INTERNATIONAL SUMMER SCHOOL

31.08.–08.09.2024

WOOD AND THE CITY

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Wood and the City
ZHAW Summer School 2024
Final Report

Organized by

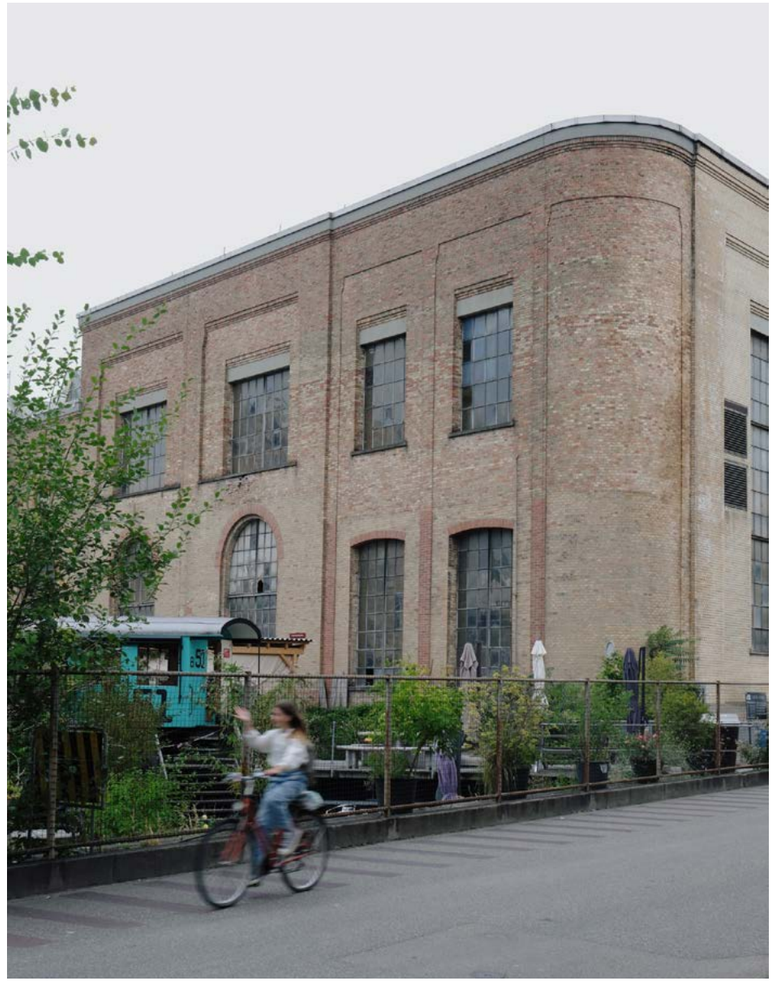
Architektur, Gestaltung und Bauingenieurwesen

Institut Urban Landscape

Co-organizers

Thomas Hildebrand
Celina Martinez-Cañavate
Carla Ferrer

ZHAW Summer School 2024



1 ZHAW Summer School 2024 on the Sulzer-Areal in Winterthur

2 Student work final presentations
3 The “Wood and the City” co-organizers, f.l.t.r Carla Ferrer, Celina Martinez-C. and Thomas Hildebrand

Preface
Towards a culture of “Care & Repair”

The “Wood and the City” Co-organizers
Thomas Hildebrand, Celina Martinez-C., Carla Ferrer

The current economic system, with its emphasis on innovation, growth, and progress, driven by a logic of consumption, exploitation, and waste, has led to reckless exploitation of both people and nature. Architecture plays no small part in this, as evidenced by statistics on greenhouse gas emissions and construction and demolition waste. The building sector is one of the focal points for measures of action. Globally, construction and building management contributes roughly a third to carbon emission and energy demand and about half to the consumption of raw and processed materials. Making the built environment more sustainable is therefore of the greatest importance.

The future of our cities and urban landscapes lies in infrastructure, streets, and buildings that already exist in their vast majority. It is therefore essential that now and, in the future, the entire building sector makes a wholehearted and decisive move towards the era of “re”: reduce the need for raw material and energy, repair structures, recycle materials, reuse buildings and their parts and with it rethink our relation to “nature” as well as repair social inequalities.

The necessity of the much-discussed system change in the construction industry is undeniable an it implies the use of more sustainable materials in the future. In this concern, wood – or timber – is one of the most promising resources of the future. It is not wrong to speak of a true renaissance of this material: with its naturally low carbon footprint and impressive physical properties, it opens a powerful way towards a resilient construction practice. However, its efficacy depends on several important factors, such as a judicious and knowledgeable use on the part of both designers and constructors and a responsible, holistic building management which thinks in (life) cycles, and a biologically sound forest management.

As a society, we all must explore ways to individually contribute to reversing the trend of global warming and adapt to changing conditions in our biological and social ecosystems. Engaging with existing building stock is one of many responses, necessitating a reassessment of the role of architects and other professionals in the field. Together, we must work towards a resilient culture of “Care & Repair” in architecture.

During the 8 days program of the 2024 International Summer School WOOD AND THE CITY of ZHAW School of Architecture Design and Civil Engineering we have explored the concept of design for “Care & Repair”. We have looked look at how to use and reuse wood and other bio-based construction materials by simultaneously looking back and forward in time. Aiming the Swiss Open-air Museum Ballenberg as site for explotarion, the analysis of past traditions, together with current innovations discovered through lectures and site visits and paying attention to the carrying capacity of the landscape and the existing construction resources the students have envisioned future architectures.

Hosted by the Institute Urban Landscape (IUL), and the partner institution – and in collaboration with Antwerp University, Faculty of Design Sciences, Architecture (Antwerpen, BELG), the industry partner ERNE Holzbau AG and external experts – the Summer School has been addressing challenging questions regarding the use of wood and other biobased materials and set the ground for more interesting discussions in the future.

Finally, we would like to thank everyone involved, it has been an inspiring few days!

01
Summary
Wood and the City
2nd Edition

Through the analysis of past traditions, current innovations and the carrying capacity of the landscape the students have envisioned future architectures. The following themes were at the center of the projects.

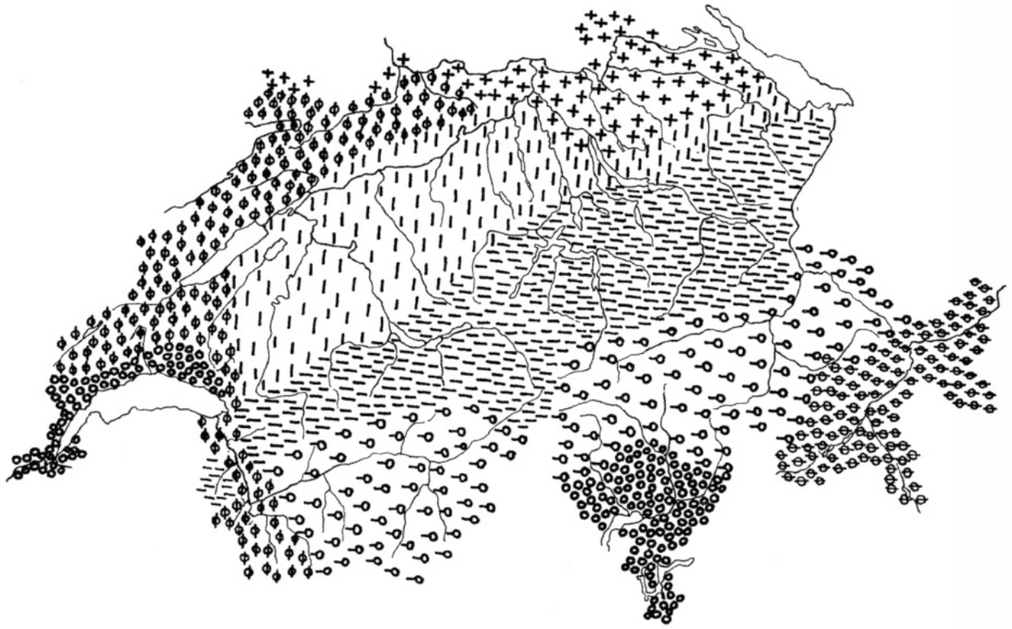
Ambitions
Care & Repair

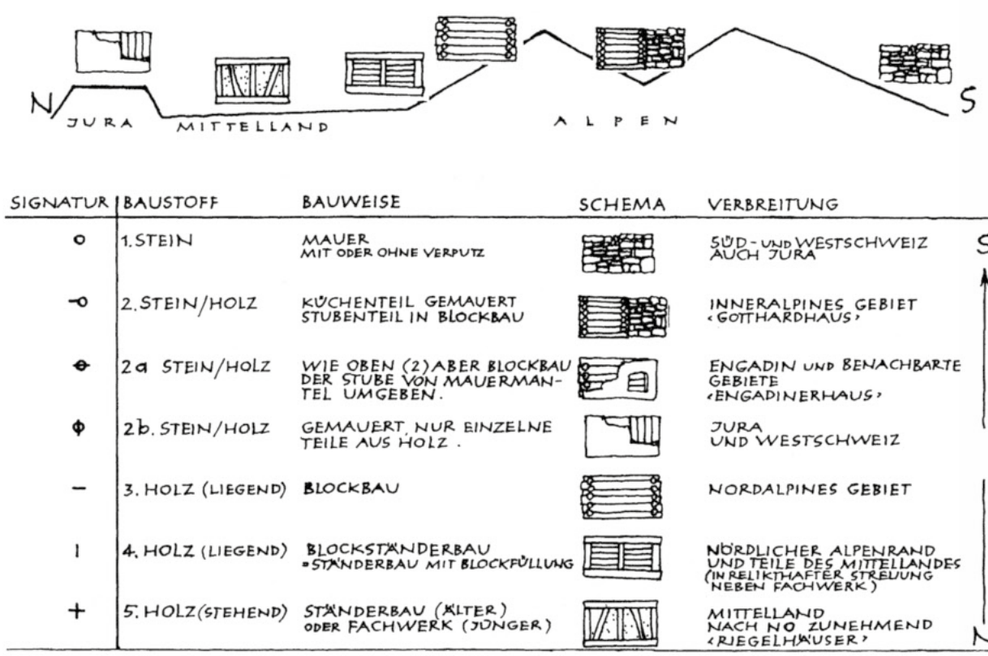
Our main site of exploration is the Ballenberg Open-Air Museum, where historic timber and hybrid buildings of rural Switzerland offer an interesting reference point for discussing possible solutions to current challenges.

Based on the concept of “Care & Repair”, the ambition for the ZHAW Summer School is to reimagine and design flexible programs and infrastructures for the museum and for research and experimentation beyond. By getting in touch with the material wood, we will explore the relationship between the landscape, available resources and construction, aiming to foster new architectural narratives and designs.

Learnings
From the past to current innovations

As built cultural heritage, Ballenberg’s buildings preserve the knowledge of different regional construction traditions. In particular, they derive their value from the careful use of local resources as well as from the craftsmanship and insight of the builders and the owners who maintained the structures for centuries. At the same time contemporary advanced technologies and research lead to new building methods, opening interesting solutions for wood in combination with other materials. By visiting ERNE AG





4 Distribution map: building materials and construction methods in Switzerland
From: Richard Weiss, Häuser und Landschaften der Schweiz. (Bern: Haupt, 2017)

Holzbau, a leading Swiss timber industry exploring the combination of wood and clay, we will learn about current innovations in hybrid and sustainable construction.

