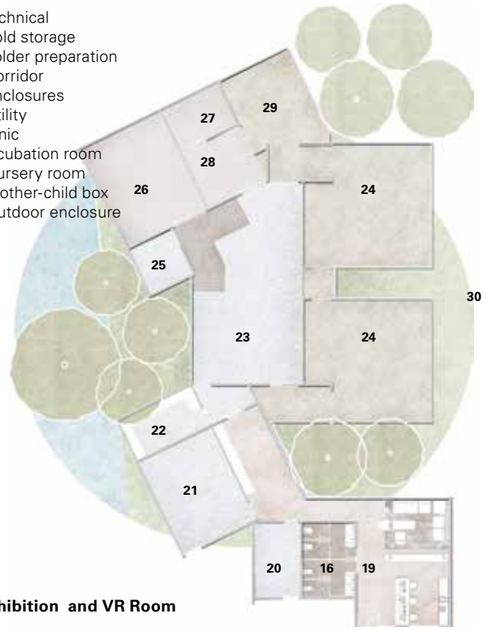


B: Exhibition and VR Room

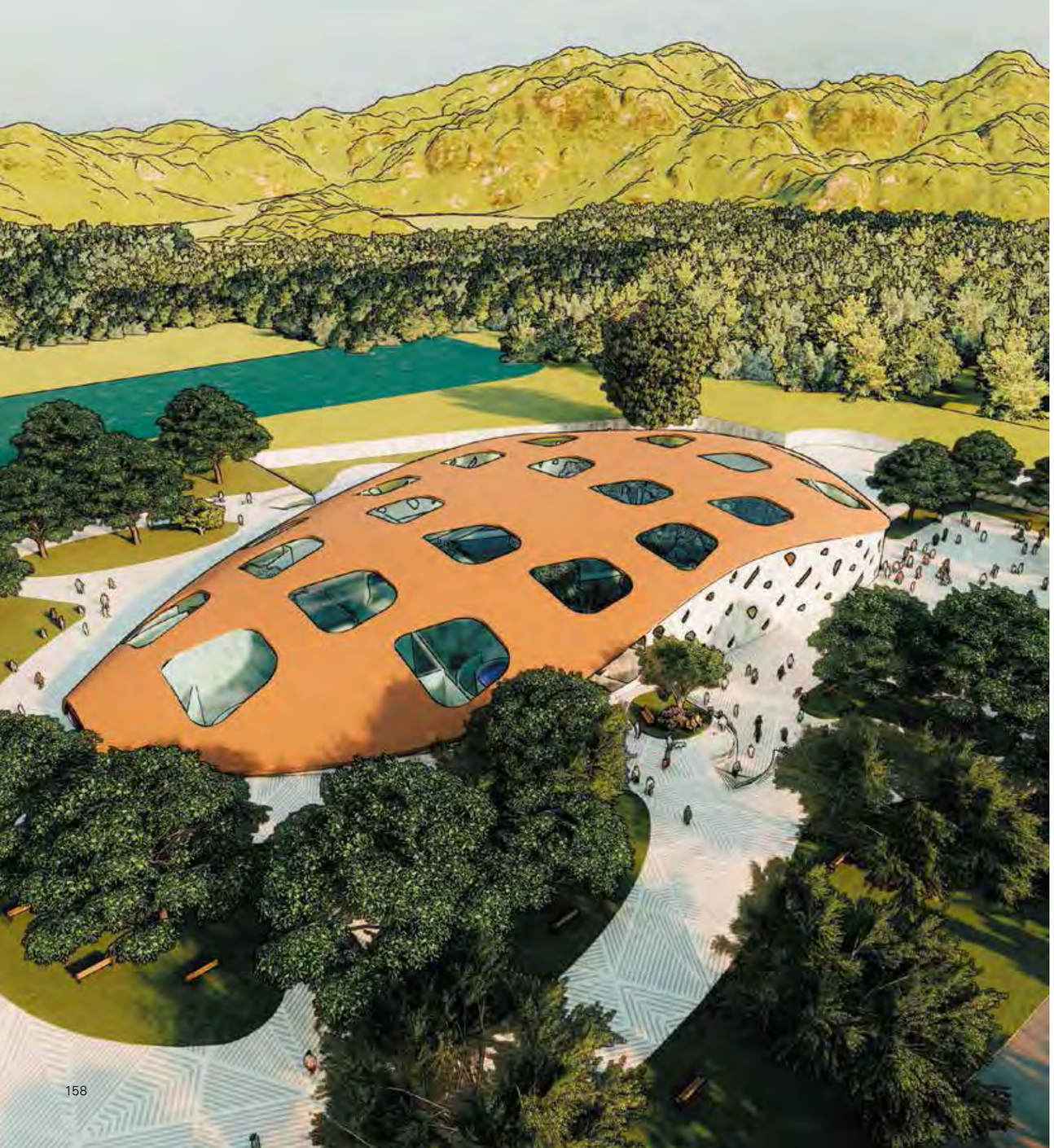
11. Reception
12. Dining
13. Semi-indoor dining
14. Kitchen
15. Cafe
16. Toilets
17. Tea house courtyard
18. Overwater bar
19. Office

C: Dining/Cafe/Tea House/Bar

20. Technical
21. Cold storage
22. Folder preparation
23. Corridor
24. Enclosures
25. Utility
26. Clinic
27. Incubation room
28. Nursery room
29. Mother-child box
30. Outdoor enclosure



D: Exhibition and VR Room



Connecting to Nature at the Zoo
How to Consider the Five Senses in Architecture

Jameel Trowers

Zoos, Heritage and Climate
This panda enclosure is designed for a site at Hope Zoo and Botanical Gardens, located in Kingston, Jamaica. This site was selected because of its historical heritage as well as the positive impact the enclosure may exert on the zoo and cityscape overall. The new building is multifunctional, combining a botanical garden with a learning path, exhibitions spaces and panda enclosures – the highlight of the overall experience. For economic reasons the structure extends below the ground-floor level, keeping the building climatised and establishing harmony with the surrounding environment.

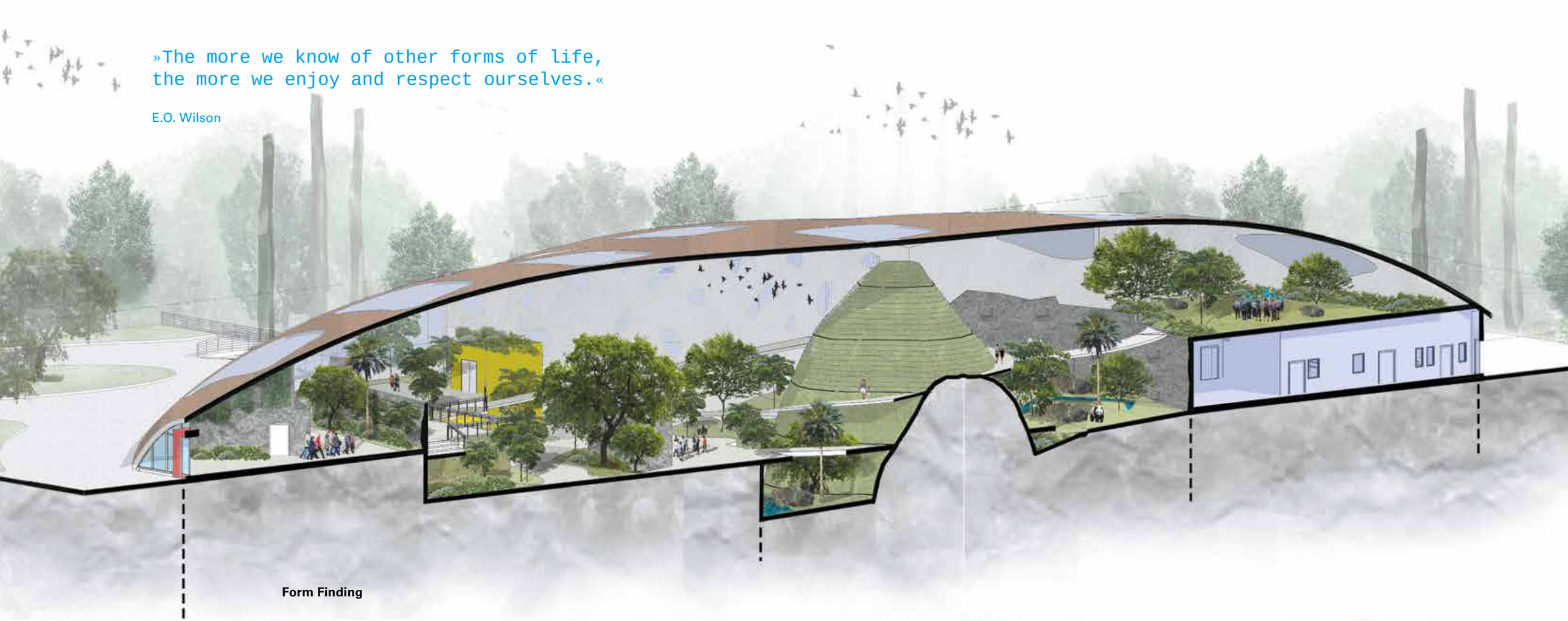
Senses and Learning
Good teaching needs good architecture. In its most extreme interpretation this thesis sits comfortably with the concept of »the environment as third pedagogue«. My design objective is to connect the visitor with nature through sensual architecture, since architecture is experienced predominantly through the atmosphere it creates. Landscapes in particular forge an atmospheric identity. In this design, landscape architecture supports the shaping of experience through the interplay between interior and exterior spaces. Modern technology supports exhibition scenery (e.g. holograms, special sound effects, etc.) as well as natural materials which represent the soft and cuddly »feel« of a panda.

