Re-Use Huber Pavilion's Materials

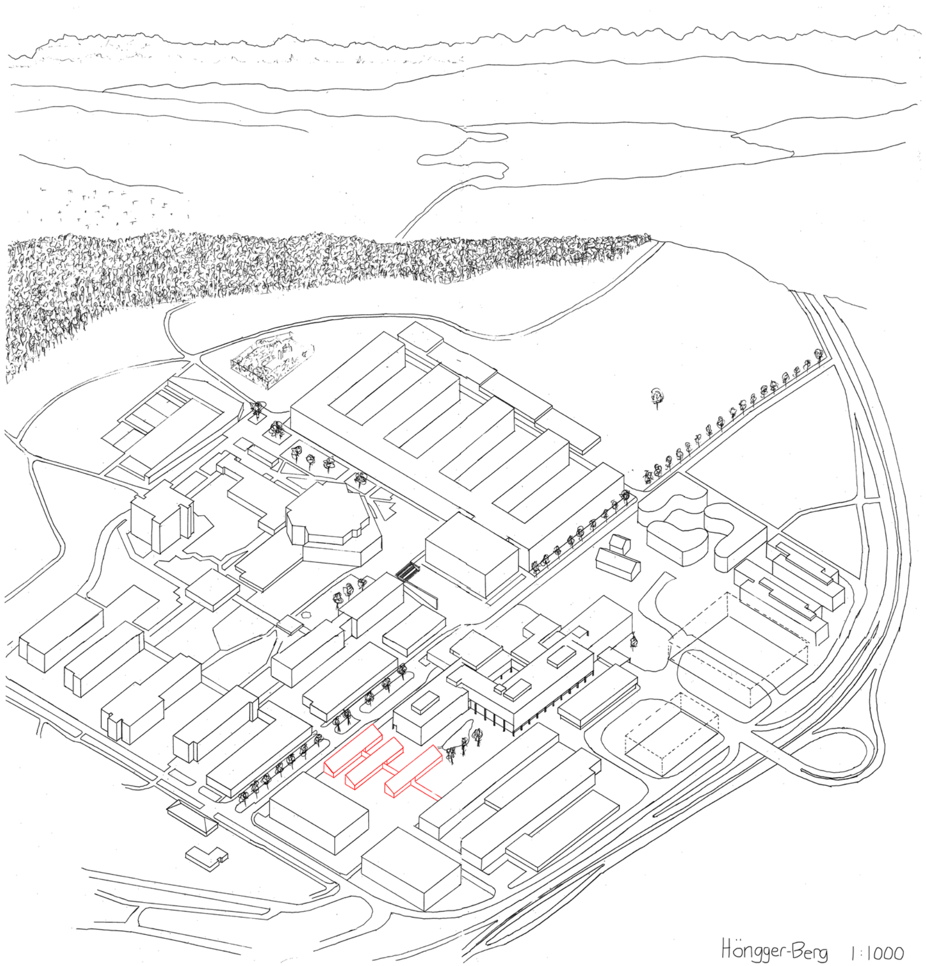
Reader

Chair of Architectural Behaviorology
Chair of Circular Engineering in Architecture
Focus Work FS23
ETH Zurich

CONTENTS

Architectural Behaviorology being a design theory and methodology that we have adopted with the objective of rediscovering the forgotten values of resources through the lens of ethnography. In essence it tries to find existing barriers and deficits and then challenge them in order to create better accessibilities to local resources. The aim is to activate the behaviors of actors, both human and resource, to create urban-rural commons and rejuvenate community livelihoods with smallscale primary industries, based on scenarios in Switzerland.

Using the core design approach of architectural behaviourology the research project advocates and demonstrates, both theoretically and in real-world practice, the significance of creating urban-rural commons to rejuvenate community livelihoods with small-scale primary industries (farming, fisheries, and forestry), taking both Asia (Japan) and Europe (Switzerland) as geographically distant yet mutually applicable and promising applied settings.



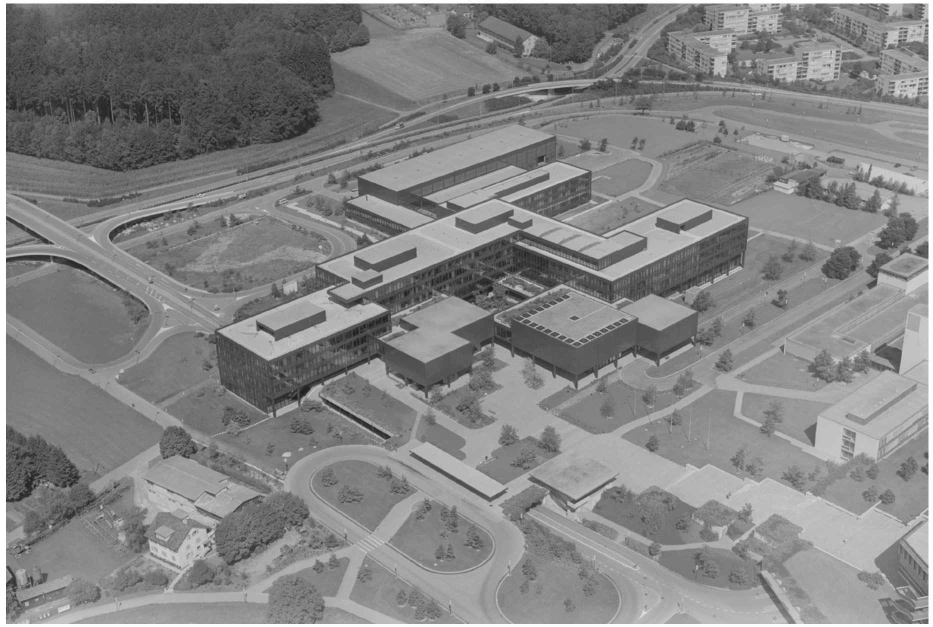
Img. 01: Axonometric View of ETH Campus Hönggerberg and Huber Pavilions (red)

The first construction on ETH Campus Hönggerberg started in 1964, when first concrete buildings were built for the department of physics. These building are today at the end of their first life-cycle and the physics department requires additional space.

Many more new buildings have been constructed since, continuing in 1974 with the HIL and HIF buildings by Max Ziegler and Eric Lanter and between 1996-2004 the chemistry building HCI by Mario Campi.

Between 1987 and 1991 the three pavilions were planned and built by Atelier 3 and Rudolf Bolli for the client, architecture professor Prof. Benedikt Huber. The pavilions were conceived as 130 temporary learning spaces for architecture students. The department needed additional spatial resources because it was experiencing a growing number of student enrollments. The Huber pavilions were initially planned to allow future dismantling and re-use.

Img. 02: First construction phase on ETH Campus Hönggerberg, 1964



Img. 03: View of second construction phase on ETH Campus Hönggerberg, 1977

FOCUS WORK

The pioneering focus work "Re-Use Huber Pavilion's Materials" has the unique opportunity to work with saved building components of the Huber Pavilions. These were demolished in the summer of 2022 to make way for the construction of a new physics building. The goal of the course is to construct a re-use pavilion.

The focus work collaborates with the Spring Course "Digital Transformation for Circular Construction" supervised by Prof. Catherine De Wolf and the Chair of Circular Engineering in Architecture (CEA), as well as experienced experts, as Barbara Buser, Pascal Angehrn from baubüro insitu, and Michael Wick of Wiederverwerkle. The goal of the focus work is to design and prepare the construction of a re-use pavilion on campus and will be supervised by the Chair of Architectural Behaviorology.

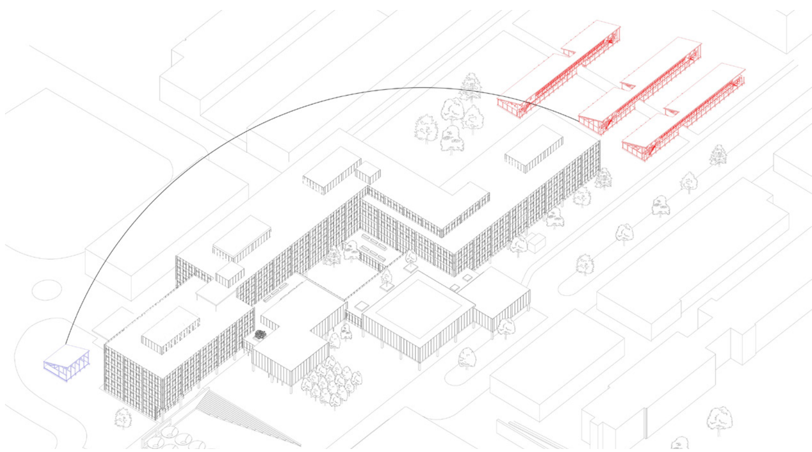
All D-ARCH students who do the focus work are responsible for the design, all other students inthe CEA course support them using the technologies learned in class and during construction in June.

The design is the biggest task and hence is carried by a group of 12 architecture students, who consult with the rest of the students and experienced supervision.

The submissions required for the focus work are separate to the assignments in the CEA spring course and will be credited with additional 6 ECTS.