Makings
Hands-on experience

Working with our hands is a fundamental aspect of experiencing the world, offering a tactile connection that transcends mere observation. Through actively engaging in a dynamic process of learning, reflection, and connection, the crafting of wood with our hands allows us to intimately understand the material. It allows us to experiment, and to learn from both success and failure. In the process, we cultivate patience, perseverance, and problem-solving skills. Moreover, as we create, we reflect on our choices, refining our techniques and deepening our understanding of the world around us. Therefore, during the ZHAW Summer School we will experience a hands-on workshops that will allow us to explore tactile and technical aspects of the material.

Inspirations
In theory and praxis

Guest lectures with experts ranging from philosophy, visual arts, engineering and architecture, among others will provide valuable inputs throughout the summer school. Three books will form our theoretical framework and serve as inspiration:

A Way of Life – Notes on Ballenberg
Rolf Fehlbaum (ed.), 2023

Gegen Wegwerfarchitektur
Vittorio Magnago Lampugnani, 2023

Touch Wood – Material, Architecture, Future
Carla Ferrer, Thomas Hildebrand,
Celina Martinez-Cañavate (eds.), 2022

02
Agenda of the Week

31.08, Saturday
Wood & The City

Arrival Day

Arrival
ZHAW

14.00
Input #I
Introduction **Summer School Team**
Video & discussion **Lars Müller**

15.45
Input #II
Mario Rinke
Alessandro Tellini

17.15
Transfer
Winterthur – Brienz

Sleepover
Brienz

01.09, Sunday
Wood & Building Traditions

9.30
Visit #I
Guided Tour Ballenberg

Explore

Site Ballenberg

13.00
Lunch

13.30
Workshop
Mario Rinke & Alessandro Tellini

Sleepover
Brienz

02.09, Monday
Wood & Re-Use

8.30
R #1

9.00
Workshop
Mario Rinke & Alessandro Tellini

12.30
Lunch & Transfer
Ballenberg – ERNE

14.30
Visit #II
ERNE

17.30
Transfer
ERNE – Winterthur

03.09, Tuesday
Wood Innovations

8.30
Welcome
Oya Atalay Franck

9.00
Input #III
Andrea Frangi

10.30
Work in Groups

12.30
Lunch

13.30
Input #IV
David Klemmer

14.30
Work in Groups

17.00
Reaction R #2
Mind-map and references.
Outline of topics of interest

04.09, Wednesday
Wood & Circular Construction

9.00
Input #V
Catherine De Wolf

10.30
Work in Groups

12.30
Lunch

13.30
Input #VI
Lukas Ingold

14.30
Work in Groups

17.00
PinUp #A
Synthesis of reactions.
Outline of ideas for the brief

05.09, Thursday
Wood & New Narratives

9.00
Input #VII
Helen Romakin

10.30
Work in Groups

12.30
Lunch

13.30
David Klemmer

15.30
Work in Groups

17.00
PinUp #B
Timeline of the transformation.
First visuals (Images)

06.09, Friday
Wood Future

9.00
Input #VIII
Andreja Kutnar

10.30
Work in Groups

12.30
Lunch

13.30
David Klemmer

15.30
Work in Groups

07.09, Saturday
Final Presentation

8.30
Final Presentation

13.30
Farewell Lunch

Departure

08.09, Sunday
Departure Day

Departure Day

03
Diary of the Week

Input Mario Rinke
Buildings as woven time layers

by Markus Werner

As part of the introduction course on Saturday, 31. August, Mario Rinke from the University of Antwerp held a presentation on the topic of constructing with wood – in the past, how things changed, what we do today and how we might do things in the future.

Mario started off by explaining how wood has been the building material since the dawn of mankind. Architecture and wood grew up together, humans learned how to build with this living material, implementing it where its strengths could shine. With the industrialisation and new prevalence of steel, efforts were made to replace the sometimes stubborn and unwieldy material wood for the more robust and durable material steel. As seen in the example of the Iron Bridge from 1781, in these early days steel structures imitated wood structures in both shape and form of joinery. That's what had worked until then, the new material first required new discoveries. Not long after, concrete started replacing steel as the dominant construction material. Again, as in the example of the Iron Bridge, first concrete structures like the Système Hennebique imitated what was known from steel. Concrete would then go on to become the dominant building material of the 19th to 21st century.

In the second part of his presentation, Mario gave us an introduction into wood as a modern material. While raw wood had always been used for its natural strengths, it also always had its weaknesses. What we now know as "glulam" or glued laminated timber is an example of how the strengths of the material can be greatly increased, while its weaknesses are lessened. Initially coming from shipbuilding, the concept of glueing wood together

in shapes and forms corresponding to its required needs also vastly improved the usability of wood as a building material. Today we have countless building systems and material combinations that use wood, CLT being one of the most implemented.

In the last part of his presentation, Mario talked about modern buildings and how they change over the course of their life. The function of a building may be clearly set in its initial design, but as needs and requirements change, so does the desire for the building to change with them. To accommodate for this, we should think “circular building” – how our designs can be adapted, and later, how building parts can be reused. This is a fundamental key to sustainable building.

A visit to the Ballenberg Open-Air Museum: an insight into the world of traditional wooden constructions

by Jasmin Angst

On the second day of the Summer School, we visited the Ballenberg Open-Air Museum. From our youth hostel in Brienz, the museum can be reached within a few minutes by bus. Right at the beginning, our group was divided into two parallel guided tours, one in charming Bernese German and one in English.

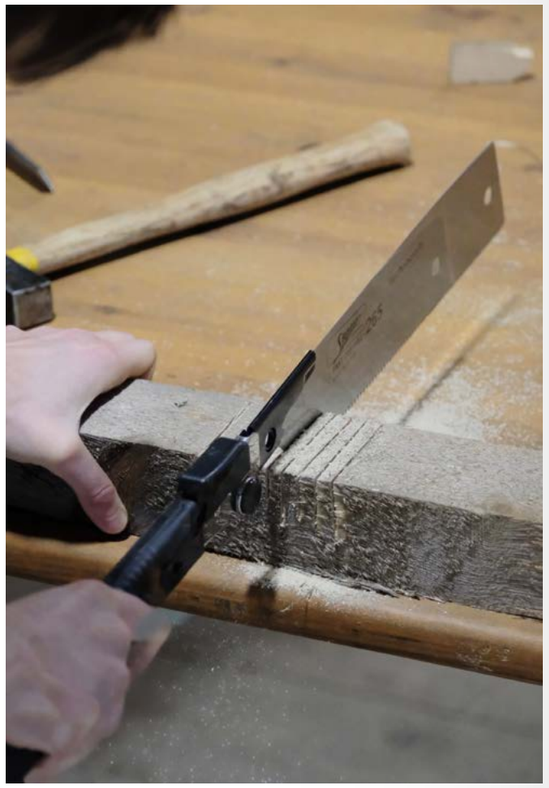
The Ballenberg Open-Air Museum covers an area of around 66 hectares and is home to more than 100 faithfully reconstructed buildings from various regions of Switzerland. These buildings are up to several centuries old and offer a lively insight into the past. They impressively show the architectural and cultural developments of the respective region.

During our tour, our focus was on the many different wooden constructions. These are of great importance in traditional Swiss architecture. Wood is not only a widely used building material, but also a central element of cultural heritage. The many different techniques that have been developed over the centuries reflect the adaptability and engineering expertise of the builders of the time.

The tour began with the administration building, which was designed by Gion A. Caminada in 2008. The new building was opened in 2010 and impresses with its carefully designed curtain wall façade. The solid, untreated spruce boards from the region are attached vertically, overlapping like a dress. The visible screws look like an ornament and are reminiscent of traditional fixing methods.

While we admired the decoration of some of the buildings, the construction of others aroused our interest. The manufacturer's

5–7 Visiting the Ballenberg Open-Air Museum



8-12 The students adopting a “hands on” approach during the wood-workshop

13 Mario Rinke and Alessandro Tellini leading the wood-workshop #makingiseverything

villa fascinated us with its elaborate but playful and loving fretwork. We were more impressed by the timber framework construction of the 18th century craftsman's house. Our guide explained how important this construction method was, and how a porch was built to withstand the weather conditions in Switzerland. The precise craftsmanship visible in the details of the construction gave us a deep understanding of the skills and knowledge of the carpenters of the time.

We spent a little longer at the Madiswil farmhouse from 1709, which was designed for two families and has a divided central area. Sausages and strips of bacon are still smoked on the kitchen ceiling there today. Fortunately, we were all allowed to try a few slices of salami later on.

The Kiesen granary amazed us with its simplicity. Only “half logs” were used for the log construction and the lowest wall plank was halved, or almost quartered, and modified so that the floor construction could be attached directly. In an amazingly short time, we were able to compare pragmatic peasant houses with historic prestige buildings. And all of the constructions shone with ingenious craftsmanship.

We walked past glorious chestnut trees and made a short detour to the Ticino area. This is where the largest building in the open-air museum is located. The manor house was built 700 years ago in Novazzano and has been in Ballenberg since 2003. It took over 200 truck journeys to transport it.

The visit to the Ballenberg Open-Air Museum not only offered us an opportunity to study historical wooden constructions, but also an opportunity to reflect on the connection between architecture and culture. Each building in the museum tells its own story and represents the specific needs and lifestyles of people in different times and regions. This also applies to the ruins of a 17th century farmhouse, which came to the museum in 1990 and unfortunately burned to the ground four years later. It will not be rebuilt and is now a symbol of the very frequent fires of the past.

Overall, our visit to the Ballenberg Open-Air Museum was an enriching experience. The detailed explanations and the opportunity to see original wooden constructions up close deepened our understanding of the importance of tradition and craftsmanship in architecture significantly. We left the museum with a new appreciation for the artistry of historic building methods and a more profound insight into the cultural and technological evolution of architecture in Switzerland.

Wood-Workshop at Ballenberg with Mario Rinke & Alessandro Tellini #makingiseverything

by Lukas Baur

After the countless impressions gathered during the walk through the Ballenberg, the workshop with Mario and Alessandro was all about gaining practical experience and working with wood according to the motto ‘hands on’. The aim of the workshop was to gain a basic understanding of the material and get a feel for its properties through simple exercises.

After a brief introduction to the most important tools and their application techniques, the students were able to make a simple knot connection (simple lap joint) on two spruce slats. The exercise served as a simple introduction, creating a feel for the tools and the wood. The marked cut-outs were precisely cut out with a saw and a chisel bag and almost perfect knot joints were created. Mario and Alessandro provided support where necessary and shared valuable tips and tricks.

After the short introductory exercise, the experience gained was discussed again together. The difficulties and possible solutions were elaborated with all students. The second step was to build a small piece of furniture, which was first designed in small groups. The simple lap joint from the first exercise can easily be applied to three elements, creating a three-dimensional knot connection. This knot was used as the basic knot for a small object, e.g. a bar table, a bench or a chair, which each group designed and then built. The various objects were designed using sketches and small wooden sticks and then briefly presented. Prototypes were used to determine the dimensions in more detail and to test the joining of the individual beams. All objects were built from wooden beams measuring approx. 6x6 cm in diameter. The raw beams came from Ballenberg and had to be checked precisely for their fibres in cross-section and the proportion of knots. Excessive twisting, a large amount of resin or many knots had a direct effect on the accuracy of the furniture. Sawing, planing and studying took place in a cosy atmosphere in the open barn at Ballenberg. After a few hours, all the groups had completed their individual parts and assembled them. Although the knot connections were basically very simple, it was always necessary to check exactly which parts were at the top, bottom or side in order to complete the knot in the desired shape. In the end, five exciting objects were created, all with different themes: from height-adjustable tables to a small set of stairs to a play bridge over a stream, to name but a few. All of the objects were briefly presented and the process, the experience gained and the division of labour described. Of course,

Alessandro carried out a load test in each case to check the practical suitability.