Circulation and Interaction
Circulation is a characteristic form of movement. The interaction between the moving figure and the structural design is constitutive of the experience. Sightlines and pathways play an important role here. One may hear and smell around the corner, but is not able to see. Before finally being able to clasp eyes on the panda the goal is to activate the senses of visitors along different paths, to experience different spaces and first of all go grasp information. This enables visitors to be engaged and entertained before achieving the ultimate experience which is to witness the panda.

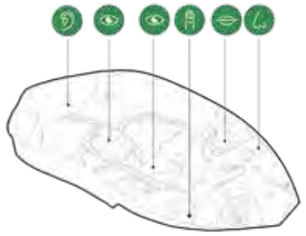
A Focus on Sustainability
Sustainability is a vital part of the design in order to create an environment and atmosphere promoting comfort for both pandas and visitors. Usage of materials, design techniques and energy consumption are considered to a great extent. The indoor botanical garden and panda enclosure emulate natural surroundings through the use of natural lighting created with translucent glass materials. The use of natural materials implemented within this design is illustrated by the wooden roofing to help deflect intense heat radiation from the sun. Materials incorporated within and on to the enclosure help to keep the building climatised for the pandas. The interior creates the most comfortable climate for pandas.

»The more we know of other forms of life,
the more we enjoy and respect ourselves.«

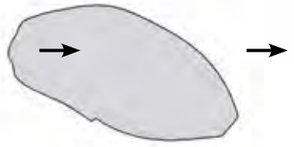
E.O. Wilson



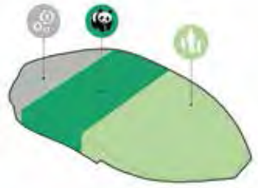
Form Finding



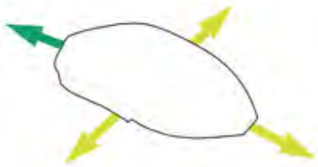
Bamboo leave



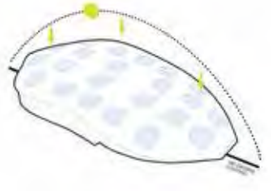
Massing



Functional program



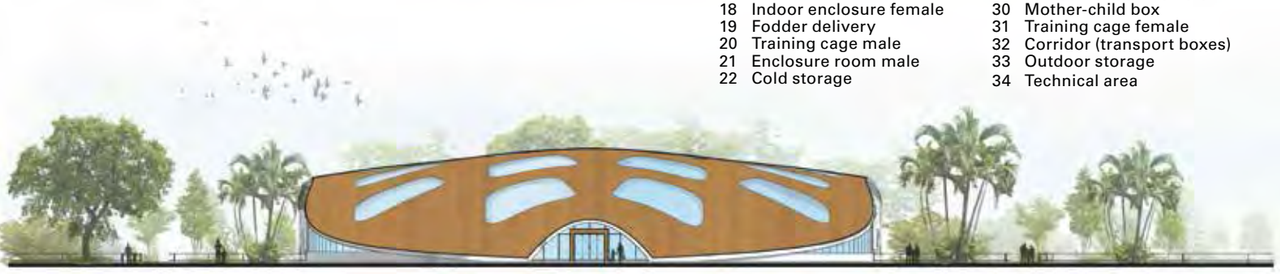
Public Keeper



Sun and Light

Ground level

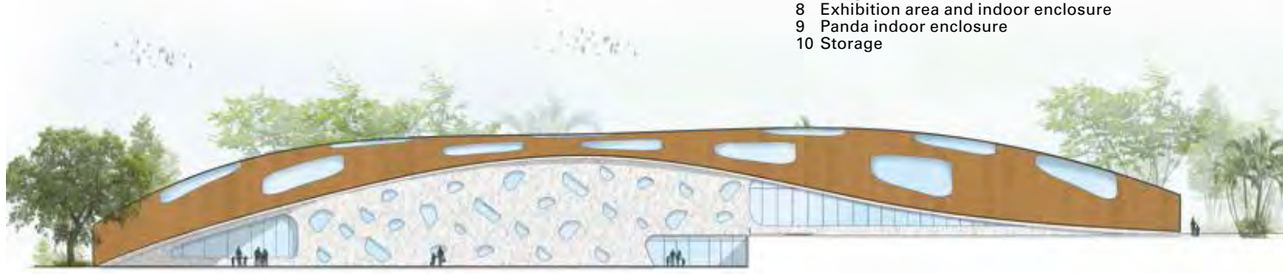
11 Education/Exhibition area
12 Café
13 VR-Cinema/Hologram room
14 Seating area
15 Indoor enclosure male
16 Enclosure female
17 Enclosure male
18 Indoor enclosure female
19 Fodder delivery
20 Training cage male
21 Enclosure room male
22 Cold storage
23 Fodder preparation
24 Zookeeper lounge
25 Unisex restroom
26 Zookeeper changing
27 Nursing area
28 Veterinary clinic
29 Enclosure room female
30 Mother-child box
31 Training cage female
32 Corridor (transport boxes)
33 Outdoor storage
34 Technical area



East elevation

First level

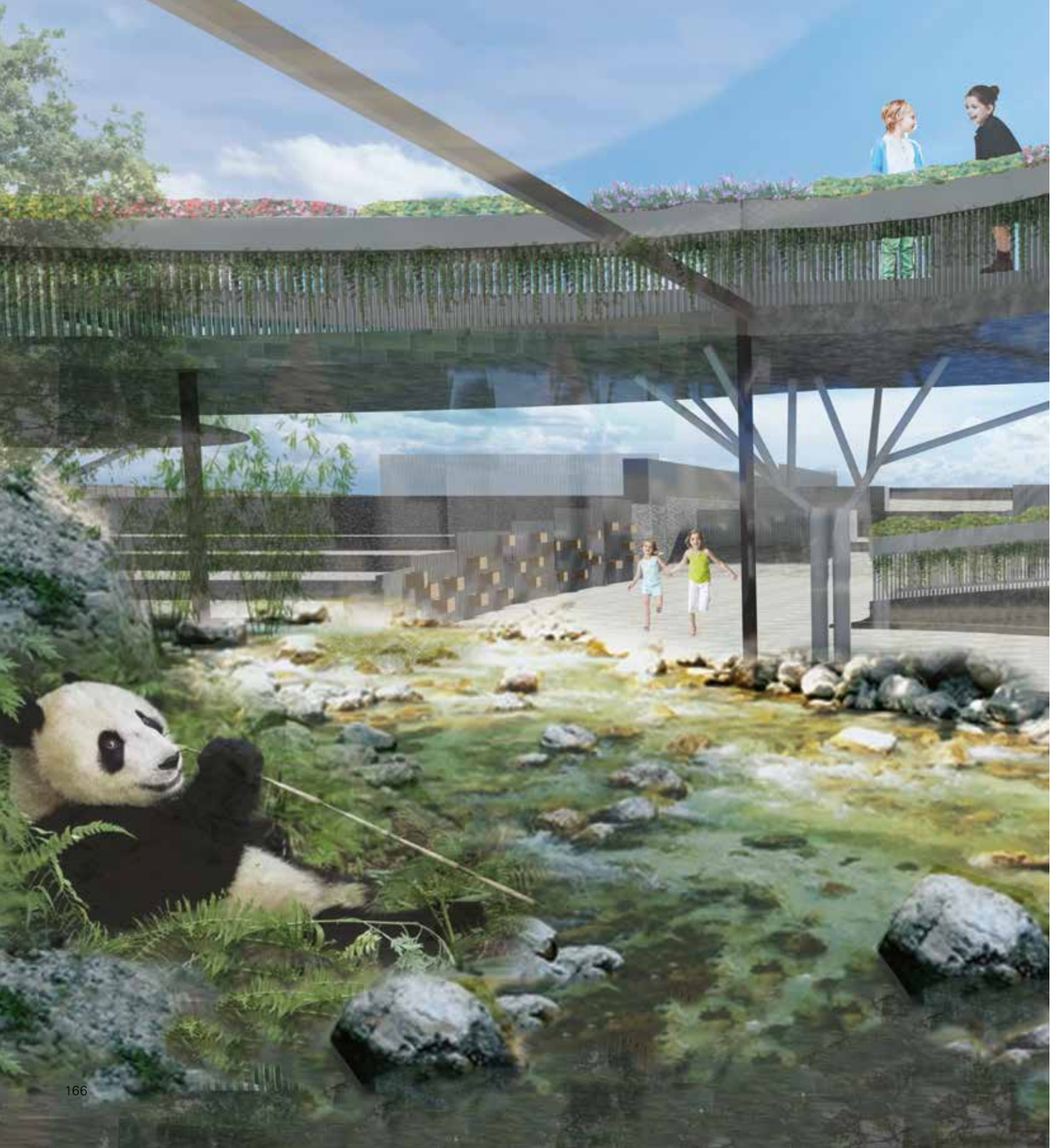
1 Waiting area and lounge
2 Reception office
3 Pathway to enclosure
4 Elevator
5 Restroom male
6 Restroom female
7 Bridge
8 Exhibition area and indoor enclosure
9 Panda indoor enclosure
10 Storage