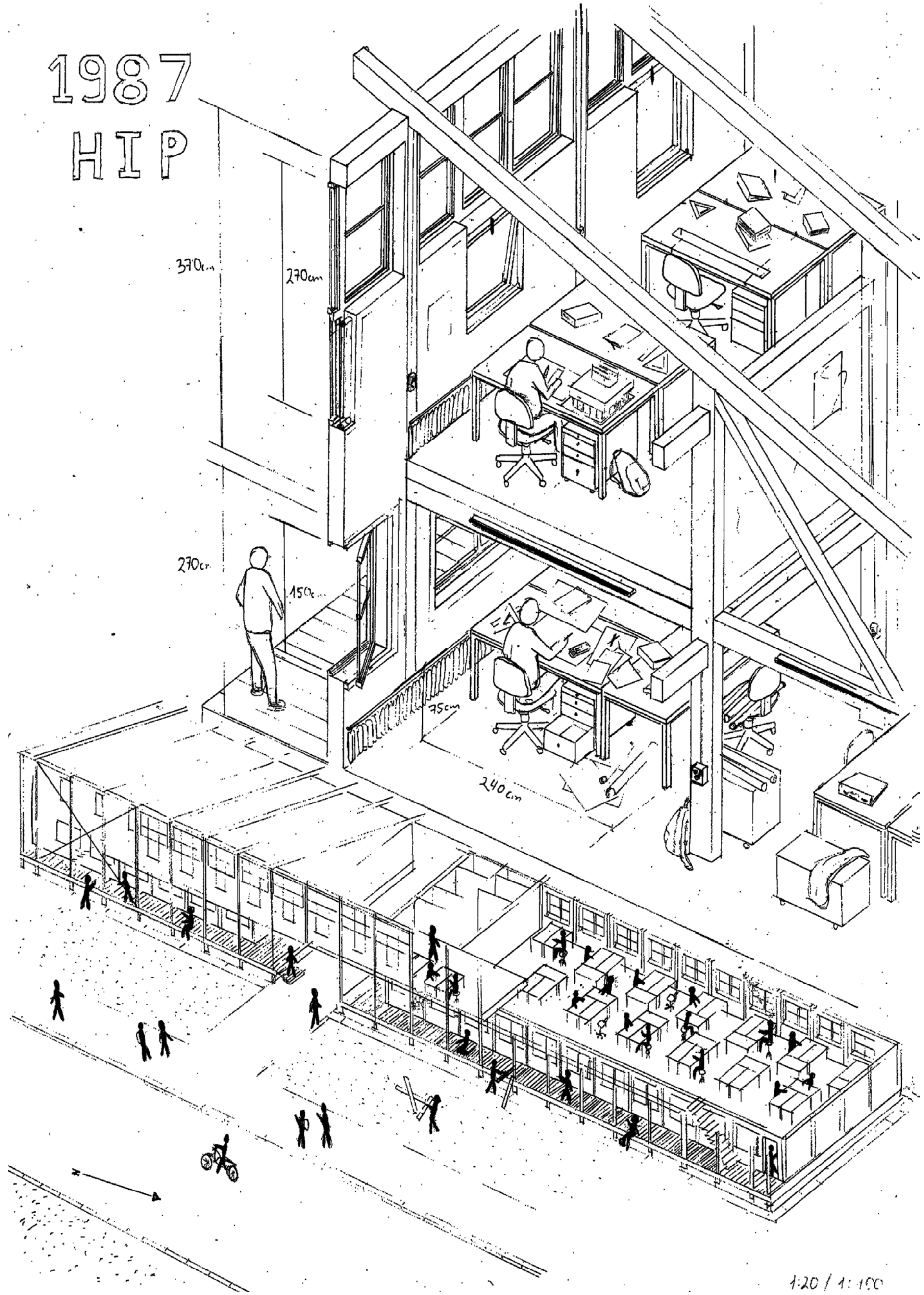
The focus work amounts to a total of 180 hours. These hours are approximately divided as follows:

• Inventory -	10 hours
• Design competition -	30 hours
• Preparation -	15 hours
• Construction -	85 hours
• Drawing Report -	40 hours
Total -	180 hours = 3 weeks



Img. 04: Huber pavilions (red) and re-Use pavilion (blue)

HUBER PAVILIONS



Img. 05: Axonometric view of Huber pavilions

RESEARCH OBJECT

Background

The research object "Re-Use Pavilion" aims at the preservation and pioneering reuse of the former so-called Huber pavilions on the ETH Hönggerberg campus.These had to make way in 2022 for the construction of a new building for the Department of Physics (D-PHYS). During the demolition of the pavilions, some materials were obtained and are currently located as dismantled individual parts in an interim storage facility on the ETH Hönggerberg campus.

Reuse

The construction industry plays an essential role in meeting todays climate targets. In replacement construction projects, the demolition of existing buildings results in a large amount of construction waste. The research object at ETHZ tests the construction with reused components and thus makes an important research contribution to the topic of circular construction industry and sustainability.

Research process

Construction with reused components is tested in a pioneering research project. The construction work, which is limited to a 12x12m perimeter, will begin in the summer of 2023 and end after a 3-year period, in 2025, with the dismantling of all structures and the restoration of the existing, intact green space. A building area of approx. 140 m2 has been offered by ETH Immobilien.

Img. 06: Demolition of Huber pavilions

Material concept

All available building components originate from the former Huber pavilions. Most iconic are the white wooden trusses in addition to wooden roof panels, windows, doors, sanitary installations, radiators, stairs, formwork boards and ground coverings made of cement and brick.

Structure

The research object will be executed as a lightweight construction with reused wooden beams, the type and shape of which is not yet known. The final design and execution of the object will be accomplished by supervised students of ETH. The research object will be designed as a minor complex structure, as no building services such as water and electricity supply or ventilation systems will be installed. Further, the research object will be designed as an open, walk-in pavilion and cannot be closed off for fire protection reasons. The building will be constructed partially free of obstacles by means of wheelchair-accessible flooring.

Mock-up

The material concept, the physical weight of the components and the difficulties of connecting them in a force-fit manner have once been tested on a mock-up, which is temporarily located on the construction site, which has already been fenced in.

Construction process

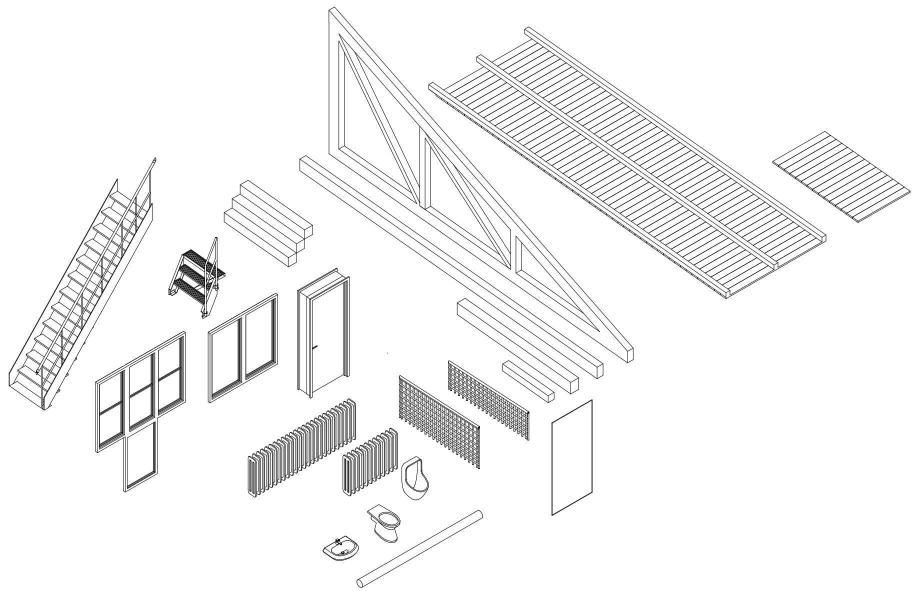
The two departments of Architecture (D-ARCH) and Civil, Environmental and Geomatic Engineering (D-BAUG) are working together with professional supervision by baubüro insitu ag and Wiederverwerkle GmbH to ensure the reuse of materials in a qualitative manner. The constructional implementation of the research object is being carried out by students within semester courses with Prof. Momoyo Kaijima and Prof. Catherine De Wolf. The students will be professionally supervised on site. A close exchange is maintained with the internal security body of the ETH, the SGU. Preliminary work is planned in April, as well as a two-week construction period in June 2023.

Img. 07: Group workshop

LEARNING GOALS

Students will work with re-use materials of the former Huber Pavilions at ETH Campus Hönggerberg. By the end of the course students will have achieved the following learning goals:

1. Inventory (March)
2. Design (March)
3. Preparation (April)
4. Construction (June)
5. Drawing Report (July)



Img. 08: Axonometric view of re-use materials

ASSIGNMENTS

1. INVENTORY

In order to properly build with re-used materials, a database of the available stock of materials, their condition and properties is needed. For this, students will undertake the following steps:

- Visit material storage
- Identify building materials
- Study existing inventory excel sheet
- Study existing 1:1 mock-up on site
- Take measurements
- Count available material

Title: Create catalogue of re-use

Workload: approx. 10 hours

Type: Group workshop

Submission date: March 19

Formats: PDF, Excel Sheet, JPG

Upload: https://polybox.ethz.ch/index.php/s/PWv8H5MXcHjQHCM

Img. 09: Material storage area at ETH Campus Hönggerberg

2. DESIGN COMPETITION

Propose a design solution for a new re-use pavilion on the construction site next to the HIL building. While making your draft, respect the following rules:

- Respect building perimeter (12x12m) next to HIL
- Consider all available materials in storage
- Plan for short construction period (10 days!)
- Allow future semesters to continue construction
- Include concept for future disassembly
- No electrical heating-, or plumbing systems
- Collaborate with D-BAUG students in CEA

Title: Design

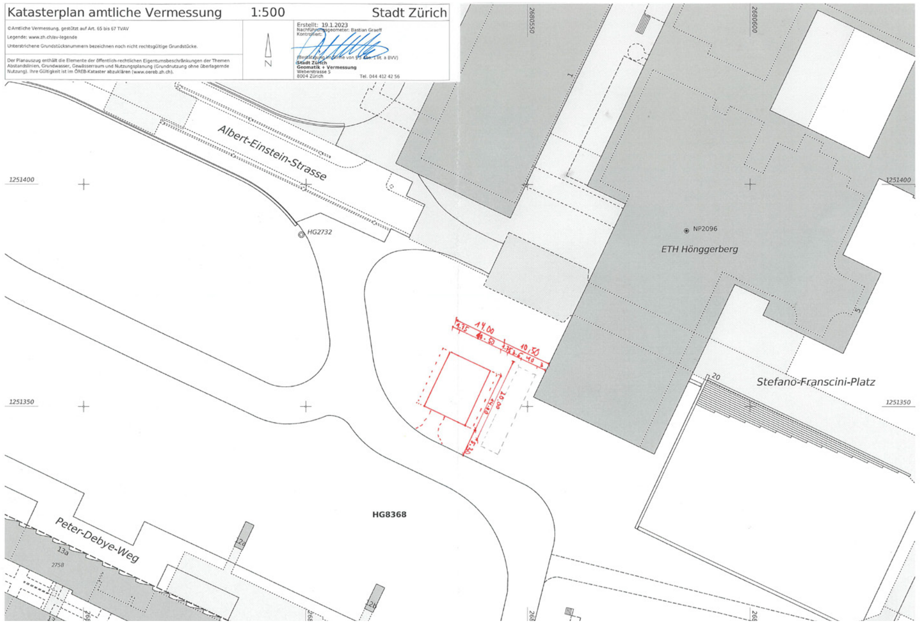
Workload: approx. 80 hours

Type: Individual work or groups of two

Submission date: March 30

Accepted formats: hand drawings, CAD, images, visualisation / model (1:33)

Upload: https://polybox.ethz.ch/index.php/s/PWv8H5MXcHjQHCM



Img. 10: Construction site next to the HIL building, Katasterplan

ASSIGNMENTS

3. PREPARATION

Students will prepare the building site and -process and will undertake necessary steps to finalize the design proposal and construction plans respectively.