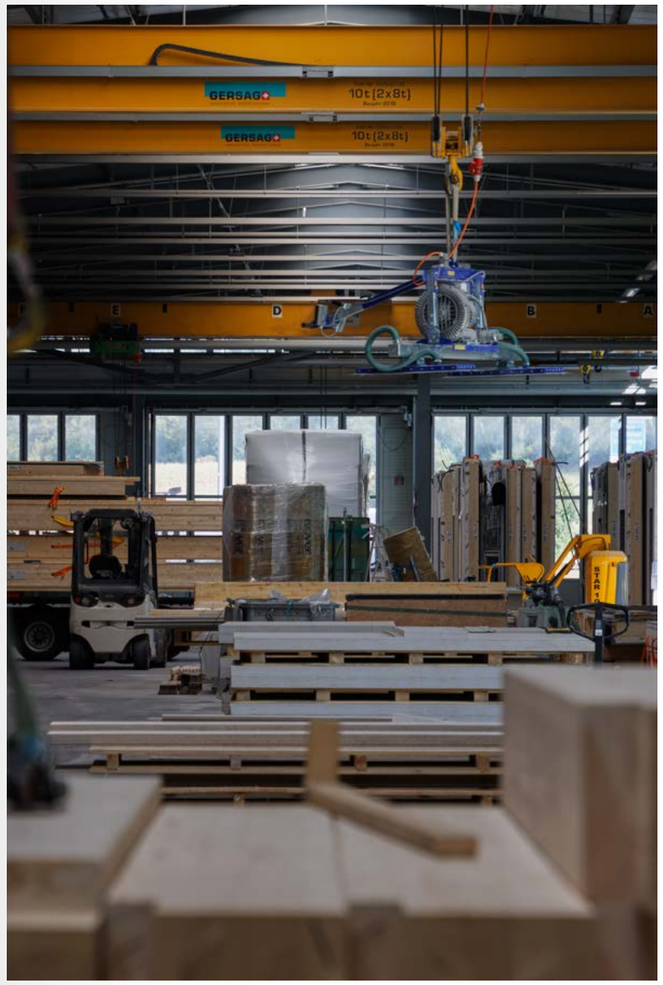
The workshop was very enriching on various levels. Building with your own hands helped to get a feeling for the material and an understanding of the necessary precision. To actually build the design ourselves led to a direct review of the planning and was not only fun but also very instructive. It should also be mentioned that the collaboration with Mario and Alessandro was very pleasant. Their inputs were very helpful and it was impressive to see how quickly simple and precise plug connections could be made using good technology. The charm of the old coach house in which we worked allowed us to travel back in time a little and fully immerse ourselves in traditional woodworking. The workshop was a great way to start the week and everyone really enjoyed working with wood.

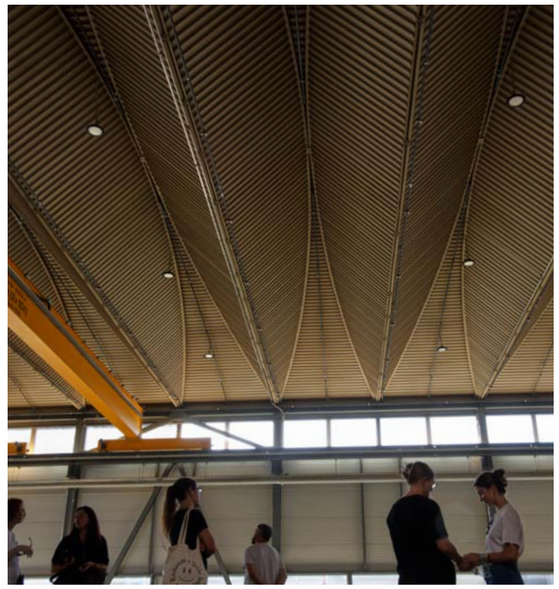
Visit at ERNE Holzbau AG

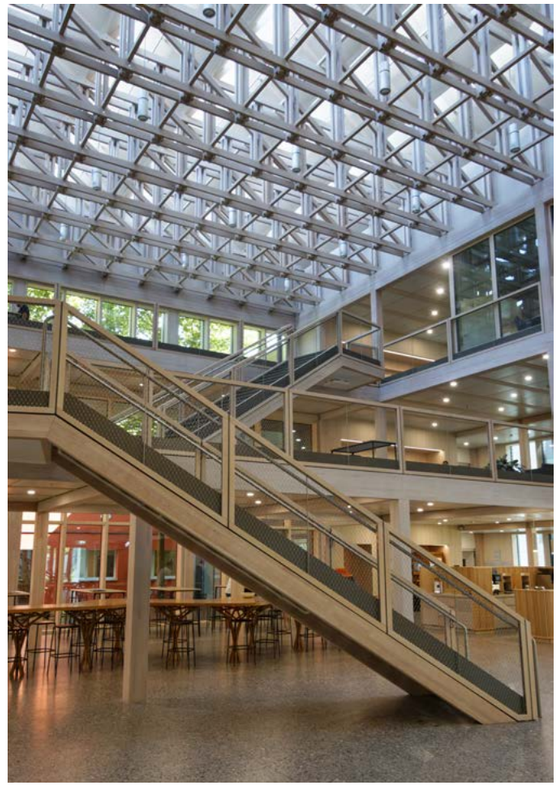
by Emira Redjepi

ERNE Holzbau is a leading Swiss provider of sustainable building solutions. With the prefabrication of building components and their innovative use of materials like wood and clay, ERNE represents the transition from traditional craftsmanship to resource-efficient building techniques.

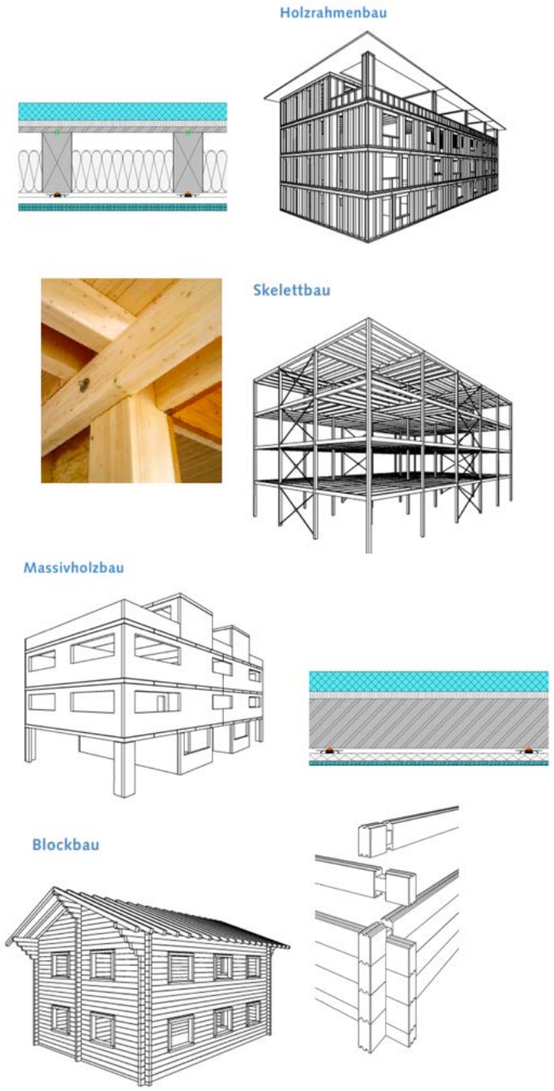
The focus of the visit to ERNE Holzbau was the industrial prefabrication of building elements. Element construction allows for the production of entire building components like roof, wall, ceiling, and floor elements in the factory. These are then prefabricated and delivered to the construction site, where they are efficiently assembled. This approach offers significant advantages. Besides saving time and reducing construction costs, element construction provides consistently high quality since all work steps are performed under controlled conditions. Particularly impressive was how Erne organizes their production lines in the workshops. For example, windows and doors are integrated into the prefabricated wall elements in the factory. Besides traditional wooden elements, they also use innovative material combinations, such as concrete-wood composite ceilings, which offer an optimal mix of stability and lightness. These hybrid solutions clearly demonstrate how Erne combines traditional building methods with modern requirements for structural integrity and sustainability. The clay walls in the main building were especially impressive, as they are not only stable but also excellently regulate moisture. The main building of ERNE Holzbau AG is a prime example of the use of these innovative building elements. It shows how prefabricated



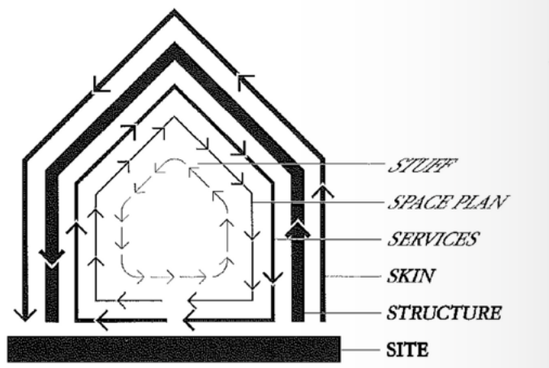




14–16 Impressions from the site visit at ERNE Holzbau AG



17 Contemporary timber constructions – from Andrea Frangi's input



SHEARING LAYERS OF CHANGE. Because of the different rates of change of its components, a building is always tearing itself apart.

18–19 Huber-Villiger wooden pavilion – from Elias Knecht's input on circular technology for architecture
20 The shearing layers of architecture – from Mario Rinke's input on buildings as woven time layers

components, various material combinations, and sustainable construction methods can work well together in a modern industrial building. The tour of the production halls not only gave us insight into the complexity of modern wooden construction but also showcased how tradition and innovation can be integrated in the building industry.

At the Ballenberg Open-Air Museum, we experienced firsthand how traditional building methods with regional wood shaped the architecture of the past. The historical wooden houses on the site demonstrate the use of local resources and craftsmanship. We saw a strong contrast to the modern construction methods at Erne, which also provided valuable insight into the roots of wooden construction. It was particularly impressive to see how traditional building methods at Ballenberg and modern manufacturing at Erne both pursue the same goal: sustainable and responsible building.

The look into the past at Ballenberg helped us recognize the relevance of traditional knowledge and craftsmanship for today's building practices. At the same time, our visit to Erne showed how these principles can be implemented and further developed in a modern world. The combination of time-tested techniques and forward-looking innovations demonstrates that sustainable building is not only possible but essential to meet future challenges.

Input Prof. Dr. Andrea Frangi
Building with Wood – An overview of contemporary timber construction in Switzerland

by Markus Werner

On Tuesday, 3. September, Prof. Dr. Andrea Frangi visited us at the ZHAW in Winterthur and gave a presentation on building with wood. As an important Figure in the Civil Engineering and Timber Structures Departments of the ETH Zürich, his presentation was highly anticipated and met with great fascination.