South elevation

Senses and Learning

Good teaching needs good architecture. In its most extreme interpretation this thesis sits comfortably with the concept of »the environment as third pedagogue«. The design objective is to connect the visitor with nature through sensual architecture, since architecture is experienced predominantly through the atmosphere it creates. Landscapes in particular forge an atmospheric identity. In this design, landscape architecture supports the shaping of experience through the interplay between interior and exterior spaces. Modern technology supports exhibition scenery (e.g. holograms, special sound effects, etc.) as well as natural materials which represent the soft and cuddly »feel« of a panda.



A Panda House Flowing into a School

Architecture as a Catalyst Encouraging Children to Love the Earth

Chin Ai Ong

A Soothing Harmony between Architecture and the Natural Environment

Located in Taiping, Malaysia, this project is designed to blend into its surroundings and flow as an ideological concept. At the heart of Taiping Zoo and Taiping Lake Gardens, it comprises a permeable loop with two very generous gateways capable of absorbing pedestrian flow. This initiative enables children to view the panda as a learning figurehead, gain access to own-grown healthy foods through an aquaponic system as well as to engage in educational opportunities presented by outdoor learning environments.

A Fluid and Permeable Architecture which Embraces Outdoor Learning

The routes from both access points are envisioned as a »place full of magic – a playful escape for children that is a symbol of freedom and endless imagination.« By lifting the earth at both entrances, an undulating green spiral at the heart of the site affords direct views into the pandas' habitats.

A Fusion of Nature and Technology

Drawing inspiration from the form of tree branches, the ramp is supported by white steel tree-like structures. These 'columns' support all loads bearing upon the branches which are then conveyed to the trunk and then beneath to the foundation. The ramp is enveloped in steel, painted white so as to enhance its beauty. The walls are designed in in-situ concrete with bamboo formwork, inspired by the panda's favourite food. Virtual reality is harnessed to create a living and breathing environment so that children experience the reality of deforestation. The screen is no longer merely placed in front, but rather stretches all around, reinforcing the reality of the situation that the earth is facing.

Legend

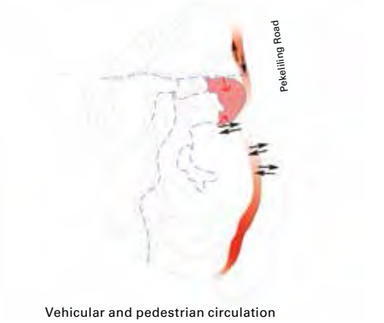
1 Outdoor Enclosure for Males
2 Indoor Enclosure for Males
3 Outdoor Enclosure for Females
4 Indoor Enclosure for Females
5 Visitors Platform with Aquaponic System and Edible Garden
6 Enclosure for Females
7 Training Cage for Females
8 Mother-Child Box
9 Training Cage for Males
10 Enclosure for Males
11 Weighing Area
12 Fodder Preparation Area
13 Fodder Delivery Area
14 Veterinary Clinic
15 Nursing Area
16 Technical Area/Office
17 Zookeeper Lounge Area/Changing Area
18 Cold Storage for Bamboo/Fodder
19 Bamboo Storage Area (Waste)
20 Pandas Loading Space
21 Loading Bay
22 VR Space
23 VR Room
24 Permeable Loop Garden

Site Analysis - Neighbourhood Context

Existing and proposed zone

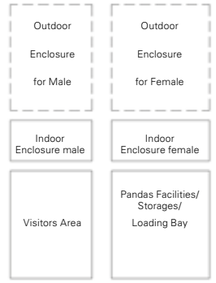
Points of attractions

Views

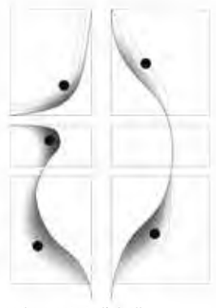


Vehicular and pedestrian circulation

Concept Diagrams



Boxed form acts as education hub for children.

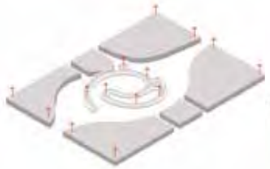


Motion paths create to link all focal points of the spaces.

From Taiping Lake Gardens | Visitors Platform with Aquaponic System & Edible Garden | Indoor Enclosure for Pandas / Permeable Loop Garden - Gathering and Education Area

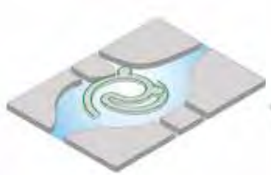
Visitors Platform with Aquaponic System & Edible Garden | From Taiping Zoo

Site Analysis – Neighbourhood Context



Generates pedestrian flows and activities by creating different levels.

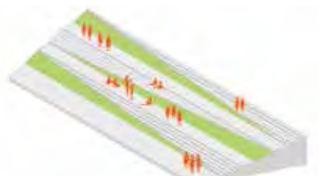
Responsive to visionary and external site conditions.



Flow of energy creates volumetric hollow; Green spiral ramp as pedestrian friendly learning environment.

Loop of movement as a route and spatial element.

Permeable Loop Garden



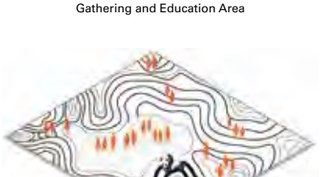
Amphitheatre

Grow and Learn with Pandas

Gathering and Education Area

Virtual Room - Reality

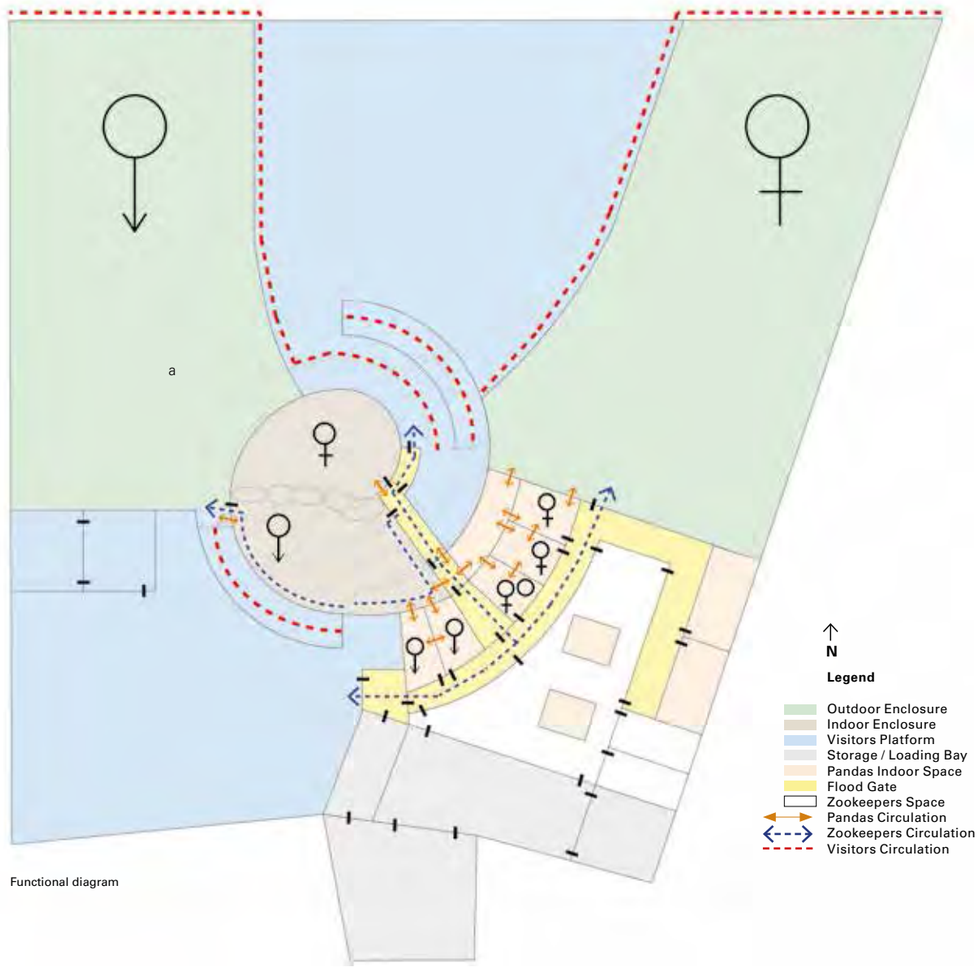
Indoor Panda Spaces Responsive to Tropical Climate