- Preparation of materials, site and groups:
- Prepare foundation, walls and roof
- Create a schedule of building activities
- Familiarize with SUVA safety check lists
- Create a safety protocol for the construction site
- Form groups for the construction period:
- (Floor / Walls / Roof)

Title: Preparation

Workload: approx. 15 hours

Type: Group workshop

Submission date: June 12

Accepted formats: drawings, text, images, visualisation / models / mock-up

Upload: https://polybox.ethz.ch/index.php/s/PWv8H5MXcHjQHCM

Img. 11: Storage area and construction site with mock-up

4. CONSTRUCTION

In collaboration with students of different ETH departments you will direct and execute the construction of a re-use research object at ETH Hönggerberg campus. In this phase there will be 3 groups:

Group 1 : Floor / Group 2: Walls / Group 3: Roof

Each group delegates one student responsible for:

- Coordination and safety on site
- Maintenance of tools
- Process documentation
- Plans and drawing

Title: Construction

Workload: approx. 80 hours

Type: Group workshop

Dates: June 19-29 + Vernissage: June 30

All materials generated (drawings, images, film) will be uploaded here:

Upload: https://polybox.ethz.ch/index.php/s/PWv8H5MXcHjQHCM

Img. 12: Carpentry work with Huber pavilion’s materials

5. DRAWING REPORT

After the completion of the construction phase students are asked to review the experienced process and produce a drawing report. See references of previous student reports in the appendix (page 46-50).

- Submit a drawing report on 4 x DIN A3 about your experience and contribution during this course. Highlight one architectural element of the re-use pavilion as part of the three groups floor, walls and roof.
- Include drawings (scale 1:1-1:50) and text (200-600 words) which represent the re-use project from your personal perspective. This may include sketches/ figures/ floor plans/ elevations / sections / isometric views / perspective views / details / visualizations or images.

Title: Drawing Report

Workload: approx. 40 hours

Type: Individual work

Submission date: July 30

Accepted formats: PDF

Upload: https://polybox.ethz.ch/index.php/s/PWv8H5MXcHjQHCM

Img. 13: Department of architecture in ETH Main Campus, 1930

SCHEDULE

SCHEDULE

Week	Assignment	Date	Time	Program	Goals	Deliverable	Type	Workload
KW 10	1. Inventory	Mar. 6	15:00 -17:00	15:00 Introduction & Input Lecture 16:00 Material Storage	Visit material storage Identify building materials Study existing inventory excel sheet	-Library of Re-Use	Group workshop	10 hours
		Mar. 13	14:00-17:00	Open format desk crit (voluntary)	Create catalogue of re-use			
KW 11	2. Design	Mar. 20 March 27	14:00 -17:00 14:00- 17:00	Seminar Week (voluntary) Open format desk crit (voluntary)	- Material concept -Project concept	- Concept Sketches - Drawings (Plan, Section, Elevation, Detail) -Format: 4 x A3 - Structural Model, Scale 1:33 - Text (3 min / ca. 300 words)	Individual work	30 hours
KW 12		Mar. 30	18:00	Submission				
KW 13		Apr. 3	14:00 -17:00	REVIEW with Prof. Catherine De Wolf Barbara Buser, baubüro insitu, Wiederverwerkle				
KW 15	3. Preparation	Apr. 17 - May 8	14:00-17:00	Open format desk crit (voluntary)	-Project concept -Safety Plan -Selection of proposals -Group forming	-Schedule -Protocol - Detailed Drawings (Plan, Section, Elevation, Detail)	Group workshop	15 hours
		Jun. 12		Submission	-Detailed Design			
KW 25	4. Construction	Jun. 19 - Jun. 23	09:00-17:00	Introduction Safety protocol Carpentry workshop	Construction of re-use pavilion	On site presence	Group workshop	85 hours
KW 26		Jun. 26 -Jun. 30	09:00-17:00	Construction (Floor, walls, roof) Clean up	Vernissage on June 30, 18:00			
KW 30	5. Drawing Report	4 weeks	individual	Open format desk crit (voluntary)	Summarize your learning experience in text and representation	Text (200- 600 words) Drawings Images	Individual work	40 hours
		July 30	18:00	Submission				

SUBMISSION GUIDELINES

For Reviews we ask you to submit all the data of your project on the Polybox folder, following the guidelines here below.

Submission of scans

- Please submit each drawing (if several) as separate file
- PDF format only (no multiple layers, no multipage files)
- Mind the scanner settings when scanning the drawings (Contrast, DPI) so no details will be lost.

Submission of images

-Please save each image (renderings, collages, visualizations, model photos, etc.) as separate file.
- JPEG format only
- Resolution: at least 5 Megapixels

Filenames

- Please name all files in the following format:

"YYMMDD_TBW_Event_Surname Name_Description.pdf"
Date of hand-in: YYMMDD (Year, Month, Day) For example 15th of March 2020 --> 200315
Three letter code of the semester: TBW
Event: Midreview, Final Review
Name: Surname Name
Description: Plan, Section, Elevation, Report etc

Example: 210718_TBW_Midreview_Muster Max_Plan.pdf

Access to Server

You will submit all the data by saving them in the polybox folder of our chair, accessible at the following path:
https://polybox.ethz.ch/index.php/s/PWv8H5MXcHjQHCM

Submission deadlines

All drawings, model photos etc have to be submitted on time. The deadline is the day before review at 15:00 (17:00 in case of the Final Review). Submission deadlines have to be kept. If out of technical reasons, a submission can not be done, please contact the assistants before submission deadline.

GRADING SHEET

Grading Structural Behaviorology Workshop - Chair of Architectural Behaviorolgy 2022

Student: Eveline Example Date: 13/08/2022

Prof. / Assistant

Hand in	Criteria (Syllabus and Reader)				Maximal Points	Received Points	Grade	Grade Average
1st submission Individual work (30%)	Submission* Layout (A3×4, A4×1)	Plan(s)	1:1-1:5	4,00	0,80	0,80		
		Section(s)	1:1-1:5		0,80	0,80		
		Elevation(s)	1:1-1:5		0,80	0,80		
		Graphic statics	1:1-1:5		0,80	0,80		
		Reading review (text)	500 words		0,80	0,80		
	Understanding of Architectural Behaviorology				0,40	0,10		
	Research Method				0,40	0,15		
	Visualizatoin				0,40	0,20		
	Clear and comprehensible arguments (text)				0,40	0,20		
	Focusing the topic and Originality (text)				0,40	0,10		
	Submission delay				-0,25	-	4,75	4,75
Final submission Individual work (70%)	Submission* Layout (A1×1)	Participation in group work		4,00	-	-		
		Analysis diagram	1:1-1:5		3,00	3,00		
		Analysis (text)	500 words		1,00	1,00		
	Understanding of Architectural Behaviorology				0,40	0,10		
	Research Method				0,40	0,25		
	Visualizatoin				0,40	0,30		
	Clear and comprehensible arguments (text)				0,40	0,30		
	Focusing the topic and Originality (text)				0,40	0,30		
	Submission delay				Fail	-	5,25	4,72
Average 1st S + FS							5,10	4,73
Final Grade							5,00	

*The submission will be judged on whether it has been submitted with the minimum quality of the content.
If everything is submitted on time, student will get 4 points.

Absence: 06.09.

Conclusion:

Student Signature:

Img. 14: Kopfbau Halle 118

On the Sulzer site in Winterthur, the Abendrot Foundation created a beacon for climate-friendly and sustainable building that shimmers red in its reused profiled sheet metal cladding. The extension of the head building of Hall 118 for 12 studios, think tanks and a creative laboratory on the first floor was made mainly from re-used building materials.

“All things that are already there plus wood, straw and clay”.

Radically formulated, these materials are available for climate-friendly construction methods. Because of great advances in building operation, construction is now responsible for three-quarters of the emissions in the life of a building. For the K.118, the focus was on reducing this gray energy: 60% of greenhouse gas emissions and 500 tons of primary materials could be saved compared to new building components.