Dr. Frangi started off by introducing us to his faculty at the ETH in Timber Engineering and what they've worked on over the years. The faculty has three departments: Basic Timber Research, Innovative Timber Research and Fire Safety that work together to improve on existing knowledge and developing new systems.

Next, Dr. Frangi gave us a short historic overlook on timber and how it's been used in construction since the dawn of man. In recent history, its use fell out of fashion in favour of the ever-present concrete – which now, fortunately, an effort is being made to reduce. One of the great advantages of contemporary timber structures is the ability to pre-fabricate, or pre-fab as it's called in professional circles, a method of maximising the strengths

of the material in a sheltered environment while minimizing the negatives. By constructing highly precise building elements in a workshop, and then quickly assembling them on the building site, the risks of damage and time delay are greatly reduced while the technical expectations can be increased.

Cross-Laminated Timber is probably the most popular method of implementing Wood in construction today. While highly material intense, the material is fire protected through the sheer mass, and it functions as a carbon sink. Dr. Frangi pointed out, that while this method may be fast and safe in planning, it cannot be the future of Swiss timber construction. Europe simply doesn't have enough wood for this, it's a waste. In Switzerland, the future lies in efficient wood materials, like spruce layered panels or more interestingly, beech laminated veneer. We need to put effort into using more wood species, not only spruce as it's so widely used today. Dr. Frangi explained how wood is used highly innovatively in Swiss buildings. Every company is developing and refining their own new construction systems. There are many discoveries to be made, and potentials to be exploited. Dr. Frangi added that he sees no reason to build Swiss medium-rise buildings in any other material than timber – it may not be the end-all solution, but it's a great start.

Lastly, Dr. Frangi talked about the much-discussed topic of fire safety that prevented timber constructions from booming in the past. Many steps have been made in the past 20 years, nowadays, Switzerland boasts some of the most advanced regulations for timber construction & fire safety. He explained that they operate on the aptly named "Swiss-Cheese-System", where many non full-proof layers of safety together make one fully functional system. Thanks to these recent developments, timber construction is able to push into the high-rise territory.

Input David Klemmer
Utilising AI to create the imaginary

by Markus Werner

On Tuesday, 3. September, David Klemmer visited us at the ZHAW in Winterthur and gave a presentation on artificial intelligence and image creation. He started off by giving a short introduction of his studio in Zürich and the work he does – mainly image creation and photography.

The first part of David's presentation was dedicated to giving us an idea on what artificial intelligence can, and what it can't do to create virtual images. In Architecture we love using images to convey an idea or a feeling of something we've designed – this is exactly

21 Utilising AI to Creatre the Imaginary: Student AI generated imagery inspired by David Klemmer's input

where AI fails massively. If you try to convey an exact imagination of yours and have it create exactly that as an image, you'll have a bad time. Where it does exceed though, is in the earlier stages of design, where ideas are just fragments waiting to be concretised. Here, an image created with mere fragments may give you a hint, might help shape the design. This is also where we intended to implement AI in our own projects for the Summer School. Due to strict time limitations, an idea-generating machine would come in handy.

In the second part of David's presentation, he introduced us to the AI image-creation-system Midjourney. Going viral a few years ago, Midjourney is accessed over the gaming communication platform "Discord", where communication happens. By giving the AI prompts in form of words, texts or even images, the AI returns usually four images conjured up from the initial ingredients. We quickly realized that these images are more predictable than expected, yet strangely disconnected from reality – this shouldn't have been a surprise in hindsight. Stumbling into the world of AI was a bit overwhelming at first, but soon enough we had the basics figured out.

David then supported us in the following days by helping us with the AI-imagery for our projects. The vast mass of these images was shocking, there are basically no limitations and a click of a button and a short wait of 30 seconds produces another 4 images to the pile. Some were surprising, some were silly or useless, but some definitely helped us form our ideas, it was a very informative and interesting experience.

Input Elias Knecht
Circular technology for architecture – The "reuse" of a wooden building

by Ozan Can Özdemir

Elias Knecht presented a project at the ETH in Zurich. The institutes involved in the project were Wiederverwerkle, Baubüro In Situ AG, ETH Zurich, DARCH and D BAUG.

The project involved three lightweight, temporary buildings in timber construction, which were built on the ETH campus in 1987. The buildings were constructed in such a way that they could be easily dismantled. The project now consists of dismantling these buildings into their individual parts and then reusing these parts for other projects.

Working with the theme of "reuse" can be a lot of fun, he says, but can also be complicated because there are several parties involved in the whole thing.

One of the things that is not so good in the construction industry in Switzerland is the fact that they produce a lot of waste and a lot is simply replaced directly with new construction. This is a big contributor to global climate change, CO2 emissions and energy consumption. That is why they want to start using the material that is already there instead of extracting new resources.

Back to the project: due to time constraints, 2 of the 3 buildings were completely destroyed and transported away, while the third one was dismantled to reuse the parts. Some of these reusable parts could be reused in other projects, but not all. The remaining parts were uploaded to a platform where other people could see them and buy them to use in their projects. They didn't had much time, as they wanted to get rid of the parts as quickly as possible.

Elias Knecht showed us lots of projects that could use the parts of the dismantled pavilion in some way. The parts that were left over were used to create a wide variety of projects with the various professorships on the ETH campus. The main project, however, was a pavilion as an art project on the campus, which will be dismantled at the end of 2025.

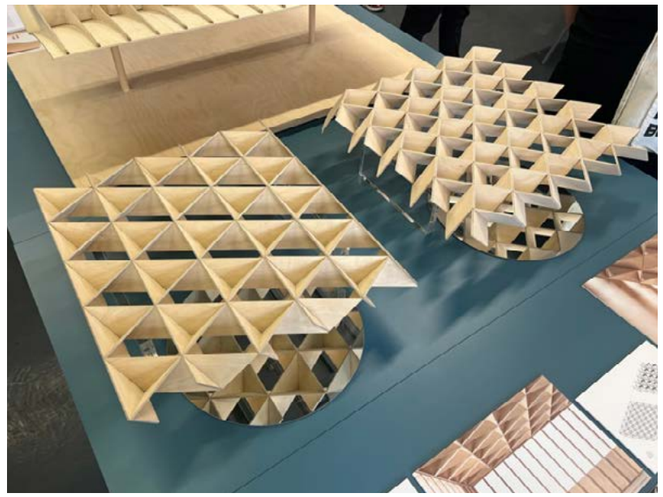
One of the things you could experiment with in the future is that you could perhaps celebrate and show reused materials rather than trying to hide them.

Input Lukas Ingold – Catherine de Wolf's chair Plywood

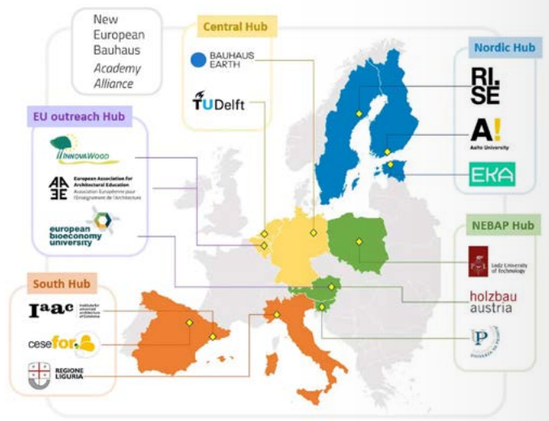
by Simon Keller

Lukas Ingold introduced us to the world of molded plywood and its potential in modern construction. He began with a brief overview of the history of molded plywood: The American, Isaac Cole, was the first to patent a process for manufacturing molded wood in 1874. He designed a chair made of laminated wood strips, and this is still what molded plywood is best known for today: chair seats, armrests, and other furniture components. Through cross-laminating veneers, wood can be pressed and glued into two- and even three-dimensional shapes with great material efficiency and high stability.

In the early 20th century, monocoques for airplanes were made using this product in France. From the 1930s onwards, Alvar Aalto's furniture also gained great recognition. Large architectural projects, such as laminated wood roofs, were realized by Heinz Hossdorf, the company Lignoform, and the engineering firm Perreten & Milleret (and others). A notable example is the "Halle des fêtes" at Expo 64.



22–23 Learning about molded plywood with Lukas Ingold



24 New European Bauhaus Alliance – from Andreja Kutnar's input on the role of wood in construction
25 Helene Romakin adressing patchy architecture

As part of his work, "Formsperrholz – Material, Struktur, Raum," developed through the sixth BSA Research Fellowship, Lukas Ingold explored how we could harness the possibilities of this product in architecture in the future. He evaluated remarkable potential, especially when compared to traditional frame structures, both functionally and aesthetically.

One notable advantage is the material efficiency, which directly affects the weight of the constructions. The design potential of laminated plywood was also explored through five model structures. These models were created using relatively simple methods, such as hard foam negative molds and vacuum pressing. After about 20 minutes, the glue had hardened enough to remove the structure from the vacuum bag. The wood was slightly moistened beforehand because a glue that binds with water was used.

The organic construction forms (one resembling a leaf, another a mushroom) demonstrate that laminated plywood holds great architectural potential, both in terms of construction and design. Modern computer programs also make it easier to calculate such complex forms, which would have been far more challenging a few decades ago.

Despite all its advantages and potential, there remains a significant question regarding circular economy. Due to the gluing process, especially in three-dimensional structures, there is little opportunity to reintegrate these elements into a new context after their initial use. Additionally, since plywood requires a relatively high amount of glue, it becomes clear why the ecological footprint of a molded plywood cassette ceiling is slightly worse than that of glued laminated timber beams, and significantly worse than that of solid wood beams. This was a very interesting insight into a wood product that is ubiquitous in furniture but may not have received enough attention in house construction yet.

Input Andreja Kutnar
The New European Bauhaus and the role of wood in construction

by Ozan Can Özdemir

Andreja Kutnar is, among other things, the director of the research institute "InnoRenew", which was founded in 2017. It is dedicated to the topics of renewable materials and sustainable buildings (specifically targeting innovative approaches to wood and its use, with the goal of transferring scientific knowledge into industrial practice). They are also a New European Bauhaus partner.

Andreja talked firstly about the climate crisis. In the year 2020, the anthropogenic mass, which has recently doubled roughly every 20 years, will surpass all global living biomass. Another important point of her presentation was the regional temperature change. The land is warming faster than the oceans and the northern hemisphere is warming faster than the southern.

In 2021 the New European Bauhaus was initiated by the European Commission with 3 key factors: environmental sustainability, social inclusion and beauty/art/culture to build bridges between different areas of knowledge and different disciplines to connect the Green Deal to everyday lives.

The New European Bauhaus also do activities, like a Summer School to teach how wood could be used for sustainable built environment. Recently they announced new investment guidelines with 4 main points: Conception, Design, Implementation, Use. In these 4 points, they have explained their views in several sub-points.

Regarding to Andreja, wood is the main climate-neutral or climate-negative building material. So where is wood science going? It can replace a lot of other material and cause a lot less CO2. So we have to stop burning wood, and instead of that we have to use wood to build more buildings with it.

There are other things to do, for example we have to do more fundamental and applied research, we have to upskill and reskill construction ecosystems, update the curriculum of existing study programs, develop new study programs and develop micro credentials for reskilling and upskilling.

Wood and other nature-based materials sequester and store carbon in multiple products, which can be reused, remanufactured and recycled over centuries. So, what we have to do is, to design resilient buildings for the “new normal”. We have to use new timber species without fossil-based additives.