Virtual Space - Movement

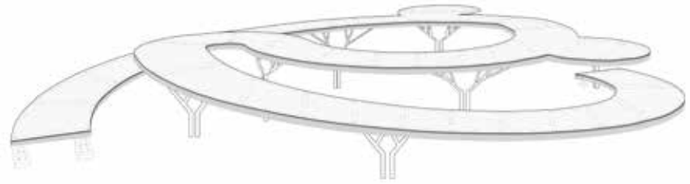
Seamlessly Blend with Nature

Outdoor Spaces for Pandas



Functional diagram

Spiral ramp



A soothing harmony between architecture and the natural environment, as well as children and pandas.

Visitors platform with aquaponic system and own-grown healthy food garden.

Aerial view of proposed Panda House.

An undulating green spiral ramp at the heart of the site affords views into the pandas' habitat.

The Civilized Panda
Citizen Harmony with Nature

Gouda Shehata

In Harmony with Nature
What happens if we were to encounter animals on a daily basis? Most zoos make a strong distinction between humans and animals through the creation of separate spaces, although humans may interact with animals within a restricted capacity as visitors. I believe that the establishment of a genuine harmony between humans and animals requires a different perspective of space. The target of this project is therefore to demonstrate a new type of zoo as a place which fosters interaction on a daily basis.

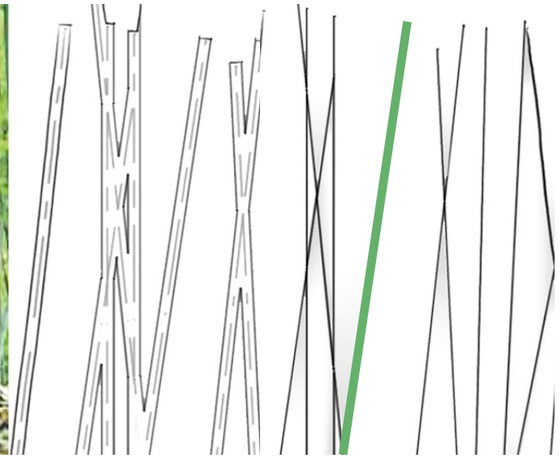
How will this Pathway be Efficient
The pathway needed to preferably be located in a busy setting with great transportation links in order to encourage a high rate of daily interaction. Alexanderplatz was therefore chosen as one of the most crowded piazzas in Berlin, located at the heart of the city. It also features the train station of Alexanderplatz. Animals demand special requirements for an appropriate environment – one of the most important being nature. The green pathway on Alexanderplatz will therefore lend a dynamic contrast.

How to Implant the Zoo into Daily Life
Much of human history has been written in terms of an ongoing struggle of »man against nature«. I needed to align the pattern of people's movements with animal zones. Instead of viewing the animal zone as a single focal interaction point, it may be implemented across several urban attractions. Humans are continuously absorbed by their daily repeated activities, spending a great deal of time travelling. This zoo therefore may similarly act as a pathway for pedestrians.

The Impact of Form
This project is intended to lend a new palpable atmosphere of greenery to Alexanderplatz, although forms have been produced so as to respect its architectural style. This is demonstrated by a green urbanistic pathway from the edge of Alexanderplatz towards the TV Tower and a supporting pathway from the centre of the platform to the main pathway, respecting the nineteenth-century *Neptunbrunnen* (Neptune Fountain). Slopes are oriented towards the main attractions.

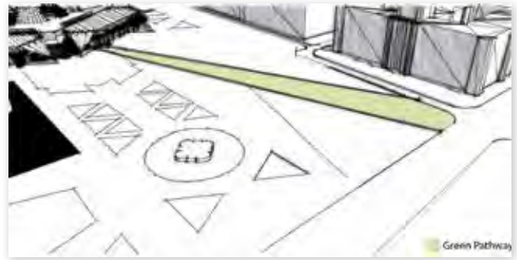
Design Concept

This project intends to present nature in a bold fashion – not only by implanting animals into a civilian environment, but also creating a strong natural setting at the heart of the city. Green slopes give rise to a grassy valley in between forms. The outdoor cladding of all structures is dry bamboo arranged in a vertical fashion – its brown hues evoking soil. Bamboo is the main food source of the giant panda and is extremely important for both captive and wild pandas. Regarding the strength structure of bamboo, the bamboo kept in a verticality way with a slight warp. The variety of bamboos' angles makes a special overlapping environment. An image of overlapping bamboo took as visual features study. The visual abstraction showing an intersections regarding vertical warps. Shapes created as a result of sharp and loose angels of vertical intersections.

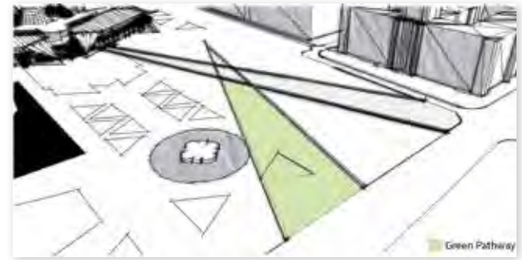


Linearity and intersection

Generation of Form

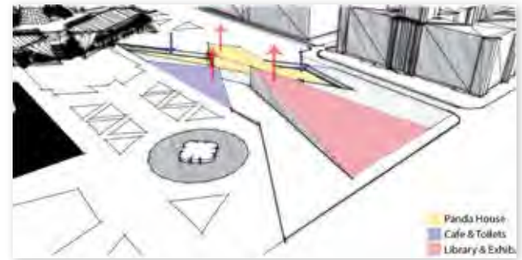


The form generation started by a green urbanistic pathway from the edge of Alexanderplatz towards the TV Tower. The pathway meant to be straight to fulfill its main function.

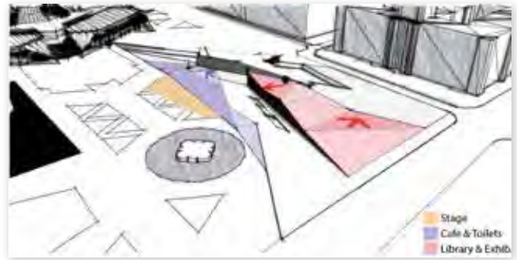


Supporting pathway from the center of the platform to the main pathway. The gridlines drawn with specific sharp angels reflecting the *Linearity and Intersection* concept.

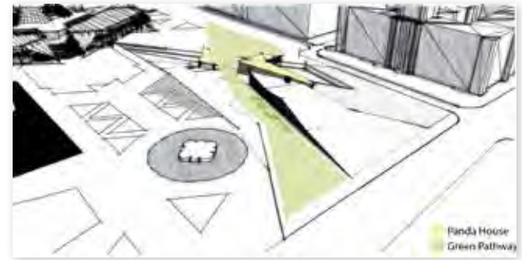
The spaces involved as a result of the grid intersections. Creating the functional zones and respecting the nineteenth-century *Neptunbrunnen*.



The form meant to show harmony with the earth by creating green slopes. The outdoor enclosure of pandas elevated down for better visuality access.