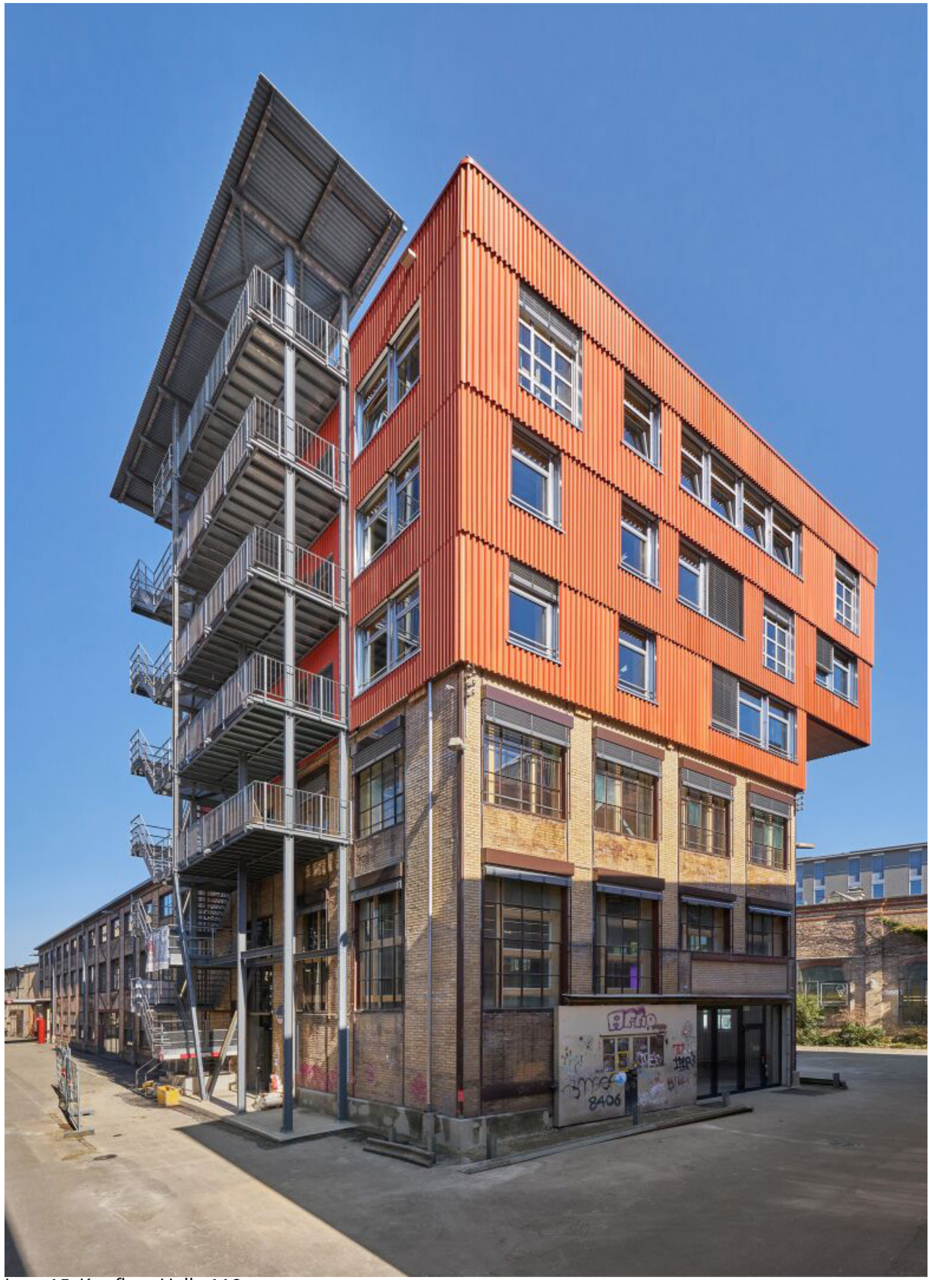
In the pilot project, it quickly became apparent that thinking circularly means thinking in loops: starting with available building components, the planning process turns around: It follows opportunities as they arise and starts with finding materials. Selection is followed by cataloging: In order to reinstall components, we need information and a precise idea of the requirements and installation options. Thus, along the usual planning phases, the design is created in a constant process of weighing, checking and deciding:

A steel skeleton that once supported a distribution center on the Lysbüchel site in Basel forms the supporting structure. Concrete was used only as thinly as necessary and only where it was unavoidable for structural reasons or for sound and fire protection: in the floor slabs, chambered concrete columns and in the foundations. The three new floors built on top of the hall are accessed by the steel exterior staircase from the demolished Orion office building in Zurich. The stair landings determine the floor heights. The granite facades, which have been converted into slabs in the kitchens, toilets and on the balcony arbors, and the majority of the aluminum insulated windows also originate from the Orion building. With the surrounding red facade sheet metal from Winterthur, they protect against the weather and draw the face of the building. Facade sheet metal and the storey-high industrial windows from the neighboring Sulzer Plant 1, which were doubled up to form box-type windows, thus continue to characterize the Winterthur cityscape.

Since material and projected elements are not geometrically related, necessary leeway must be created: Once elements and functions are decoupled in layers, they can overlap and follow their own rules. The scaled facade and visible support structures in K.118 illustrate this. Surrounding reused with adaptable materials is another way: in the prefabricated wooden façade elements, no-cut compartment insulation made of straw bales and interior plaster made of local excavated clay fill the space around the reinstalled windows. Processed with minimal energy, these natural “materiali poveri” remain compostable and provide a comfortable indoor climate. Interior walls made of wood accommodate reused doors and used triple-layer panels from stage construction and score with their adaptability, as do solid wood floors or the roof elements of a temporary wooden structure. Glued wood materials and elements are particularly suitable for repeated use or demand for it, their climate friendliness is far less positive than expected from wood because of the adhesives.

While the CO2 emissions in the construction could be more than halved, the costs remained within the limits of the CT for a similar new building. With the difference that the majority of the expenditure went directly into adding value for the craftsmen involved, because the inexpensive Reuse material requires some manual labor and expertise until it is installed. Sustainability also for the local economy.

- Referenz 088, baubüro insitu ag



Img. 15: Kopfbau Halle 118

Img. 16: Kopfbau Halle 118

KLEINE FREIHEIT
CAFE IN CONTAINERS

"The oasis between Weinbergstrasse and Leonhardstrasse invites you to linger in the middle of Zurich with the charm of the self-made and reused. Since 2013, students from the neighborhood have been offering falafel, mezze and drinks in the old shipping container. The initiators had converted the container into a kitchen and toilet according to our plans at Werkplatz Basislager in Altstetten. When the building code became a challenge for them, we advised them to keep their efforts to a minimum. In 2016, they enclosed the container with a winter garden. Where large machines were needed, they were supported by the carpentry firm BeniHolzbau. The reused elements were collected in the region: The tropical wood floor and the sliding doors were saved from incineration during the demolition of the neighborhood hall on the Friesenberg. The large windows could be dismantled during a demolition. The old garden benches and tables, the wooden boxes and pots full of herbs, as well as the sandbox planted with grass and the many green bushes give the gravel parking lot its unique ambience.

Img. 17: Kleine Freiheit

Img. 18: Kleine Freiheit

RE-USE PAVILION CAMPO
STUDIO BARBARA BUSER FS22

The ReUse Pavilion of the campo site was created as part of the spring semester 2022 in the Studio ReUse, which Barbara Buser led at the Architecture Department of ETH Zurich. The focus was: the reuse of building components as a strategy for sustainable and responsible architecture. The 28 students dismantled 6 to of building material at two deconstruction workshops. After in-depth analysis of the salvaged material, they quickly sketched a joint design for a pavilion. The next day they started building the foundations. The detailing of the design continued to be developed and decided together in an ongoing process. In just under two months, the students built this pavilion themselves from 99.9% recycled building materials. The pavilion is being built by the Foundation for Art, Culture and History (SKKG) and its subsidiary Terresta Immobilien- und Verwaltungs AG. The pavilion is a first step in the activation and transformation of this area, which is to be developed into the headquarters of the foundation in the next 3-4 years. In this context, the pavilion demonstrates the technical and aesthetic potential of a circular architecture of reuse.

Img. 20: Re-use pavilion Campo

Img. 19: Re-use pavilion Campo

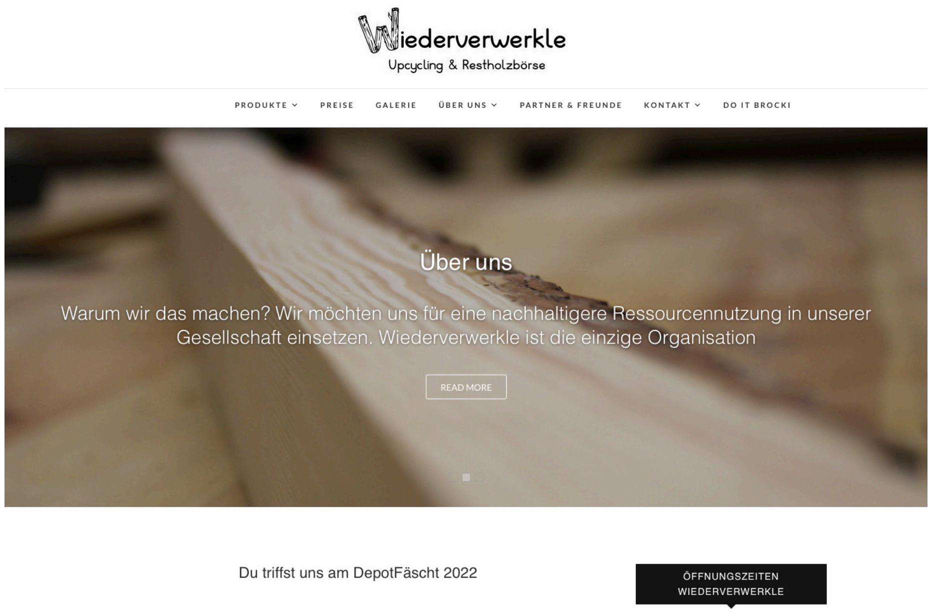
Img. 21: Re-use pavilion Campo

WIEDERVERWERKLE

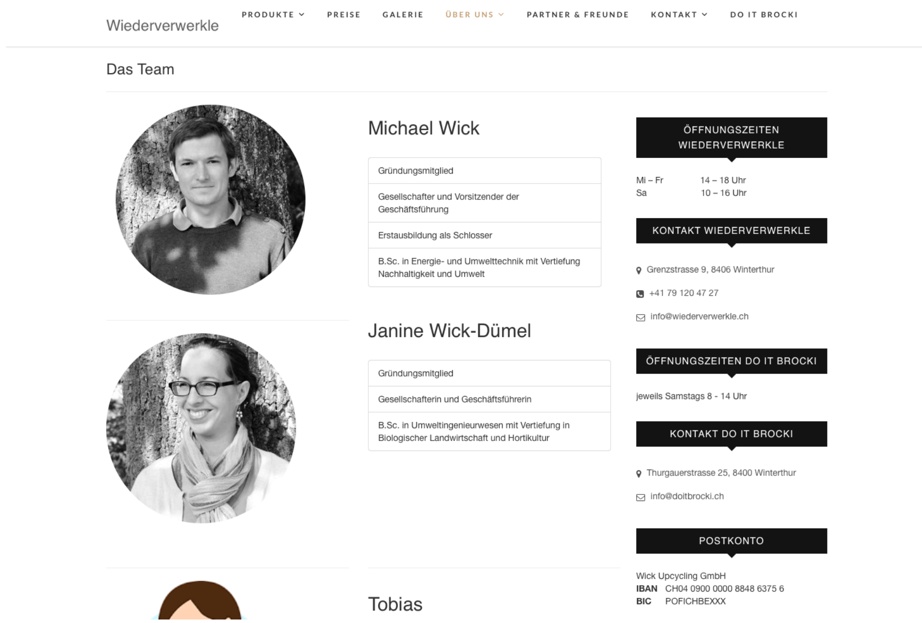
We at wiederverwerkle are committed to a more sustainable use of our resources and offer used wood, metal and upcycled products from them for sale. We want to work for a more sustainable use of resources in our society. Wiederverwerkle is the only organization in Winterthur that offers residual wood for sale at a central location.