Input Helene Romakin
Patchy Architecture: Thinking with Wood

by Paola Colin Ramirez

Helene Romakin, in addressing the topic of Patchy Architecture, begins by challenging us to question whether our beliefs are based on reality or learned perceptions. For instance, the belief that wood is not a durable material for construction leads to the question: how can we change the narrative towards a more sustainable future?

“We have entered the new epoch of the Anthropocene and there is no return.”

21st-century architecture has evolved under the influence of a modernist tradition that seeks to solve global problems through large-scale projects. However, this narrative has become closely linked to the capitalist logic of unlimited growth, an approach that has become unsustainable in the context of the Anthropocene, the current era characterized by human dominance on the planet. In this sense, Patchy Architecture emerges as a response to the challenges of the Anthropocene, proposing a more environmentally conscious and respectful approach.

Patchy Architecture proposes a set of principles aimed at rethinking architectural practice in the context of climate and ecological crises. These principles include:

Principles of Patchy Architecture

- → Transdisciplinary Content and Tools
- → Resistance Against Exploitative and Extractivist Practices
- → Decolonizing Architecture
- → Symbiotic Interrelations: Thinking Like A Mountain
- → Critical Care, Maintenance, and Repair
- → Collective Knowledge Instead of Individual Excellence
- → Embracing Porosity and Uncertainty

These principles seek to overcome dependence on predefined technological solutions, embrace uncertainty, and foster symbiotic and collaborative practices. In this context, two specific principles are addressed: Critical Care, Maintenance, and Repair, and Embracing Porosity and Uncertainty.

Critical Care, Maintenance, and Repair

Care in architecture, according to the principle of Critical Care, manifests in practices such as maintenance and repair, which are not assigned to a specific gender, class, or race but are considered a collective responsibility. This principle aligns with Mierle Laderman Ukeles' 1969 manifesto, which highlights the role of maintenance in architecture as an essential practice, not only for preserving buildings but for the well-being and functionality of the communities that use them.

Embracing Porosity and Uncertainty

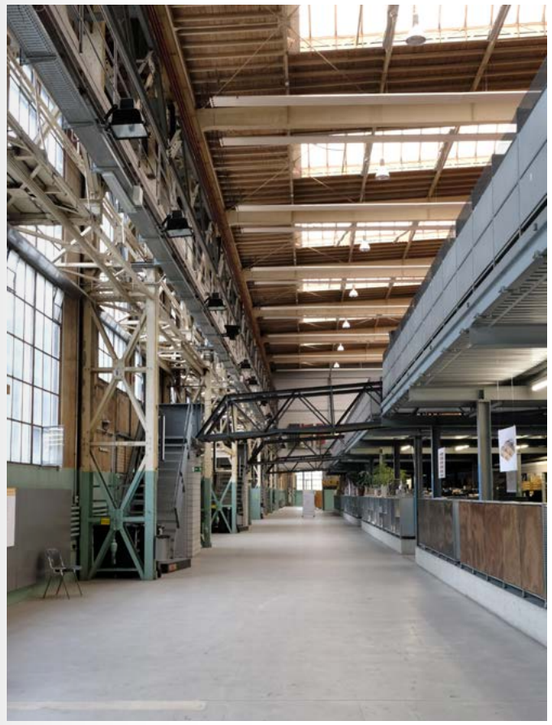
The second principle emphasizes the need to adopt an open and flexible mindset in architectural practice. Instead of seeking fixed and definitive solutions, Patchy Architecture promotes design as an ongoing process open to evolution. This approach

rejects predefined solutions and instead fosters iterative conversations that balance the preservation of local integrity with cultural renewal. Cross-cultural empathy and adaptation to new realities are viewed as opportunities to gain new insights and strengthen one's position rather than abandoning something.

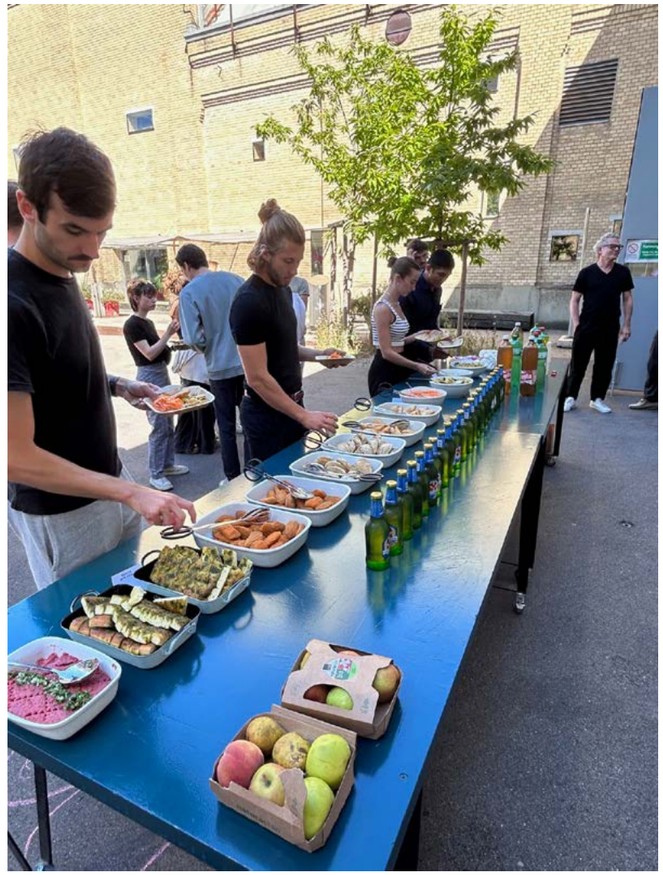
To illustrate these principles in practice, Helene has presented several examples of architectural projects and collaborations that address these concepts. One of them is the Venir Universidad project, an ongoing initiative involving the artist Ursula Lima and the studio Like at Home. This project represents a collaboration between the Inga people of Colombia and the University of Zurich and aims to establish an institution dedicated to higher education and research in the Amazon region.

The project focuses on promoting sustainable ecological coexistence and seeks to redefine architectural practice through collaboration and collectivity. Venir Universidad is based on indigenous knowledge and non-extractive, decolonial construction practices, highlighting the importance of maintaining decentralized structures and respecting oral knowledge and experiences related to nature.

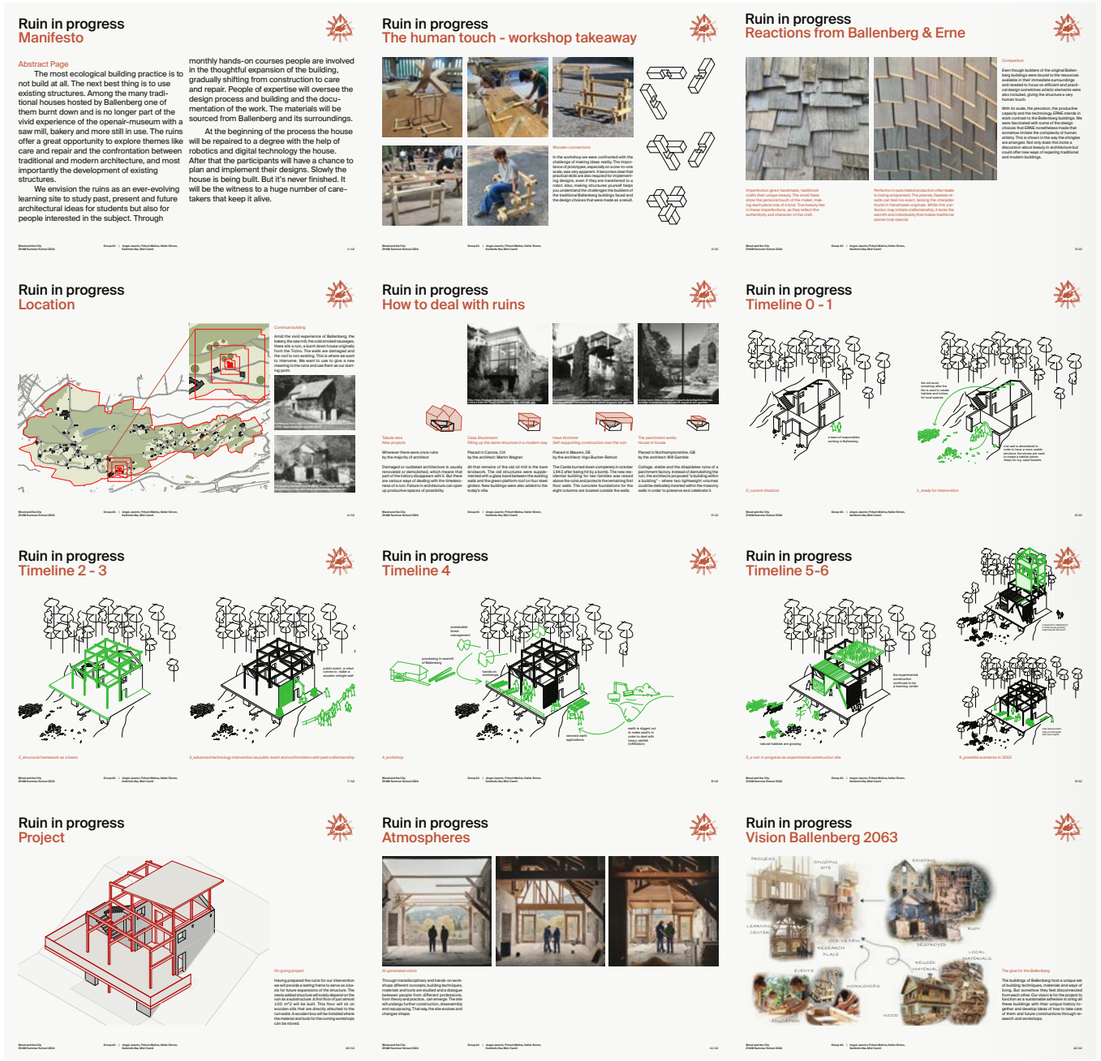
In conclusion, Patchy Architecture proposes a conscious and comprehensive approach to architecture in the Anthropocene era, adapting principles such as care, repair, and maintenance. These principles can be key to addressing the challenges of climate change and ecological crises, promoting an approach that values adaptability, cross-cultural empathy, and continuous collaboration.



26–27 Halle 180 where the students worked on their final projects and the various inputs took place



28–29 After a week of workshops, inputs, insights and discussions the Summer School ended with final presentations and a closing apero for students, faculty and constributors



Group 1, Poster reduction
Ruin in progress

04.1
Final Student Work
Ruin in progress

Jasmin Angst, Melina Fritsch, Simon Keller, Ilke Kerkhofs, Camil Müri

The most ecological building practice is to not build at all. The next best thing is to use existing structures. Among the many traditional houses hosted by Ballenberg one of them burnt down and is no longer part of the vivid experience of the openair-museum with a saw mill, bakery and more still in use. The ruins offer a great opportunity to explore themes like care and repair and the confrontation between traditional and modern architecture, and most importantly the development of existing structures.

We envision the ruins as an ever-evolving learning site to study past, present and future architectural ideas for students but also for people interested in the subject. Through monthly hands-on courses people are involved in the thoughtful expansion of the building, gradually shifting from construction to care and repair. People of expertise will oversee the design process and building and the docu- mentation of the work. The materials will be sourced from Ballenberg and its surroundings.