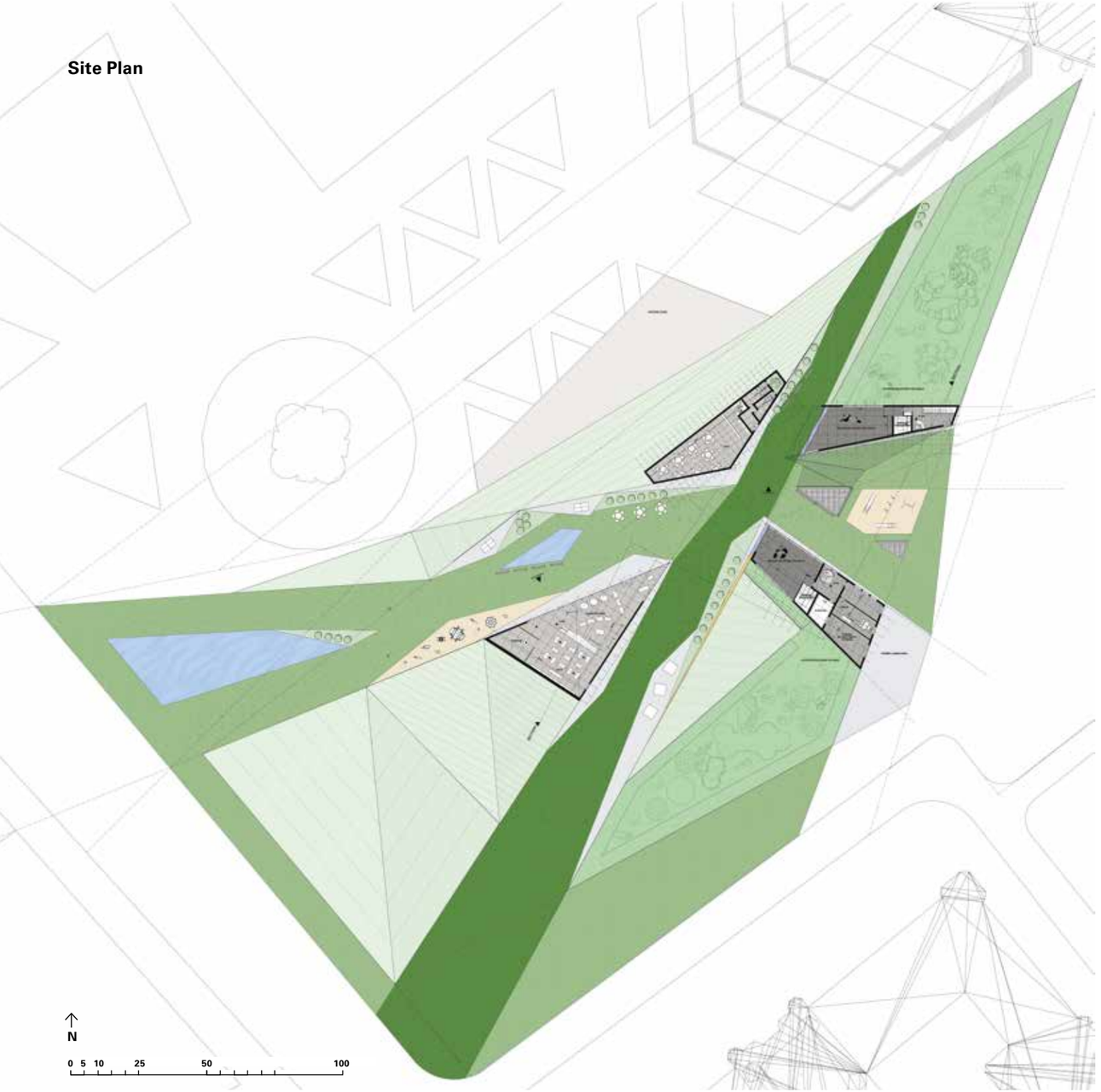


Slopes are oriented towards the main attractions, e.g. the Rotes Rathaus ("Red City Hall") and the Marienkirche ("St. Mary's Church"), in order to enhance views.



For more accessibility, Sector of the Panda's house embedded on the earth. Allowing more connection to *Rotes Rathaus* shopping center and the surrounding area.

Site Plan


N
0 5 10 25 50 100


Panda male
Panda female
Zookeepers area
Clinic and Nursing
Vertical circulation
FEMALE OUTDOOR ENCLOSURE
FEMALE ENCLOSURE
INTERMEDIATE SPACE
ZOOKEEPER LOUNGE
MOTHER CHILD BOX
CHANGING ROOM
SHOWER
FEMALE TRAINING CAGE
ENCLOSURE ZOOKEEPERS ONLY
ELEVATION 1
MALE TRAINING CAGE
VETERINARY CLINIC
MALE ENCLOSURE
NURSING AREA
FODDER WASTE STORAGE
FODDER COLD STORAGE
ELEVATOR
FODDER PREPARATION AREA
MALE OUTDOOR ENCLOSURE

Elevation

Section

Your Neighbour the Panda
Perhaps You Have Someone Living Near You that Seems Creepy

Paul Schwarz

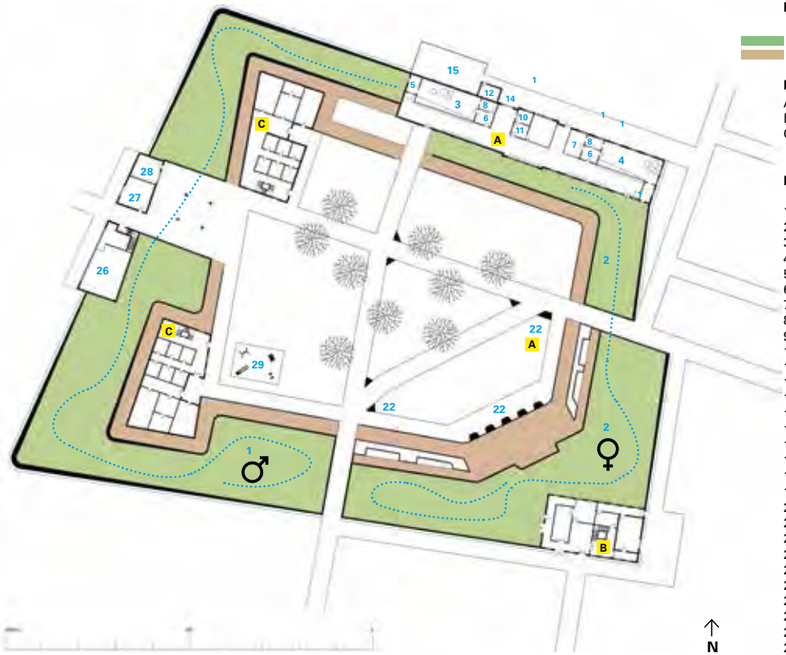
Left: Lené-Voigt-Park in Leipzig, Germany

CoeXity is a project that forwards the idea of, as the name implies, coexisting with animals of all shapes, sizes and origins. The panda, as a naturally laid-back member of the Ursidae family, is to serve as an example of how this idea can be integrated into already existing structures like cities, parks and zoos.

Urban Context
This enclosure is not only located in a park near the center of the city of Leipzig, but is also a miniature city in itself. The structure and its buildings are aligned with the axes of the already existing buildings and pathways. The enclosure creates a ring that puts emphasis on the park area between it. Its location is convenient enough for visitors who do not have to go out of their way to access it, while providing an unusual experience for first-time tourists. One of the project's ultimate goals is to heighten the overall quality of the *Lene-Voigt-Park* which has been neglected by the city for a long time.

Regional Influences
The core message of the project is to create a permanent, timeless and unobtrusive structure that establishes a natural habitat for animals and humans. Despite originating from China, the panda enclosure does not rely on stereotypical and striking design choices. The aim is to lend common architectural elements to the panda and vice versa; the animals wouldn't care much for Buddhist temples anyway! The panda has everything it needs to live a healthy and carefree lifestyle within a regional-oriented design, instead of presenting the animal as something extraordinary.

Form Factor
The Panda enclosure incorporates slopes and curves to make the terrain as independent and stimulating as possible, while still providing realistic opportunities for the panda to play and move around. The pathways follow the general structure of the park, breaking out every so often to create resting spaces for visitors. From an outside perspective the enclosure presents itself as a somewhat sculptural object. The existing and new animal facilities bridge a gap by combining the form of the animal enclosure with the general aesthetics of the existing buildings.