The industry would burn the wood, we pick it up and put it to a more valuable use. With your purchase you contribute to a more sustainable use of our resources.

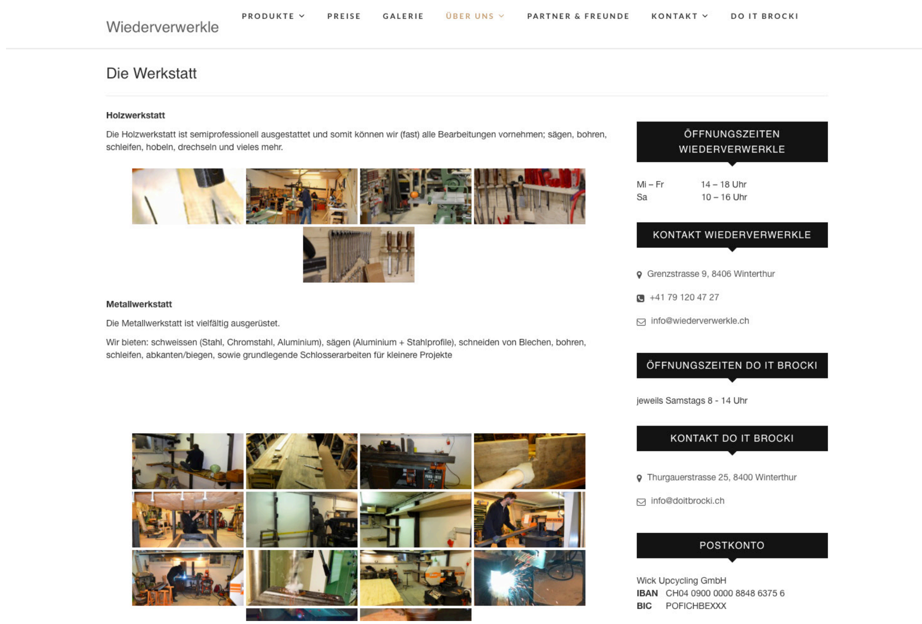
Wiederverwerkle wants to encourage creativity and tries to do so every day. If you have not yet had contact with handicraft activities, we encourage you to do so. This way you can create something useful with your own hands from supposed waste. If you have any questions about the development of your projects, we are of course at your disposal. We wish you a lot of fun developing and executing your ideas!



Img. 22: Homepage of Wiederverwerkle GmbH



Img. 23: Homepage of Wiederverwerkle GmbH



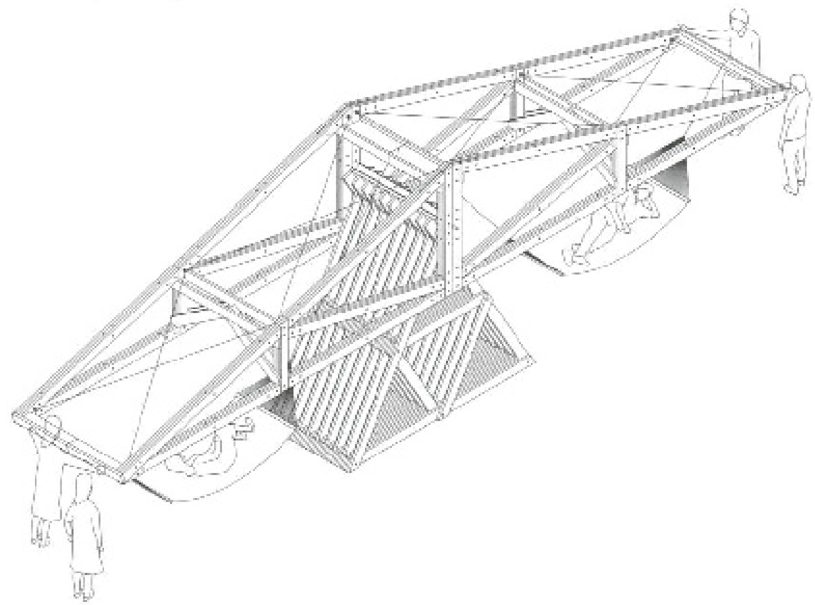
Img. 24: Homepage of Wiederverwerkle GmbH

ATELIER BOW-WOW
HAMMOCK HOUSE LOS ANGELES 2009

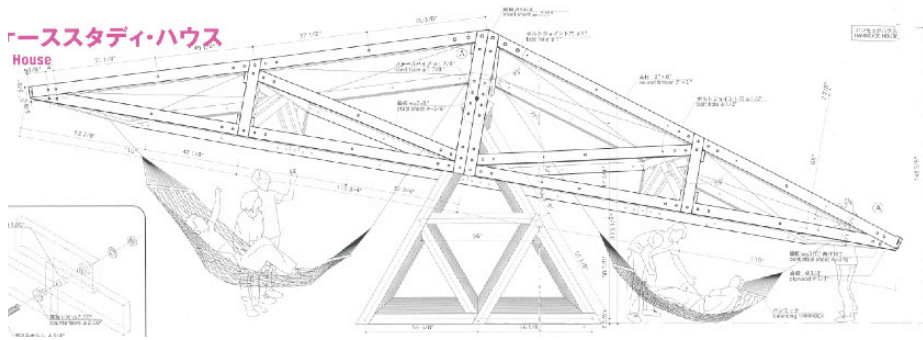
Atelier bow-wow, the Tokyo architecture studio led by Yoshiharu Tsukamoto and Momoyo Kaijima explores the use and function of space within urban environments. Bow-wow developed the term 'pet architecture'—a style of small, ad hoc, multi-functional structures that make the most of limited space, a phenomenon in densely developed cities like Tokyo that integrate need, improvisation and ingenuity.

in its first solo U.S. exhibition, atelier bow-wow shows three micro structures that collectively offer a contemporary spin on the idea of minimal low-cost housing. 'small case study house' consists of 'BBQ coliseum', a circular structure directed toward oil can barbecues, 'sunset house' and 'hammock house', all of which are built with salvaged wood from de-constructed homes in Los Angeles.

Img. 25: Hammock House



Img. 26: Axonometric Small Case Study House

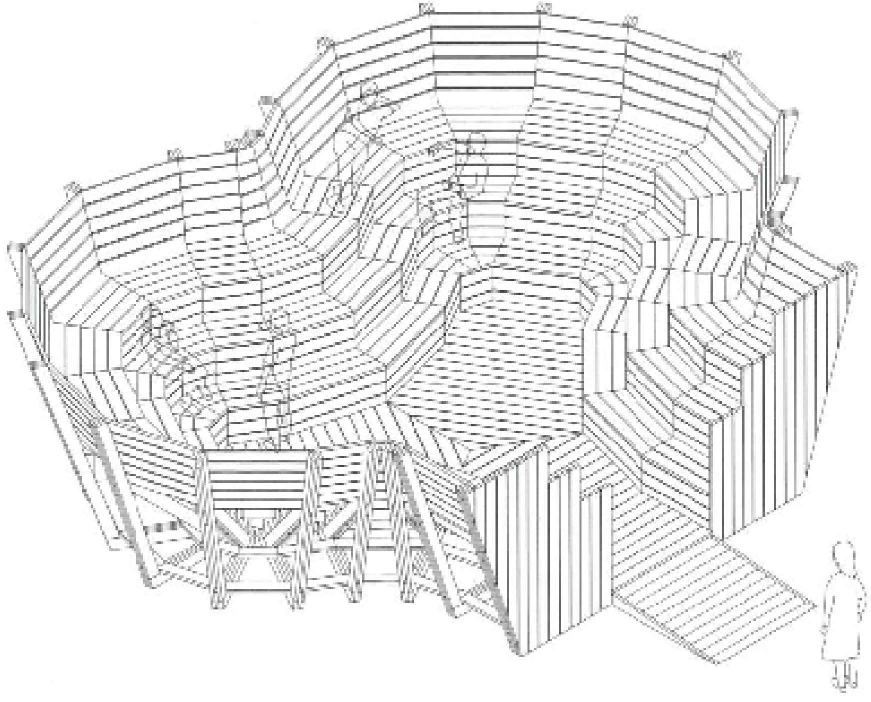


Img. 27: Vertical section perspective

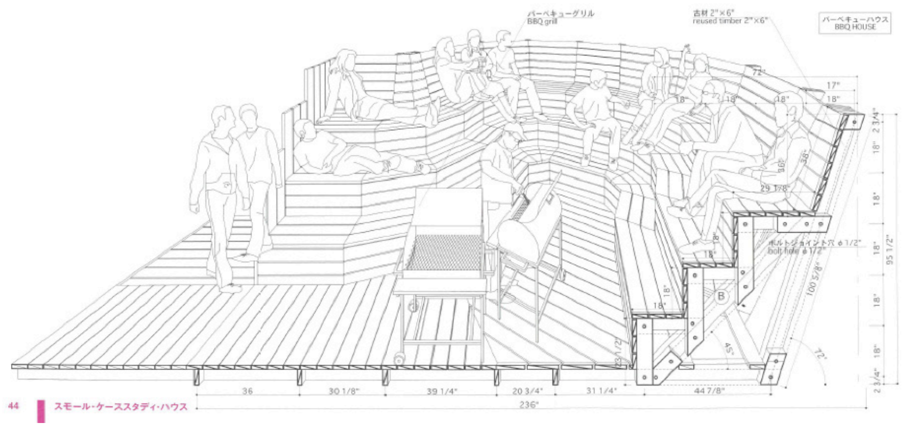
ATELIER BOW-WOW
BBQ HOUSE LOS ANGELES 2009

A group of works exhibited in Los Angeles, USA. Based on the idea of creating a single small house with a single "awareness," the works were inspired by the scenes of "hammocks," "barbecues," and "sunsets" that can be seen in the residential areas of Los Angeles on a daily basis. These works are made of 2×6 lumber and its old wood, which are used in American houses.