At the beginning of the process the house will be repaired to a degree with the help of robotics and digital technology the house. After that the participants will have a chance to plan and implement their designs. Slowly the house is being built. But it's never finished. It will be the witness to a huge number of caretakers that keep it alive.

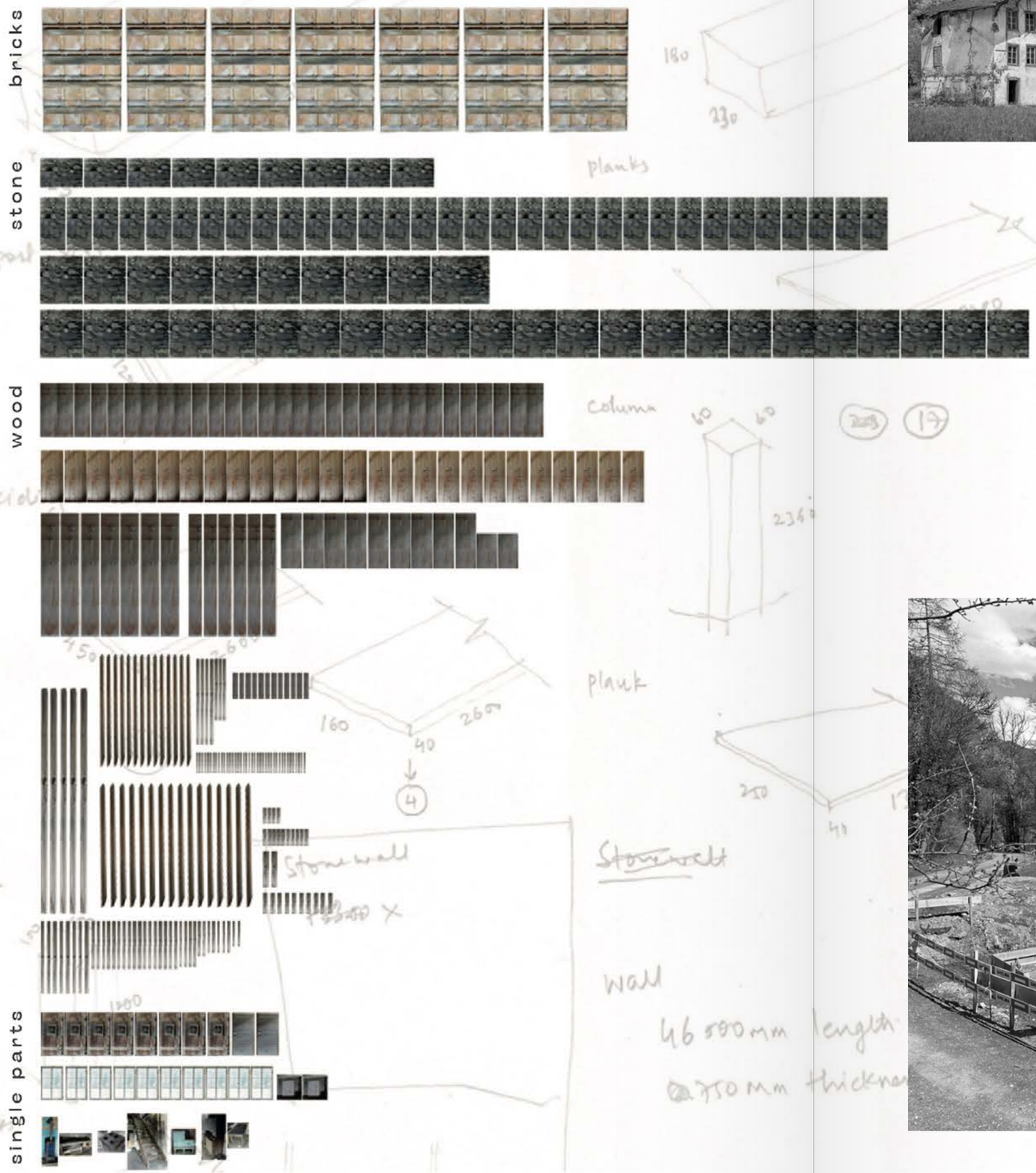
Group 2, Poster reduction
Second Skin

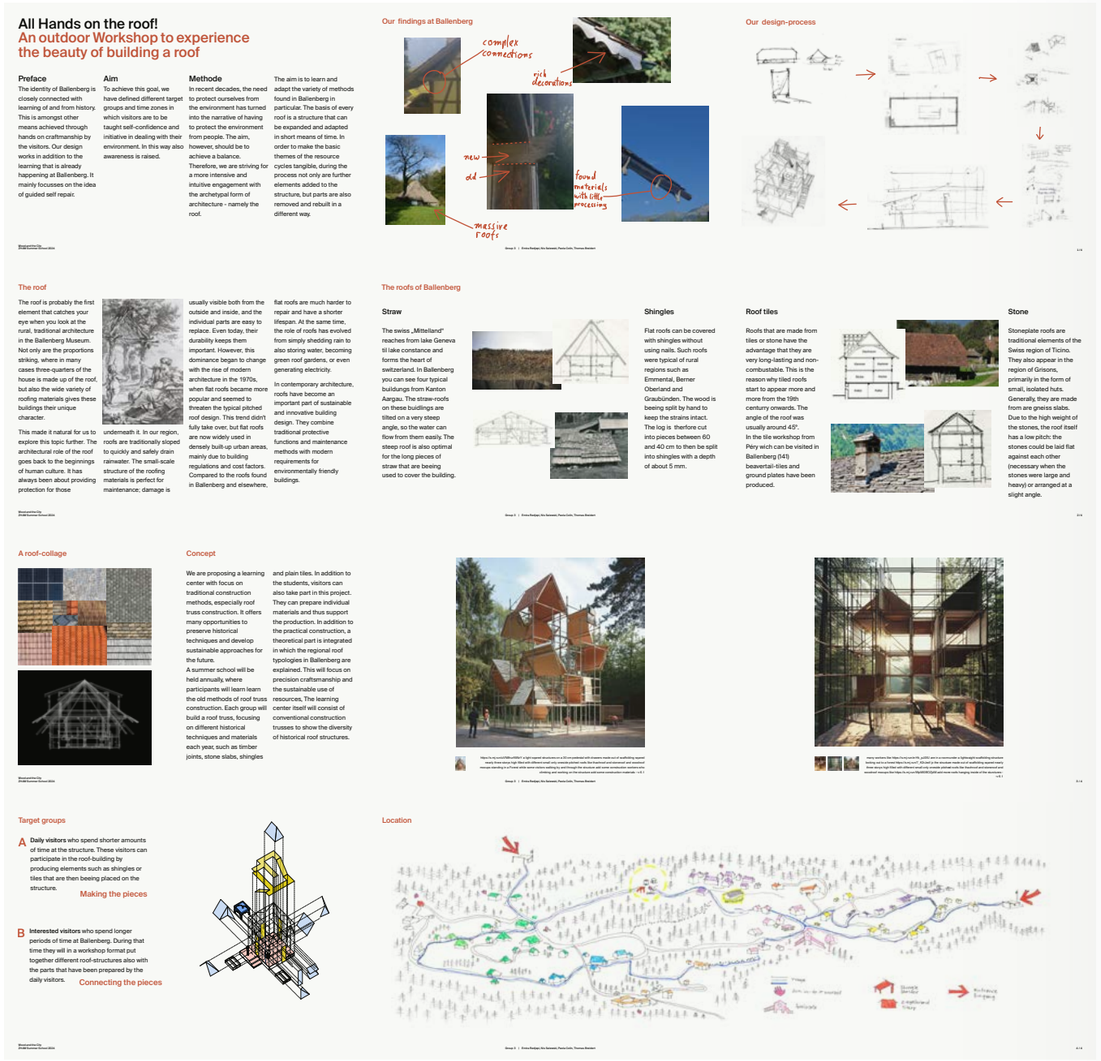
04.2
Final Student Work
Second Skin – A living archive of craftsmanship and reconstruction

Lukas Baur, Martin Dupont, Carina Gruber, Rajan Savaliya

In an era where cultural heritage is often overlooked, the Ballenberg Open-Air Museum has set itself the task of preserving this heritage. In order to present this process to the public, we envision a dynamic, temporary installation that embodies the spirit of preservation, craftsmanship and education. This structure is not just a functional storage space, but an experience where materials, history and craftsmanship come together.

Located on the very site where the traditional building will be resurrected, the temporary exhibition connects the past, present, and future. This structure, composed primarily of scaffolding, transforms the notion of architecture from static heritage to dynamic experience. The site is a living archive, a physical narration of dismantling and rebuilding, offering visitors a rare chance to engage with the raw materials before they are reincarnated into a historical edifice.


bricks
stone
wood
single parts



Group 3, Poster reduction
All Hands on the roof!

04.3
Final Student Work
All Hands on the roof!
An outdoor Workshop to experience the beauty of building a roof

Emira Redjepi, Nis Salewski, Paola Colin, Thomas Breidert

Preface

The identity of Ballenberg is closely connected with learning of and from history. This is amongst other means achieved through hands on craftmanship by the visitors. Our design works in addition to the learning that is already happening at Ballenberg. It mainly focusses on the idea of guided self-repair.