Height development terrain

0.00 bis 4.0 m

Building parts

A: Panda Enclosure
B: Veteninary Clinic
C: Public Housing

Legend

1 Outdoor Enclosure (Male)
2 Outdoor Enclosure (Female)
3 Indoor Enclosure (Male)
4 Indoor Enclosure (Female)
5 Intermediate Space
6 Enclosure – Entry for Zookeepers
7 Mother-Child Box
8 Training Cage
9 Nursing Area
10 Fodder Delivery Area
11 Fodder Preperaton Area
12 Technical Area
13 Cold Storage for Fodder
14 Loading Bay
15 Bamboo Storage (waste)
16 Zookeeper Lounge
17 Operating Room
18 Examination Room
19 Waiting Room
20 Consultation Room
21 Restroom
22 Educational Totems
23 VR-Cinema
24 Seating Area
25 Café
26 Store
27 Storage (Store)
28 Toolshed (Facility Manager)
29 Playground

N

History

From the time of its completion in 1874, the approximately 11-hectare site cut a veritable swath through the residential and factory blocks of eastern Leipzig, which were built almost simultaneously. After the construction of the central station, passenger traffic was largely relocated there in 1915. In 1942, operations at the *Eilenburger Bahnhof* were completely discontinued and the site was largely neglected as a wasteland. What remained was an area about 800 metres long and 80 to 130 metres wide in a prominent location near the city centre.

In 2001, parts of the district park were opened and in 2004 the entire park was completed and handed over to the public. The park offers a wide range of leisure and recreational opportunities for young and old. In the northern part there is a band with sponsorship plots fouse by residents or local associations. Like the former railway line, the new Panda enclosure is intended to convey a sense of width and openness. The new enclosure is an example of how *Building for Animals* can be integrated into already existing urban structures.

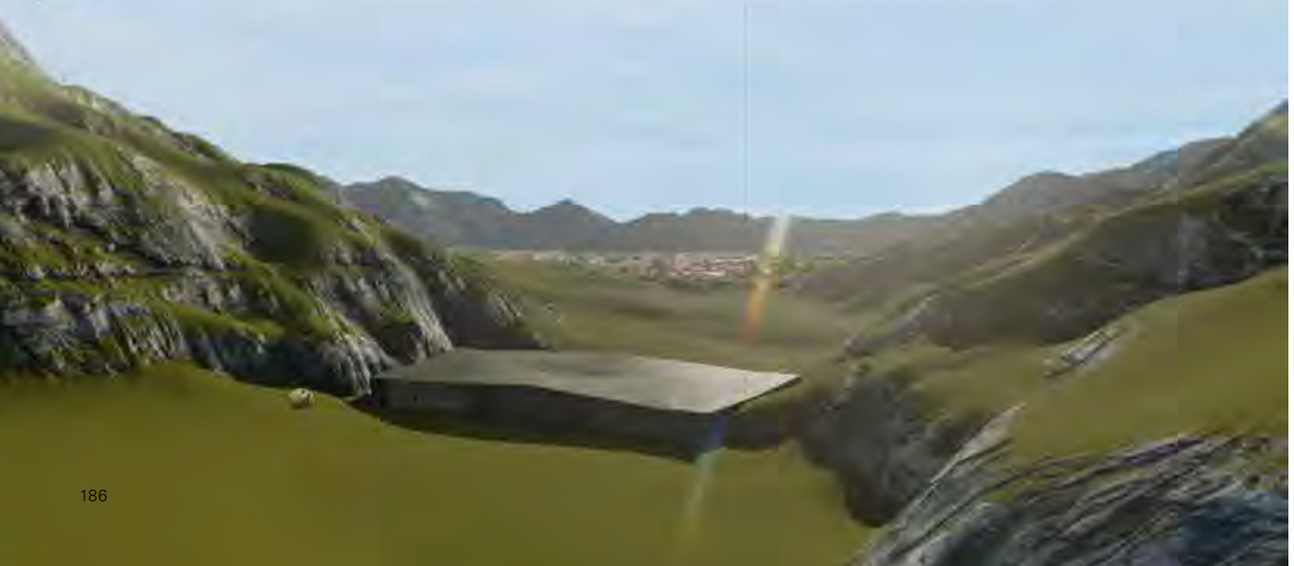
Design Idea: Your neighbour the Panda

Visitor viewing on different levels

Site plan (scale 1:2000)

Mountains Setting the Scene
The design consists of three different spaces: the facility building, the outdoor enclosure, and the visitors' platform. The mountain scenery acts as an impressive natural panoramic setting, whereas the facility building sits in the valley, forming an architectural boundary. Landscaping the architecture is achieved through glass and natural stone (roughly hued rock) and a walk-on green roof that can easily be traversed from one end to the other. Visitors' platforms are located high in the mountains at different spots, so that people can look down into the valley from different vantage points.

Architecture Providing Shelter
Visitors' buildings consist of individual modules grouped around each other, facing different directions and at different angles to each other. The main visitors' building has a small café, a cinema, balconies and observation halls. The smaller visitors' facilities mainly contain observation halls and platforms.
All buildings are connected by an existing hiking path which will be enlarged and further developed, connecting the enclosure.
Within the outdoor enclosure a walking path leads from the roof of the keeper's building to the hiking trail in the mountains, dividing the outdoor enclosure into a male and female panda enclosure.



UNZOO
Why We Should Place Visitors Behind the Glass

Isabelle Wuttke

Animal Rights
Animal rights are important and we need to respect them, especially in zoos. In the twenty-first century animals have finally become respected beings – at least in some parts of the world. The quality of zoo architecture therefore needs to reflect this shift too.

Climate and Conditions
In the wilderness mighty pandas live in subtropical mountainous areas containing dense forest. In summer there is quite a cool climate, whereas in winter it is cold. Generally speaking such areas are humid and experience high rainfall. These requirements are thus taken into account in my design.

Modules and Vistas
For my design I pursued three core ideas: a high degree of natural habitat; visitor areas and platforms designed as modular and mobile elements, and visitors positioned behind the glass instead of animals. Integrating architecture into the landscape is integral to achieving this goal.

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Floor plans
(scale 1:250)

Ground floor

Level -01

Level -02

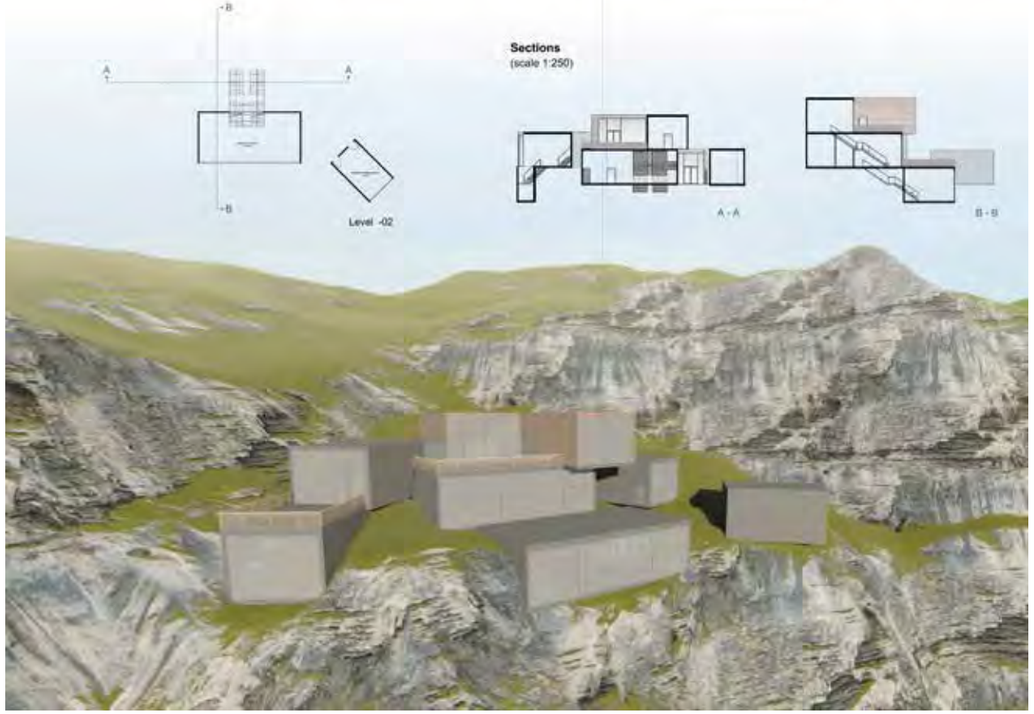
Isometric drawing

View
(scale 1:250)

Sections
(scale 1:250)

A - A

B - B



Floor plans
(scale 1:200)

Ground floor

Level -01

Isometric drawing

Ground floor

+ 5.00m

Level - 01

Sections
(scale 1:200)

A - A

B - B

View
(scale 1:200)