Img. 28: Hammock House



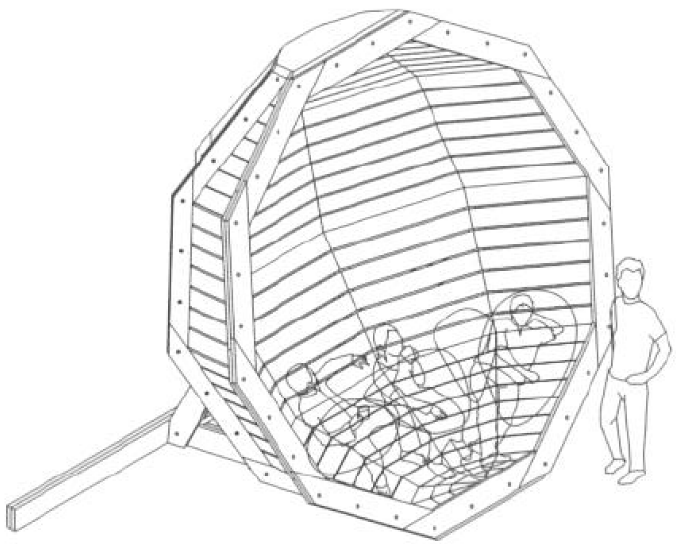
Img. 29: Hammock House



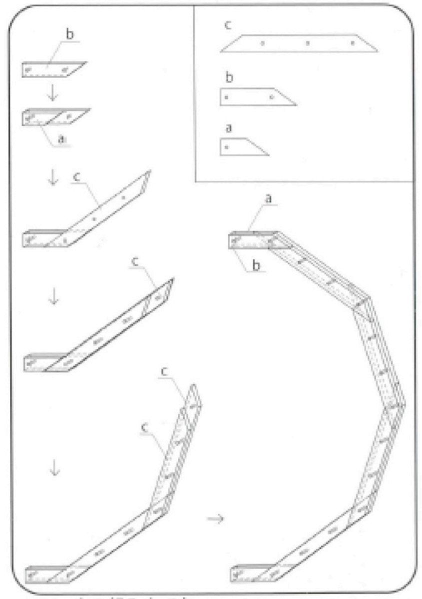
Img. 30: Vertical section perspective

ATELIER BOW-WOW
SUNSET HOUSE LOS ANGELES 2009

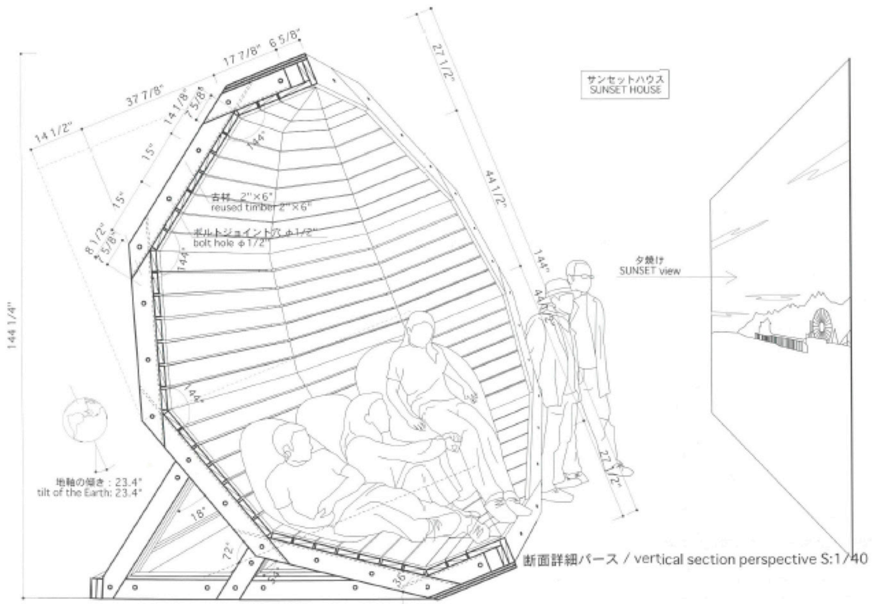
Img. 31: Sunset House (Atelier Bow-Wow)



Img. 32: Axonometric



Img. 33: Assembly instructions for SUNSET HOUSE unit



Img. 34: Vertical section perspective, scale 1:40

PUBLIC SPACE BEHAVIOROLOGY IN SWITZERLAND
STUDIO MOMOYO KAIJIMA

Public spaces fulfill an important role in our civic and urban life. They are places of spontaneous gatherings, demonstrations, markets but also offer spaces for everyday mundane activities such as eating lunch, having a drink, learning how to ride a bike and many more. How well the public spaces of a city or neighborhood work has a big influence on life quality for most of the nearby residence.

But what makes a space a good public space?

To answer this question, the 2nd year students began the semester by using the technique of Public Drawing, to analyze and understand a public space in the Oerlikon/ Seebach area.

Enriched by these observations, they have now turn to public spaces in our neighborhood and worked on enhancing them. By designing a temporary furniture, they invite people to appreciate and rethink these public spaces in their own neighborhood.

1. Sound of Meditation

Markuskirche
Höhenring 56
8052 Zürich

Fehnle Kornelia, Keller Iris, Le Mintier de L. Anaëlle, Li Yufei, Melber Antonia, Mujanovic Esad, Puthenpurackal Deepthi, Tempini Alessandro

Composed of a bird bath and a pathway, the project is a meditation space enriched by the sound of water and the chirping of birds placed above a biodiversity zone. The meditative pathway leads to a platform with a seating opportunity. Rising above the ground, the installation has a minimal impact on the ground and plants present at the site. As a transparently glazed timber construction the installation is complementing the natural flair and forms a coherent appearance on site.

2. Triangle Chairs

Markuskirche
Höhenring 56
8052 Zürich

Bennet Alexander, Bleichenbacher Dimitri, Connolly Abigail, Knellwolf Fabian, Lurati Arianna, Sandi Gino, von Albertini Gion

Facing Markus church's northern entrance, three prototype chairs offer multiple sitting postures. Introverted or extroverted arrangements let the visitor experience different relationships with the public space. The chairs are a product of continuous improvement by design iteration, both in planning and construction. Which one do you find most comfortable?

3. IntiMate

Querbeete
Koschenrütistrasse 5
8052 Zürich

Badrutt Laura Luz, Frei Benjamin, Frey Anna-Lena, Hausmann Marie, Hug Flavia, Peters Laurenz, Sonderegger Finia, Tschopp Eva

Right next to a participatory agricultural field and the Buhnstrasse bus stop, IntiMate provides different levels of privacy and thereby allow visitors to experience the exposed location differently. The structure is made of a bamboo frame and textile walls and roofs. The roofs can be pulled down and used for seating. Additionally, Bamboo mats allow invite you to sit on the floor. Knots hold the Bamboo rods together, allowing for easy assembling and dismantling of the structure.

4. The NetWork

Stadtgeiss
Felsenrainstrasse 67
8052 Zürich

Lakshmy Aparna, Müller David, Papadopoulos Sofia, Springfeld Joel, Tanner Lucas, Weinke Florian

A series of benches, combining seating and playing bring people together in a fun way. The benches are placed in a public playground and are offer something for all ages. The benches double as game, where juggling balls have to be thrown into holes. "Targets" are integrated into the backrest. How many points can you score? Play against yourself or others and keep track of your points by using the point counters integrated within the installation.

7. Fliegesthul

Spielplatz 195
Friesstrasse 17
8050 Zürich

Hatt Albert, Heimgartner Yannis, Heini Andri, Isenegger Carolyn, Kaiser David, Kauz Lukas, Spada Pietro, Wechsler Anina

Placed on a centrally located playground in Oerlikon station, surounded by a busy public transport hub, the installation put in ralation the fragmented elements of the playground and connecting them. Adjustable hammocks, suspended from cables within a wooden frame, allow people to sit and rest. A roof provides shade and protection from the rain. Lowered, the roof forms a visual barrier and allow people to sit sheltered in a cocoon and find tranquility.

6. Klappbar

ETH ONA
Neunbrunnenstrasse 50
8050 Zürich

Ampilogova Alina, Cangemi Alessandro, Cruz Lopez Monique, Dirler Constantin, Gregorio Leandro, Ritschl Lucy, Schürmann Fidania, Stäheli Nicolas

This installation is a foldable, mobile bar. The bar consists of two wings each with its own foldable tabletops. Amongst the amenities of the KlappBar are the integrated cooling box, a retractable sunroof and foldable stools. It serves as an attractive gathering point and exchange spot during events or after work. Initialy at the entrance of ONA, its flexible dimensions, adaptability and movability allows it to be set up anywhere else and offer refreshments or relaxations.

7. Snake Bench

ETH ONA
Neunbrunnenstrasse 50
8050 Zürich

Essig Anna Maria, Furrer Timothy, Hahn-Woernle Anna, Häni José, Martinez-Avial Moira, Moser Nora, Peyer Michelle, Pfeffer Jonas

Eight mobile modules: four long benches, three stools and one table, form a flexible seating opportunity that encourage different forms of gathering. The arrangement of seating and the height of the table is adjustable according to users' needs. Benches are illuminated from the inside, attracting users in ONA's corner entrance even at night. Inspired by sailing ships, the project is made of wooden frames, sailing fabric and ropes to create a weatherproof, durable, light and harmonic furniture.

8. Green Line

ETH ONA
Neunbrunnenstrasse 50
8050 Zürich

Bellarosa Lorenzo, Dietz Leandro, Howald Valentina, Soldati Kim, Summermatter Timea, Ulbrich Simon, Wyer Nadjeschda, Zwyssig Timon

Located on the south side of the ONA building at the sidewalk this herb garden invites you to spice up your food, to brew fresh tea or to simply upgrade a glass of water. A roof provides the right amount of water and sun to the plants, while also providing shade for the users. Foldable, lightweight chairs can be used to sit around the table. The height-adjustable table, surrounding the planter can be lowered and used as a bench for additional seating.