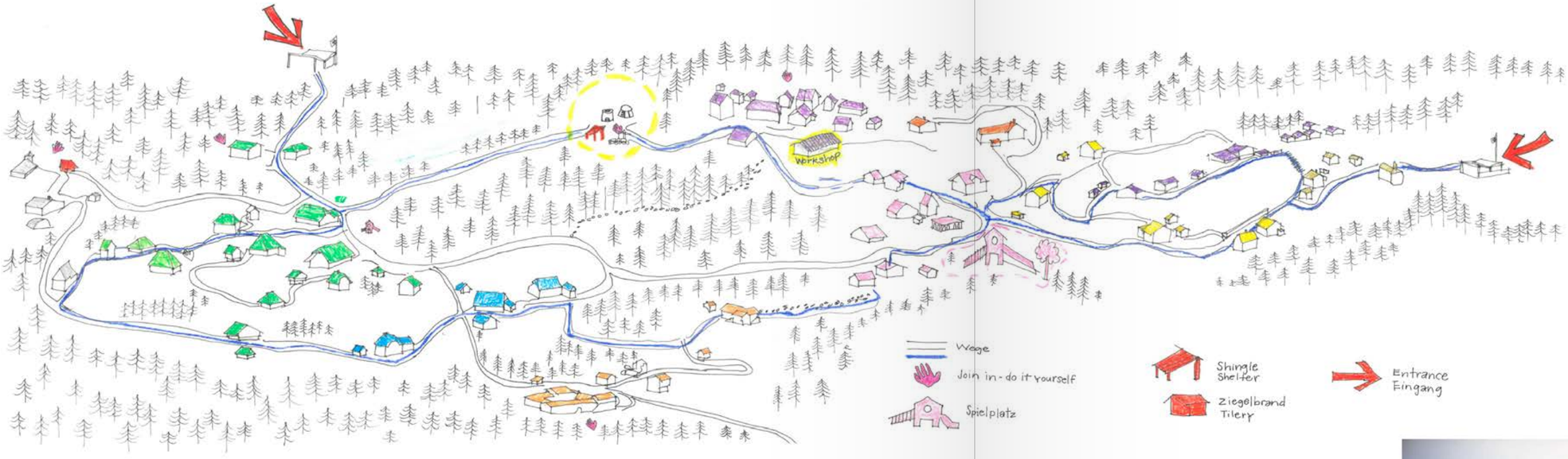
Aim

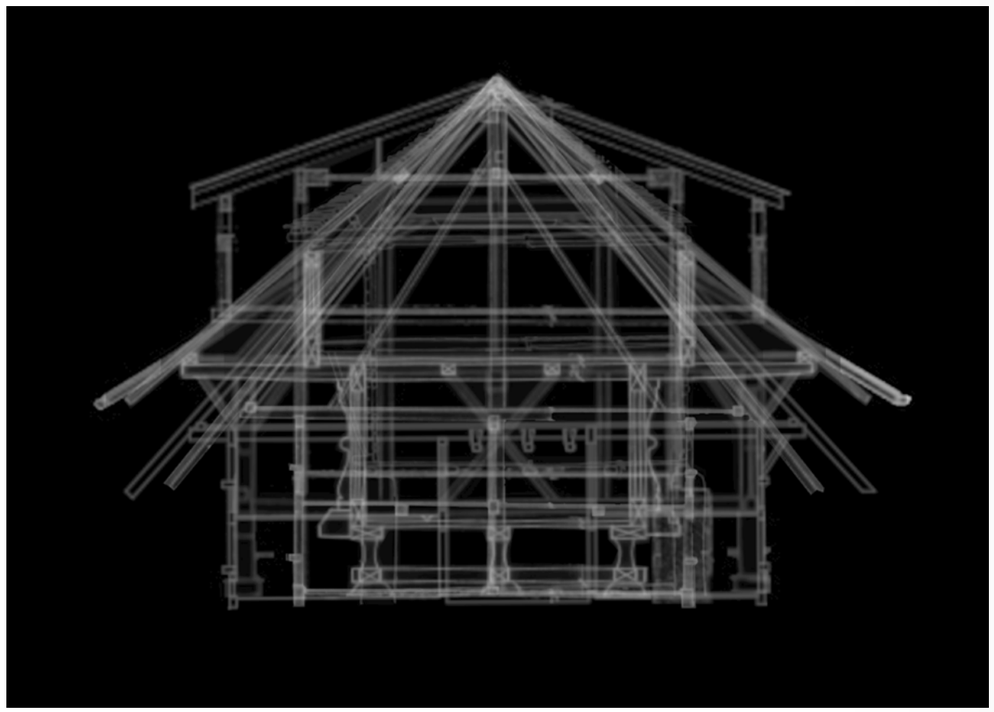
To achieve this goal, we have defined different target groups and time zones in which visitors are to be taught self-confidence and initiative in dealing with their environment. In this way also, awareness is raised.

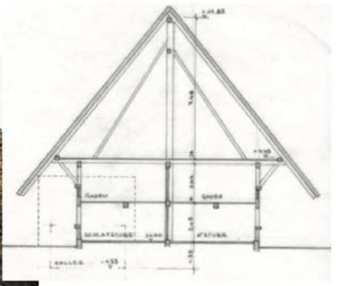
Method

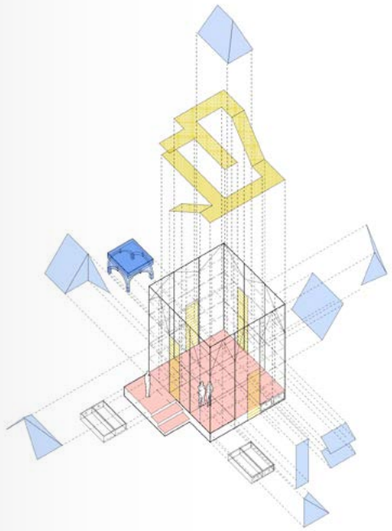
In recent decades, the need to protect ourselves from the environment has turned into the narrative of having to protect the environment from people. The aim, however, should be to achieve a balance. Therefore, we are striving for a more intensive and intuitive engagement with the archetypal form of architecture – namely the roof.

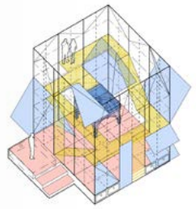
The aim is to learn and adapt the variety of methods found in Ballenberg in particular. The basis of every roof is a structure that can be expanded and adapted in short means of time. In order to make the basic themes of the resource cycles tangible, during the process not only are further elements added to the structure, but parts are also removed and rebuilt in a different way.

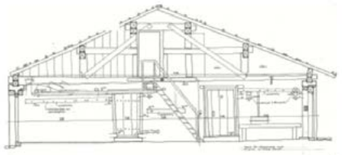

Workshop
Wege
Join in - do it yourself
Spielplatz
Shingle Shelter
Ziegelbrand Tilery
Entrance
Eingang

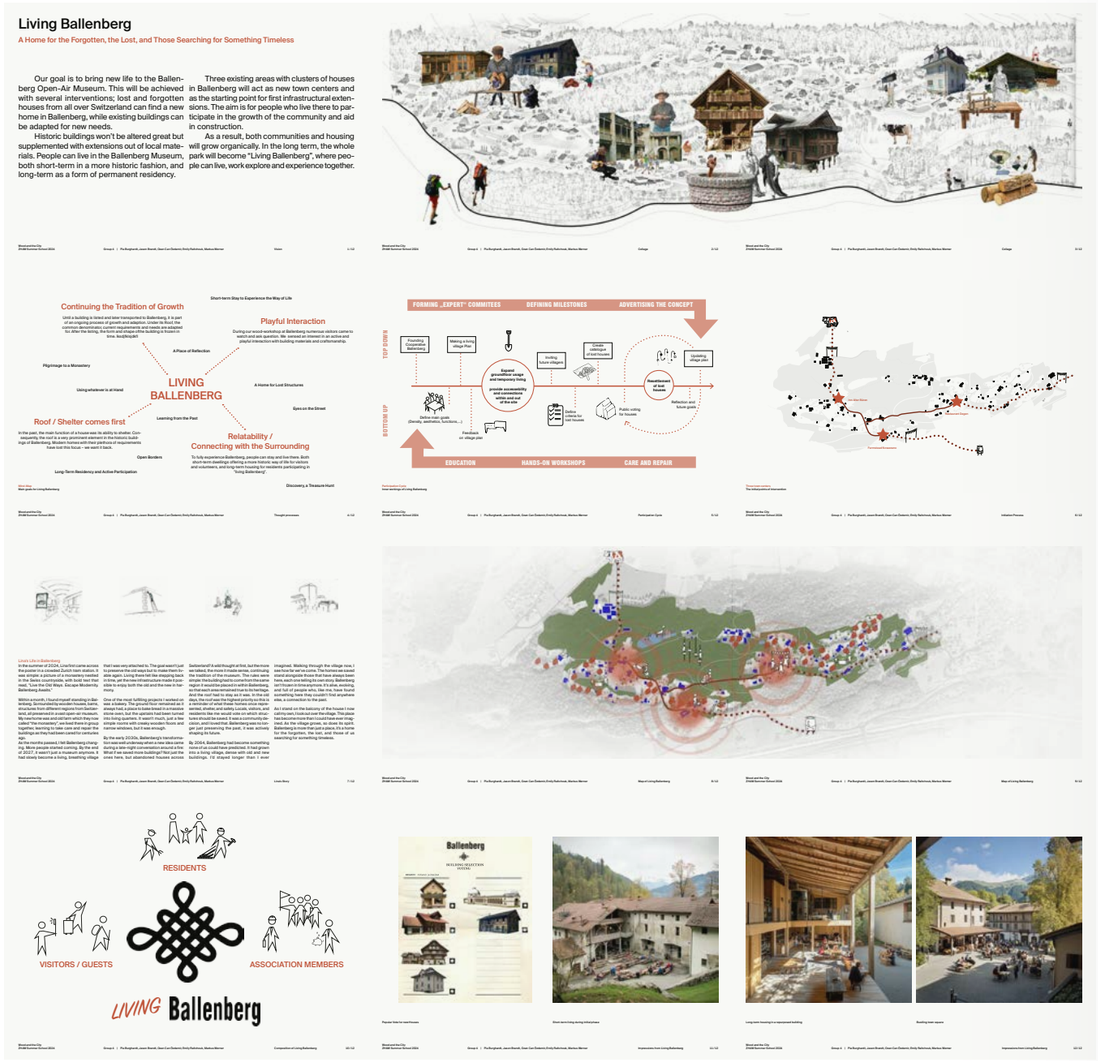












Group 4, Poster reduction
Living Ballenberg

04.4
Final Student Work

Living Ballenberg
A Home for the Forgotten, the Lost, and Those Searching for Something Timeless

Pia Burghardt, Jason Brandt, Ozan Can Özdemir, Emily Raltchouk, Markus Werner

Our goal is to bring new life to the Ballenberg Open-Air Museum. This will be achieved with several interventions; lost and forgotten houses from all over Switzerland can find a new home in Ballenberg, while existing buildings can be adapted for new needs.

Historic buildings won't be altered great but supplemented with extensions out of local materials. People can live in the Ballenberg Museum, both short-term in a more historic fashion, and long-term as a form of permanent residency.

Three existing areas with clusters of houses in Ballenberg will act as new town centers and as the starting point for first infrastructural extensions. The aim is for people who live there to participate in the growth of the community and aid in construction.

As a result, both communities and housing will grow organically. In the longterm, the whole park will become "Living Ballenberg", where people can live, work explore and experience together.

Short-term Stay to Experience the Way of Life

Continuing the Tradition of Growth

Until a building is listed and later transported to Ballenberg, it is part of an ongoing process of growth and adaption. Under its Roof, the common denominator, current requirements and needs are adapted for. After the listing, the form and shape ofthe building is frozen in time. lksdjfklsjdkfl

Playful Interaction

During our wood-workshop at Ballenberg numerous visitors came to watch and ask question. We sensed an interest in an active and playful interaction with building materials and craftsmanship.

A Place of Reflection

Pilgrimage to a Monastery

LIVING BALLENBERG

Using whatever is at Hand

A Home for Lost Structures

Eyes on the Street

Learning from the Past

Roof / Shelter comes first

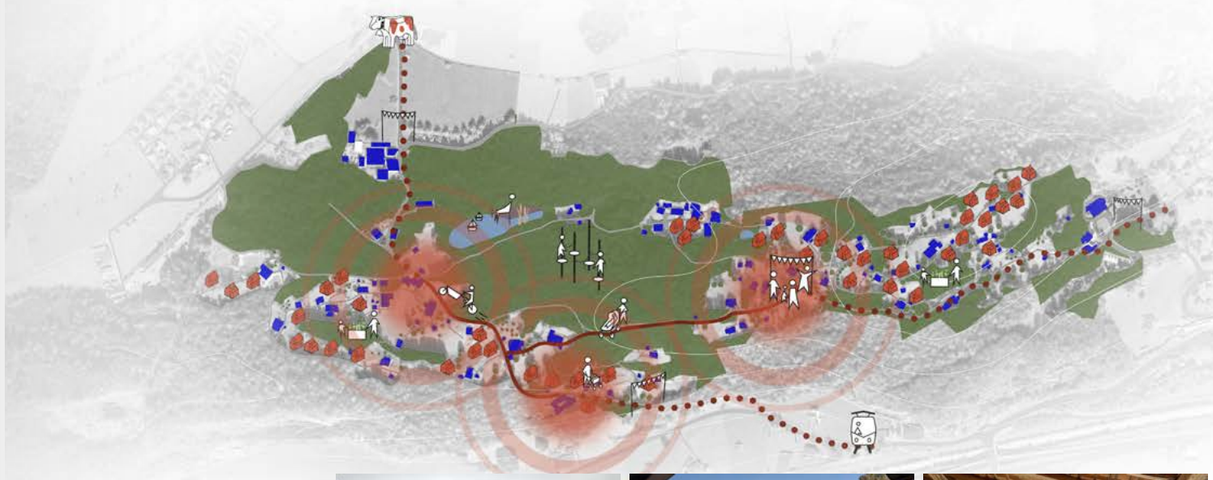
In the past, the main function of a house was its ability to shelter. Consequently, the roof is a very prominent element in the historic buildings of Ballenberg. Modern homes with their plethora of requirements have lost this focus – we want it back.