Design references

Exterior

Interior

Material board

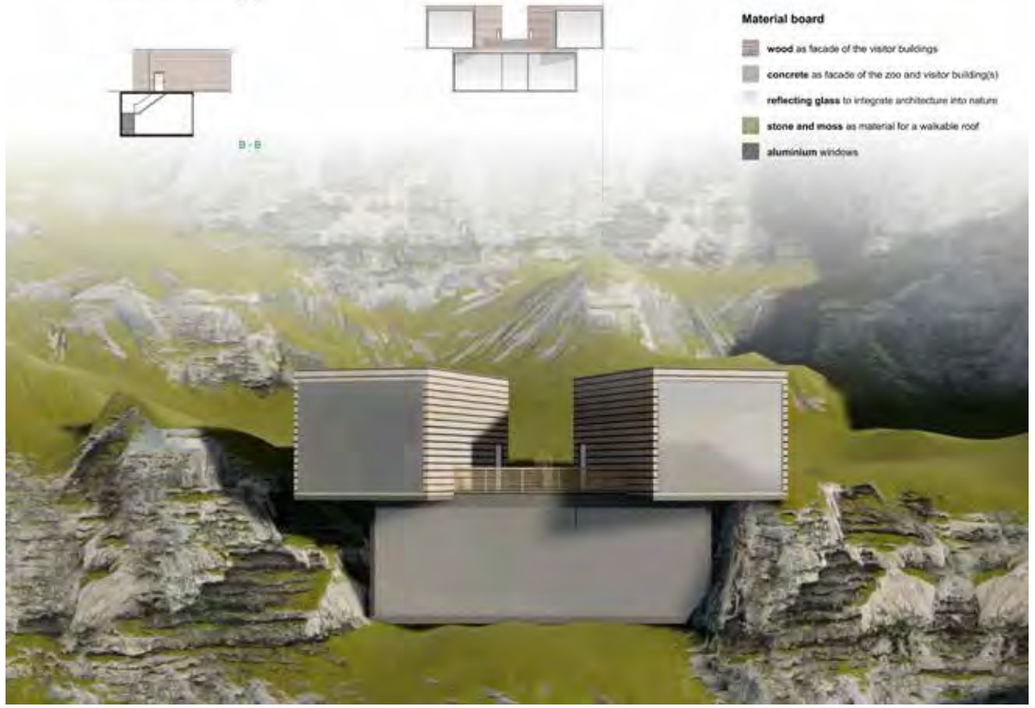
wood as facade of the visitor buildings

concrete as facade of the zoo and visitor building(s)

reflecting glass to integrate architecture into nature

stone and moss as material for a walkable roof

aluminium windows



PANDADISE
From a Compound to a Living Space

Sandra Misselwitz

Landscaping the Architecture
The concept here is to build two striking mountains, involving the landscaping of buildings. The design is therefore reminiscent of a Chinese landscape. The tip of the artificial cliffs – the great rocks 30 and 25 metres high – rise majestically above the treetops. The objective is to design an exhibit in which visitors share the same landscape (albeit not the same area) as the animals. Two separate enclosures for the pandas are located at the foot of the mountains. The enclosures provide an enriching natural behavioural setting. Even though visitors may not have the chance to view the animals up close, the landscape as a whole forms part of the design.

Inside and Outside
The cement shell, which is planted with greenery on the outside, is supported by a grating made from bamboo framework. Eco-friendly and renewable materials – such as lime-sand brick – are also used. A self-supporting crystal-like »cave« is established inside the rock which visitors can climb via intertwined paths. On a surface of 40.000 square metres, comprising 21 rooms on six levels, pandas are presented interactively through live animal demonstrations and informative games.

Insight and Perspective
Intense viewpoints enable observation from hidden locations on different levels within the structure – from the tunnel and the paths to the observation terrace within increasingly exposed settings due to the widening of the space under observation. Visitors enter the building through a tunnel system. The spiral thematic path featuring platforms guides them, packed with experiences under the motto: »Explore the world of the great panda.« A bridge connects the two mountains and affords a panoramic view of the panda enclosures and the landscape.

A Bridge to Nature
Why Visitors Should Stand on Stage

Andrea Ramos Lopez

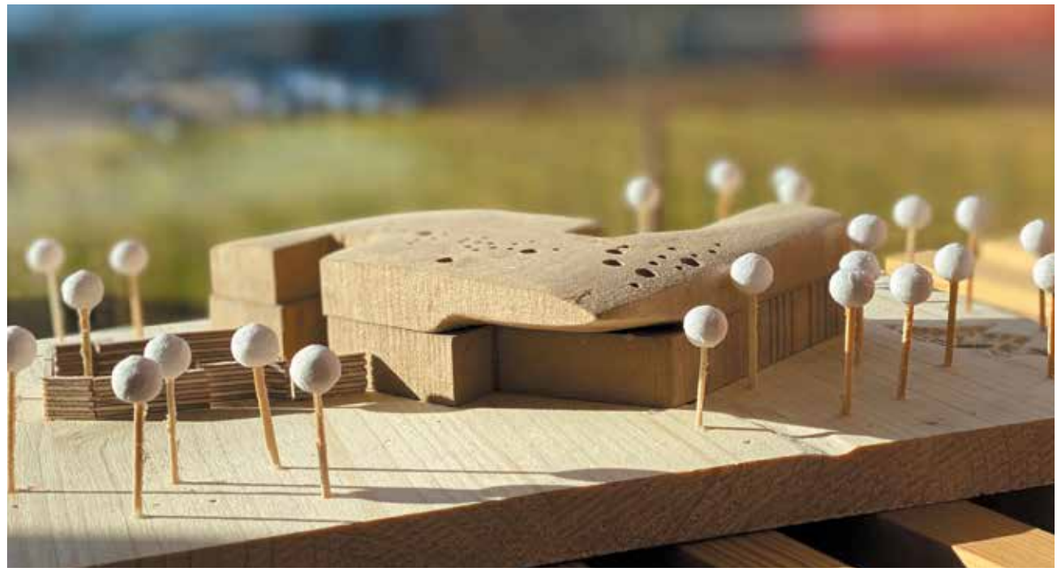
Over the past few years zoos and enclosures have changed regarding their design parameters and goals, including whom they ultimately serve. Is a zoo designed for humans or for animals? From the outset, this design process therefore takes into account people and animals and their role in an animal enclosure.

The site, located very close to a chain of mountains, provides natural barriers and simulates the pandas' natural habitat. As with all spatially malleable objects, the view from a single vantage point is not sufficient to capture a complete snapshot, but rather must be supplemented with a series of viewpoints from different positions. My design achieves this through an elevated and elongated bridge with different sojourn qualities. Guided tours capture changing moods, expectations and illusions.

The panda enclosure has three main areas: a visitor's area, the zookeeper's area and enclosure areas, incorporating both the outdoors and the indoors. The building as a whole has a very sober style, featuring concrete on the exterior.

Appendix

Models (Selection)