Img. 35: Student projects

Img. 36: Public space behaviorology

Img. 37: Public space behaviorology

FUTURE LEARNING SPACES

The interdisciplinary project "Future Learning Spaces" examines the interaction between physical learning spaces and the university students that use those spaces. It is a collaborative project of the Chair of Architectural Behaviorology and Cognitive Science (D-GESS). The project focus is on informal learning spaces across various learning settings. Research questions to be addressed include: What are the characteristics of informal learning spaces and what is good about them? How can the design of learning spaces facilitate active, social, and experiential learning?

In an experimental activation workshop transition spaces were transformed into creative learning spaces in a 1:1 collective design production. An interdisciplinary group of students from ETH conceptualize, design and produce 1:1 installations, in a collaborative process, using resources at their disposal like left over materials of gta Exhibitions' storage room, green, sound, air and light, keeping the budget for such transformation very low, and supporting an open process of transformation.

Img. 39: "Funnels of Knowledge", by Aude Sahli & Maxime Évéquoz

Img. 38: Workshop in the Foyer of the gta Exhibitions' spaces, HIL Building, in September 2019

Img. 40: "Future Learning Spaces", Ideation workshop, HIL foyer spaces, Sep 2019

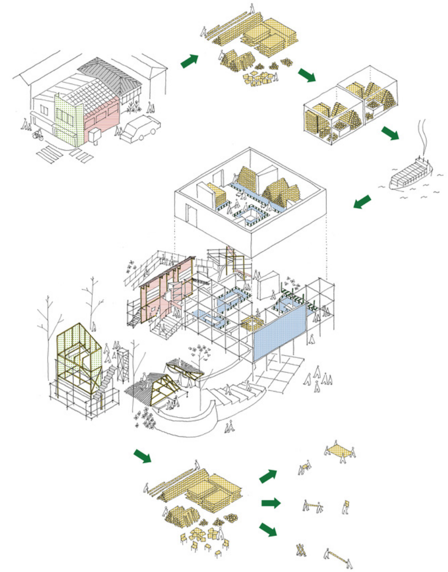
JAPAN PAVILION VENICE BIENNALE 2021
KOZO KODOWAKI

Titled Co-ownership of Action: Trajectories of Elements, the project curated by Kozo Kadowaki involves dismantling an old wooden Japanese house and transporting it to Venice to be reconstructed in a new configuration with the addition of modern materials. The exhibition exemplifies how old materials could be given an entirely new existence by putting the current movement of goods in the service of reuse rather than consumption.

The Japanese contribution to the 17th Architecture Biennale highlights how the ability to quickly and inexpensively move goods around the world has exacerbated mass consumption. Shifting the focus from movement in the service of mass consumption to movement for the purpose of reconstruction and reuse, the curatorial project consists of moving an ordinary postwar Japanese house to Venice, giving it a new existence in a different context. The house is one of the many in Japan that have outlived their usefulness and await demolition due to the country's declining population. The deconstruction of the house unearthed several strata of renovations and expansions, with elements ranging from handmade to mass-produced, which trace a fragment of Japan's construction industry. These layers show how the current project is just one in a series of rewritings in the house's history. Employing the skills and ideas of local and Japanese artisans, the dismantled elements of the house have been re-purposed into objects that furnish the Japan Pavilion's garden, while unused parts will be on display inside the Pavilion. After the exhibition, the house will take on a new trajectory, as there are plans for it to be used as part of a community facility for residents of an apartment complex in the outskirts of Oslo.

Img. 41: Japanese House before dismantling (Image © Jan Vranovský)

Img. 42: Co-ownership of Action: Trajectories of Elements (Image © Alberto Strada)

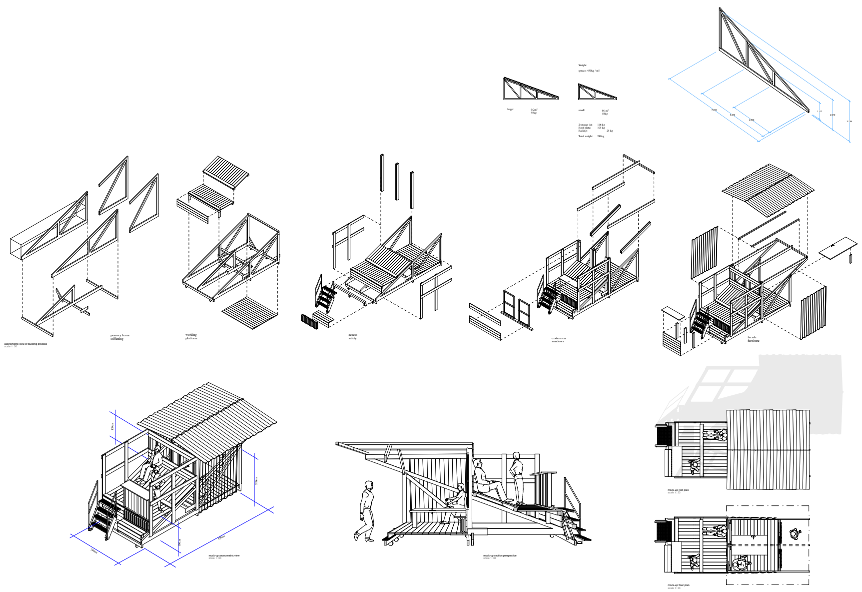


Img. 43: axonometric. (Image © DDAA + village®)

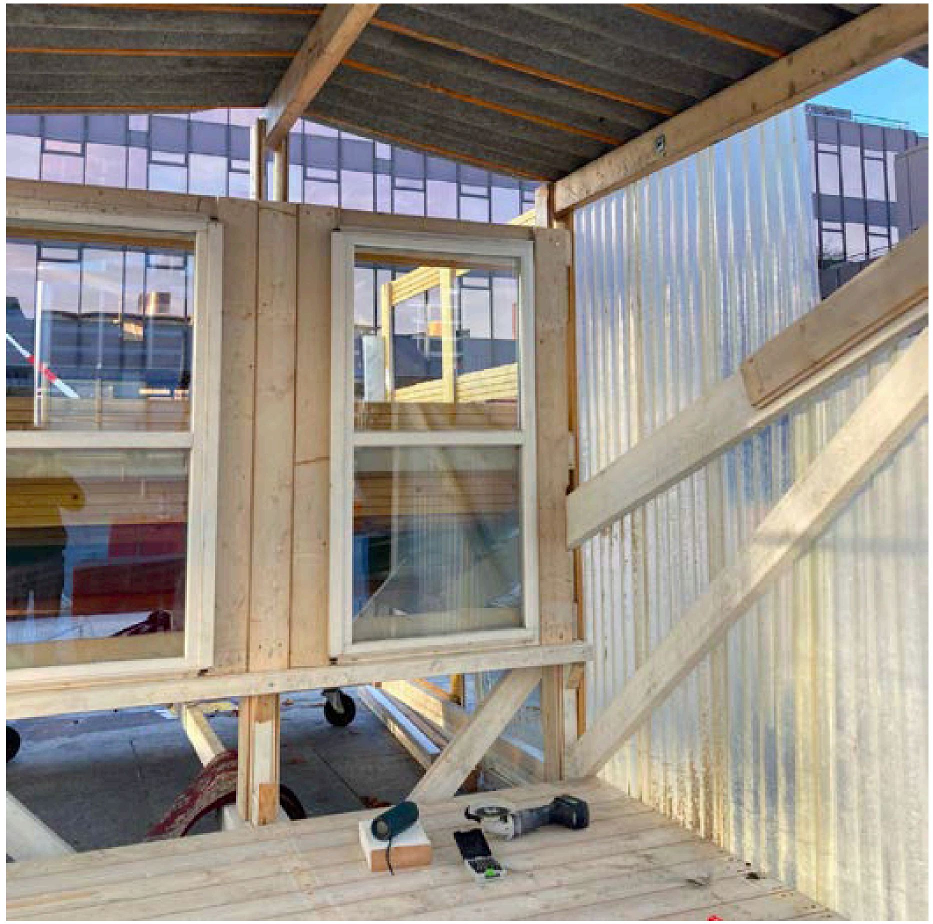
RE-USE MOCK-UP
ELIAS KNECHT

A 1:1 mock-up was built with real components of the Huber pavilions in order to test the different construction methods and joints. It can be dismantled by students to improve further construction. Materials come together in an ad-hoc manner of construction. Designing and testing go in parallel loops. Many options only become visible when testing the a 1:1 situation and revising the plan. The character of the re-use pavilion hereby reflects the experimental use and hands-on experience of an endless laboratory of learning space. A culture of sustainability in construction can be achieved through positive learning experiences during education regarding circular building systems.

First and foremost, during construction, the protection of health and safety of all protagonists and future users is of most importance. Aside from respecting all building norms (SUVA) and rules for the protection of workers (EKAS), a safety concept is required. This includes an assessment of dangers and risks on the construction site, rules of conduct, principles and organisation of safety instructions and action planning. A healthy culture of safety is fostered with leadership by example and audit of experts and responsible safety officers.