Open Borders

Relatability / Connecting with the Surrounding

To fully experience Ballenberg, people can stay and live there. Both short-term dwellings offering a more historic way of life for visitors and volunteers, and long-term housing for residents participating in "living Ballenberg".

Long-Term Residency and Active Participation



05
Students, Faculty and Contributors

Participants

A heterogeneous group of students from all over Europe came together for the 2024 Summer School of ZHAW School of Architecture, Design and Civil Engineering:

Angst Jasmin, CH
Baur Lukas, CH
Brandt Jason, CH
Breidert Thomas, DE
Burghardt Pia, DE
Colin Paola, MEX
Dupont Martin, CH/DE
Fritsch Melina, AUT
Gruber Carina, AUT
Keller Simon, CH
Kerkhofs Ilke, BE
Müri, Camil, CH
Özdemir Ozan Can, TUR
Raltchouk Emily, BE
Redjepi Emira, CH
Salewski Nis, DE
Savaliya Rajan, IND
Werner Markus, CH

Experts

The Summer School was assisted by an international group of experts, who provided inputs in the form of lectures and open discussions or served as guest critics.

Lars Müller

Lars Müller, born in Oslo in 1955 and a Norwegian citizen, has been based in Switzerland since 1963. After becoming a graphic designer in Zurich, extended travels, and a one-year assistant position with designer Wim Crouwel in Amsterdam, Müller

established his studio in Baden/Switzerland in 1982. In 1983, Müller published his first book and as Lars Müller Publishers, with offices in Zürich, has produced some 600 titles to date.

Mario Rinke

Mario is a Professor at the Faculty of Design Sciences at the University of Antwerp. Trained as a structural engineer, he teaches and researches structures and construction in architecture. Genuinely interested in materials, making, and adaptability, he investigates the sustainable use of spaces and materials after working as a design engineer for major offices in London and Zurich. Mario Rinke holds a Diploma in civil engineering from the Bauhaus University Weimar and a PhD from ETH Zurich. He was a senior researcher and lecturer at ETH Zurich and the Lucerne University of Applied Sciences and Arts.

Alessandro Tellini

Alessandro Tellini is the Director of the Rapid Architectural Prototyping Laboratory at the Department of Architecture at ETH Zurich. He is a maker, designer, and lecturer at ETH Zurich and UAntwerp. With a background in design, Alessandro has developed a keen interest in fabrication and construction. He has applied his practical knowledge to a wide range of projects, including architectural model-making, product development, the fabrication of large-scale architectural prototypes, and research in the field of didactics and the pedagogy of making.

Andrea Frangi

Andrea Frangi has been Professor of Timber Structures at the Institute of Structural Engineering at ETH Zurich since 2010. He received his degree in civil engineering from ETH Zurich in 1995. Subsequently, he was a research assistant at the Institute of Structural Engineering and Construction. In 2001, he received his doctorate in technical sciences from ETH Zurich. From 2001 to 2003 he was project manager at Read Jones Christoffersen in Vancouver, Canada. From 2004 to 2009 he worked part-time as a project manager at the firm Marchand + Partner in Zurich and as a senior assistant at the Institute of Structural Engineering at ETH Zurich.

David Klemmer

David Klemmer is an Austrian architect based in Zurich. Since 2010 he has been working as a CGI artist constructing virtual scenarios in collaboration with renowned architecture offices.

David Klemmer studied architecture at the University of Applied Sciences Joanneum and at the Technical University in Graz. In 2017 he opened his own studio for architecture. In 2022 he established Studio Diode as an independent satellite dedicated to digital images.

Catherine De Wolf

Catherine De Wolf (Prof. Dr. ir. arch.) is Assistant Professor of Circular Engineering for Engineering at the Swiss Federal Institute of Technology Zurich (ETH Zurich). After studying Civil Engineering and Architecture in Brussels, she obtained her PhD from the Massachusetts Institute of Technology (MIT). She is part of the Centre for Augmented Computational Design in Architecture, Engineering and Construction (Design++), ETH AI Center and NCCR on digital fabrication.

Lukas Ingold

Lukas Ingold is an architect based in Zurich, Switzerland. He completed an apprenticeship as an architectural draftsman (2000–2005) and then studied architecture at the Bern University of Applied Sciences (BA 2006–2009) and ETH Zurich (MSc 2009–2012). He graduated with a doctorate from ETH Zurich under the supervision of Prof. Dr. Joseph Schwartz (Dr. sc. 2016–2022). At ETH Zurich, he worked as a lecturer and carried out various research projects (2014–2023). Furthermore, he gained practical experience in various architecture offices, among others, with Christian Kerez in Zurich (2012–2014). In 2014, he established his own practice.

Helene Romakin

Helene Romakin is a cultural scientist and independent curator. In her work Romakin focuses on practices of artistic research, situated knowledges, and role of fiction in academic writing. In 2023, she successfully completed her PhD titled “Narrating the Anthropocene in Art, Architecture, and Film in Works by Lara Almarcegui, Andrei Tarkovsky, and Peter Zumthor” at ETH Zurich. www.heleneromakin.com

Andreja Kutnar

Andreja Kutnar is a full professor in the field wood science at the University of Primorska in Koper, Slovenia and director of the InnoRenew CoE. She was an Executive Board member of InnovaWood for six years and in the years 2020/2021 president of the Society of Wood Science and Technology Executive Board.

Her areas of expertise include wood composites, therm- hydro-mechanical treatment of wood, and adhesive bonding. Her work focuses on research projects in the fields of natural science, technology, sustainable development of the wood industry, environmental impact assessment of new materials, products, and technologies from origin, manufacturing, use/alteration to reuse or recycle. For the wood industry, she performs life cycle assessments (LCA) and advises on improving environmental impacts across the wood value chain.

Guest experts

A second group of guest experts is formed of professors and faculty from the ZHAW. They will join the Summer School at the final presentation.

ZHAW

Regula Iseli

Prof. Regula Iseli (*1962) is an architect (dipl. Architektin ETH SIA). After her studies at the ETH Zurich (diploma 1989) she has been working as independent architect and as partner in different project teams (1993 – 2002). From 1994 – 1995 she worked as a teaching assistant at the design studio Prof. Alfredo Pini ETHZ and from 1996 – 2002 as a teaching assistant at the design studio Prof. Adrian Meyer/Ruggero Tropeano ETHZ. In 2002 she joined the Amt für Städtebau Stadt Zürich (Office for Urban Planning City of Zurich) where as a project leader she was responsible for urban and architectural quality until 2013. The same year she became tutor at the Institute for Urban Landscape at the ZHAW, School of Architecture, Design and Civil Engineering. Since 2014 she leads the Institute for Urban Landscape ZHAW together with Stefan Kurath.

ZHAW

Stefan Kurath

Stefan Kurath (*1976) works as an architect and urbanist in his office in Zurich and Graubünden; together with Regula Iseli he heads the Institute of Urban Landscape at the School of Architecture, Design, and Civil Engineering of the ZHAW, where he is also a professor. He thinks, writes, researches, and teaches on urban landscapes and architectural practice. His latest book is Jetzt: die Architektur! Über die Gegenwart und Zukunft der architektonischen Praxis [Now: the Architecture! On the Present and Future of Architectural Practice] published by Park Books (2022). His next book will appear in autumn 2024 with the title Baukultur mit Bestand, published by Triest Verlag.

Team

The ZHAW Summer School 2024 is co-organized by Thomas Hildebrand, Celina Martinez-Cañavate and Carla Ferrer, architects and urban designers involved in academia, research and practice. In 2022, they co-curated the exhibition *Touch Wood* at the Center of Architecture in Zurich, and co-edited the book *Touch Wood. Architecture, Material, Future* published by Lars Müller Publishers.

Thomas Hildebrand

Thomas Hildebrand is an architect and the founder of HILDEBRAND in Zurich. He studied at the Architectural Association, School of Architecture in London and at the Bern University of Applied Sciences. Since founding his practice in 1999, he has been exploring the use of timber in architecture. His work has won awards such as the North American Wood Design Award and the German Design Award. After many years of teaching at the ETH Zurich, he now teaches at the ZHAW Winterthur at the Institute of Urban Landscape.

Celina Martinez-Cañavate

Celina Martinez-Cañavate is an urbanist and architect. She studied at the Architectural Association, School of Architecture in London and at the ETSAM in Madrid. Prior to joining the board of directors of HILDEBRAND, she worked for several years at ETH Zurich and the University of Liechtenstein, where she earned a PhD in architecture and planning. She has given seminars and curated exhibitions, including the Future Cities Laboratory international conference by the Singapore-ETH Centre for Global Environmental Sustainability (SEC), the Venice Biennale of Architecture, and the Kunstmuseum Liechtenstein.

Carla Ferrer

Carla Ferrer is an architect and urbanist. She graduated from Harvard GSD and the Polytechnic University of Catalonia (ETSAB), and is a founding partner of ITER, an architecture studio in Milan. Awards include the Ikea Swiss Foundation Grant for Design Studies and a Real Colegio Complutense Scholarship from the Spanish Government. Since 2012, Ferrer has been collaborating with HILDEBRAND in Zurich. In 2016, she joined the Ecological Urbanism Collaboration at the University of Beijing, and recently held research appointments at the Polytechnic University of Milan. Ferrer is engaged in urban design and collective housing projects in Italy, Spain and Switzerland.

“The course helped me see the interconnectedness of materials, economy, ecology, and humanity. I realized again how crucial collaborations are, and that this should ideally be emphasized during architecture studies. This helps us better grasp the complexity of the work we're doing as architecture students.”

“The Summer School mainly reinforced my belief that an architect must deeply understand the materials and processes they work with.”

“I now want to build more with wood, but with an emphasis on asking why and how. Where does the material come from? Who is it for? And how can we get the most out of it?”

“The Summer School reminded me that as an architect, you have a responsibility for the future of the earth. You can greatly influence the environment with the buildings you design.”

06
Student Voices
How has this course influenced your position as an architect?

“The course made me focus even more on designing for reversibility, which is key for longevity in architecture.”

“The Summer School made me think differently about wood in construction, especially regarding "massive" variants like Brettstapel or CLT. I also learnt that wood should be used smartly is the future — not using as much as possible just to claim a new building is green and sustainable.”

Imprint
Wood and the City
ZHAW Summer School 2024
Final Report, September 2024

Zürcher Hochschlue für Angewandte Wissenschaften
Architektur, Gestaltung und Bauingenieurwesen
Institut Urban Landscape

Team
Thomas Hildebrand
Celina Martinez-Cañavate
Carla Ferrer

Student's contributions
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Design
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