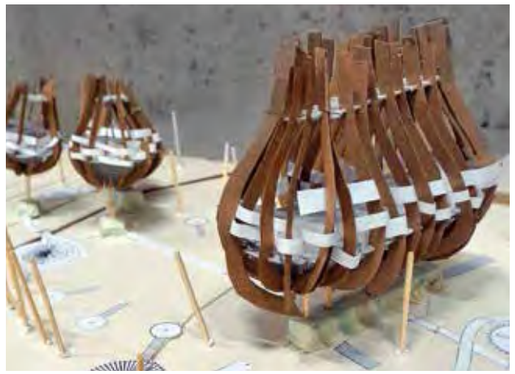


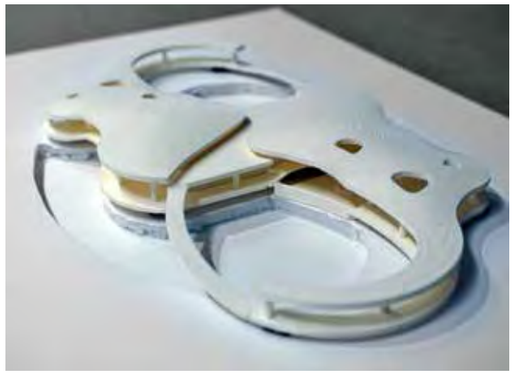
1

2

1 Anotidaishe Mavazhe
2 Shaun Yong
3 Martin Hundeshagen
4 Nurin Abdullah
5/6 Mehmet Caferoglu
7 Eddie Goh
8 Anna Thum

Links: Natascha Meuser
Rechts: Martin Hundeshagen

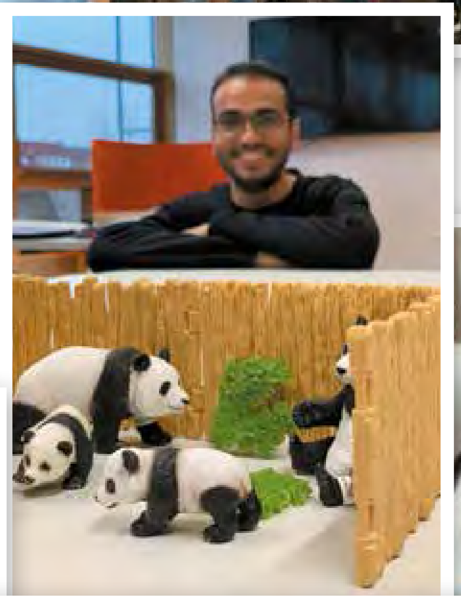
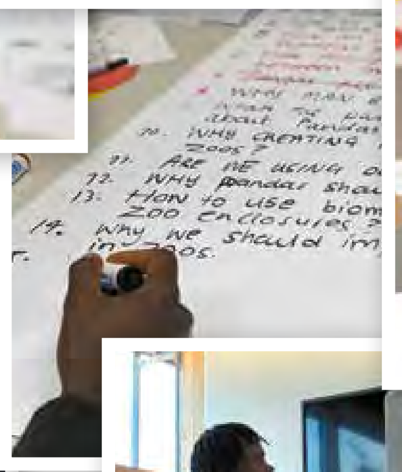




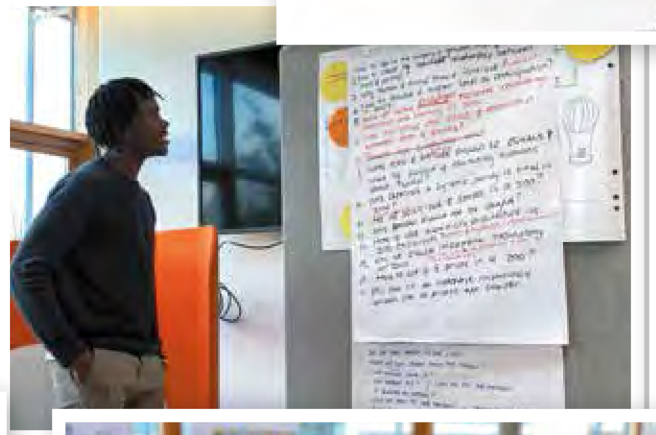


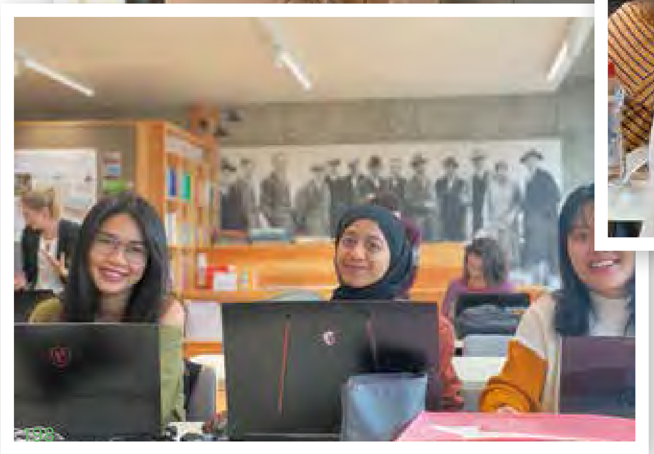
JIAO
QING

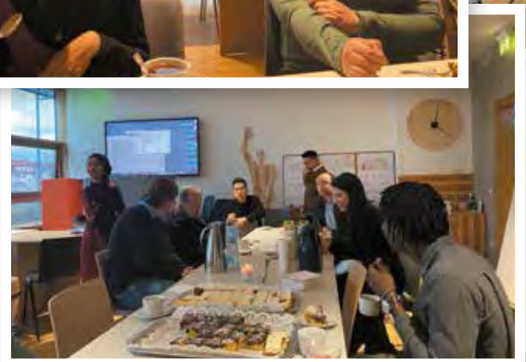








Acronyms and Abbreviations

ARKS	Animal Records Keeping System
ASZK	Australasian Association of Zoo Keepers
Awin	Animal welfare indicators
AZA	Association of Zoos and Aquariums
BIAZA	British and Irish Association of Zoos and Aquariums
CBD	Convention on Biological Diversity
CBSG	Conservation Breeding Specialist Group (IUCN)
CEC	Commission on Education and Communication (IUCN)
CEPA	Communication, Education and Public Awareness (IUCN)
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
DAISIE	Delivering Alien Invasive Species Inventories for Europe
DEFRA	Department for Environment, Food and Rural Affairs (UK)
EAAM	European Association for Aquatic Mammals
EARS	European Alliance of Rescue Centres and Sanctuaries
EAZA	European Association of Zoos and Aquaria
EAZWV	European Association of Zoo and Wildlife Veterinarians
EEP	European Endangered Species Programme (EAZA)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FSC	Forest Stewardship Council
GFAS	Global Federation of Animal Sanctuaries
IAS	Invasive Alien Species
ICP	Institutional Collection Plan
ICZ	International Congress of Zookeepers
IPM	Integrative Pest Management
ISB	International Studbooks
ISIS	International Species Information System
IUCN	International Union for the Conservation of Nature
IZE	International Zoo Educators Association
MSC	Marine Stewardship Council
NGO	Non-governmental organisation
OIE	World Organisation for Animal Health
SCA	Special Conservation Areas
SEAL	Social and Emotional Aspects of Learning
SSC	Species Survival Commission (IUCN)
SSP	Species Survival Programs (AZA)
STB	Studbook
TAG	Taxon Advisory Group
WAZA	World Association of Zoos and Aquariums
WCS	Wildlife Conservation Society
WZACS	The World Zoo and Aquarium Conservation Strategy
ZIMS	Zoological Information Management System
Zoos Directive	Council Directive 1999/22/EC
ZSL	Zoological Society of London

Bibliography

Adorno, Theodor W.: Minima Moralia. Reflexionen aus dem beschädigten Leben, Frankfurt am Main 2001

Brägger, Kurt / Geigy, Rudolf / Lang, Ernst M. / Studer, Peter / Wackernagel, Hans: 100 Jahre Zoologischer Garten Basel 1874–1974, Basel 1974

Darwin, Charles: On the Origin of Species by Means of Natural Selection, or The Preservation of Favoured Races in the Struggle for Life, London 1859

Guillery, Peter: The Buildings of London Zoo, London 1993

Hediger, Heini: Zur Entstehungsgeschichte der Zoologischen Gärten, in: Wildtiere in Gefangenschaft, Special edition of the Ciba journal, issue 54 / 1938, p. 1876–1881

Hediger, Heini: Der Zoologische Garten als Asyl und Forschungsstätte, Basel 1948

Hediger, Heini: Mensch und Tier im Zoo: Tiergarten-Biologie, Zurich / Stuttgart / Vienna 1965

Heinsdorff, Hellmut: Bauten und Anlagen Zoologischer Gärten. Baugeschichtlicher Rückblick, Typenentwicklung und Aufgabenstellung für den Architects (diss.), Munich 1968

Kühn, Alfred: Grundriß der General Informationen Zoologie. Leipzig 1922

Meuser, Natascha: Zwischen Bühnenbild und Gefängnisbau. Vom Fehlen einer Debatte über Contemporary Zoo Buildings – eine Skizze, in: ModulØr, issue 2 / 2013, p. 22–28

Loisel, Gustave Antoine Armand: Histoire des Ménageries de l'Antiquité à nos jours (en 3 volumes), Paris 1912

Reiterer, Gabriele: Die Biologie des Bauens. Wie Charles Darwin die Baukunst beeinflusste: Hinweise auf eine Evolutionstheorie der Architektur, in: Die Presse (Spectrum) on 28 February 2009

Rossi, Aldo: Die Architecture der Stadt. Skizze zu einer grundlegenden Theorie des Urbanen, Düsseldorf 1973

Precht, Richard David: Noahs Erbe. Vom Recht der Tiere und den Grenzen des Menschen, Reinbek bei Hamburg 2000

Schmarsow, August: Das Wesen der architektonischen Schöpfung, Leipzig 1894

Semper, Gottfried: Die vier Elemente der Baukunst. Ein Beitrag zur vergleichenden Baukunde, Braunschweig 1851

The World Association of Zoos and Aquariums (WAZA) adopted in 1993 the first World Conservation Strategy, setting standards and guidelines for zoos and aquariums worldwide

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