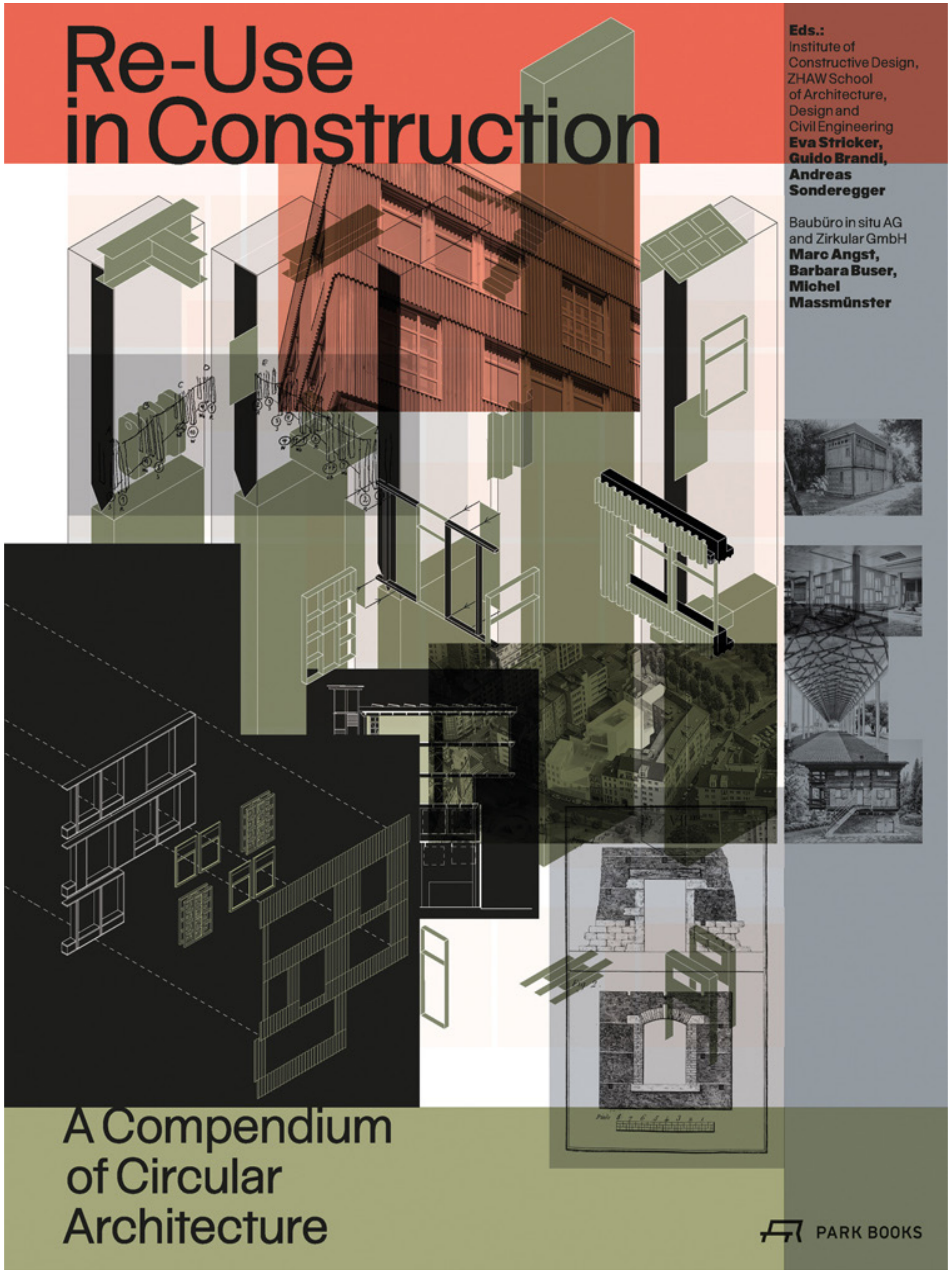


Img. 44: 1:1 Mock Up with re-use material from the Huber Pavilions (Elias Knecht)



Img. 45: Mock-Up interior

BAUTEILE WIEDERVERWENDEN (2021)



Img. 46: Re-Use in Construction (2021) A compendium for circular architecture

Img. 47: Bauteile Wiederverwenden (2021) Ein Kompendium zum zirkulären Bauen

CARPENTRY
The activity or occupation of making or repairing things in wood. The work made or done by a carpenter

SOFTWOOD
A tree belonging to the order Coniferales. Softwood trees are usually evergreen, bear cones and have needles or scale like leaves. Examples include pines, spruces, firs and cedars. See conifer.

HARDWOOD
Trees with broad, flat leaves as opposed to coniferous or needled trees. Wood hardness varies among the hardwood species, and some are actually softer than some softwoods.

BEAM
A horizontal structural member which supports a load.

POST / PILLAR
A vertical structural member which supports a load.

JOINT
Place were two or more pieces of wood are connected.

TRUSS
A framework, typically consisting of rafters, posts, and struts, supporting a roof or other structure.

STRUT
A rod or bar forming part of a framework and designed to resist compression

RIDGE
The line or edge formed where the two sloping sides of a roof meet at the top.

RAFTER
Structural member of the roof, spanning from the ridge to the purlins

PURLIN
Structural member of the roof, parallel to the ridge

EAVE
Lower part of a roof which projects over the wall.

SPAN
Distance between the structural supports in floors, ceilings, and roofs.

LIFE CYCLE ASSESMENT

REDUCE

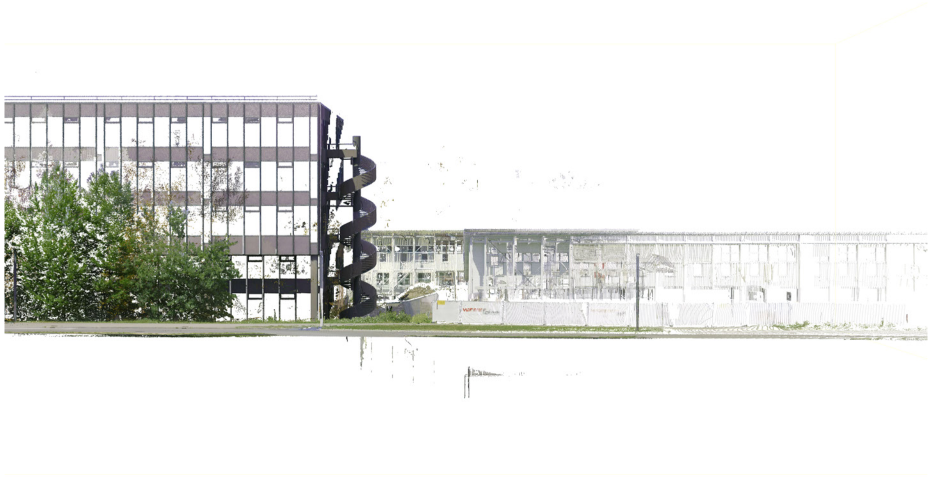
REUSE

RECYCLE

Pavilion Re-Use

	Material	Origin	Amount	Dimensions	Weight
Primary Structure:					
Truss	Timber	Roof structure	15	270 x 780cm	
Truss-Beam	Timber	Roof structure		15 / 18 x 5,5cm	
Timber < 3m	Timber	Collonade between pavilions	40	11,5 x 11,5 cm	
Timber > 3m	Timber	Beams, Coloumns	15	24 x 14 cm	
Boards, Larch	Timber	Exterior veranda	50	120 x 12 cm	
Boards, Timber	Timber	Roofplates	500	240 cm	
Beams	Timber	Roofplates	30	800 x 7 x 7cm	
Secondary Structure:					
Window sash, large	Wood, Glass		14	80 x 155cm	
Window sash, small	Wood, Glass		21	80 x 100 cm	
Window with frame	Wood, Glass			170 x 176 cm	
Door, interior	Wood, Aluminum		6	84 x 198 cm	
Door, exterior	Wood, Aluminum		5	108 x 205 cm	
Glass, VSG	Glass	Interioir balustrades	2	100 x 200 cm	
Grid bracing	Metal	Roof bracing	1	60 x 200 cm	
Grid balustrade	Metal	Interior balustrades	1	90 x 200 cm	
Eternit panels	Eternit	Roof cladding	200	90 x 250 / 170 cm	
Corrugated roof, small	Plastic		4	495 x 50 cm	
Corrugated roof, large	Plastic		3	495 x 110 cm	
Tertiary Structure:					
Stairs, large	Metal		1	500 x 105 cm	
Stairs, small	Metal		1	90 x 140 x 70 cm	
Radiators	Metal		20	350 x 50 x 7 cm	
Water basin	Porcelain		1		
Clothes hook	Metal		1		
Curtains	Textile		1		
Boiler					
Toilet	Porcelain		2		
Urinal	Porcelain		2		
Fluerescent lamp	Glass				
Spotlight	Glass, metal				
Cable tunnel	Plastic		30		
Motion detector	Plastic				
Pipe	PVC, plastic		3	12 x 200 cm	
Door handle, locker	Metal		1		
Mirror	Glass		2	40 x 50cm	
Exterior:					
Paving stone	Bakestone		450	12 x 24 cm	
Cement plates	Cement		40	40 x 60 cm	
Step	Cement		3	40 x 60 cm	
Rock	Stone		1	120 x100 x50 cm	

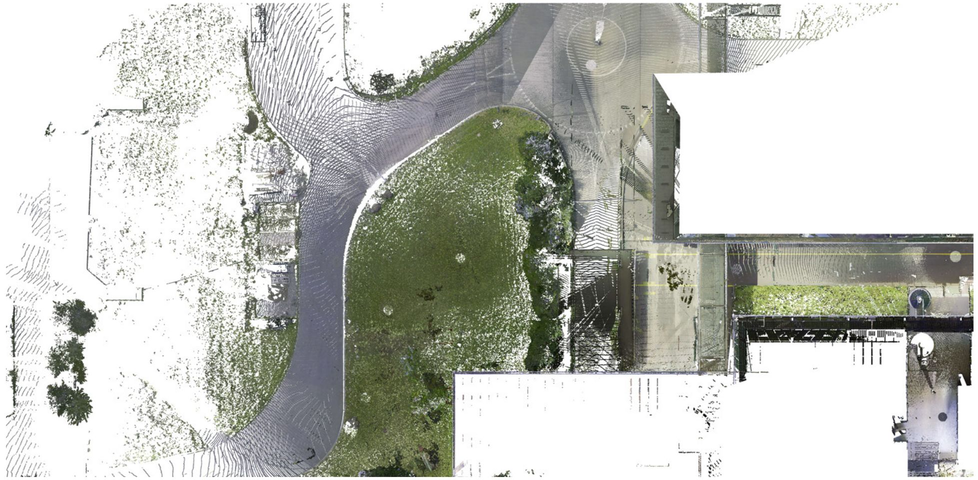
Img. 48: Material inventory sheet, Chair of Architectural Behaviorology



Img. 49: Scan of Huber Pavilions

Img. 50: Perspective scan of construction site

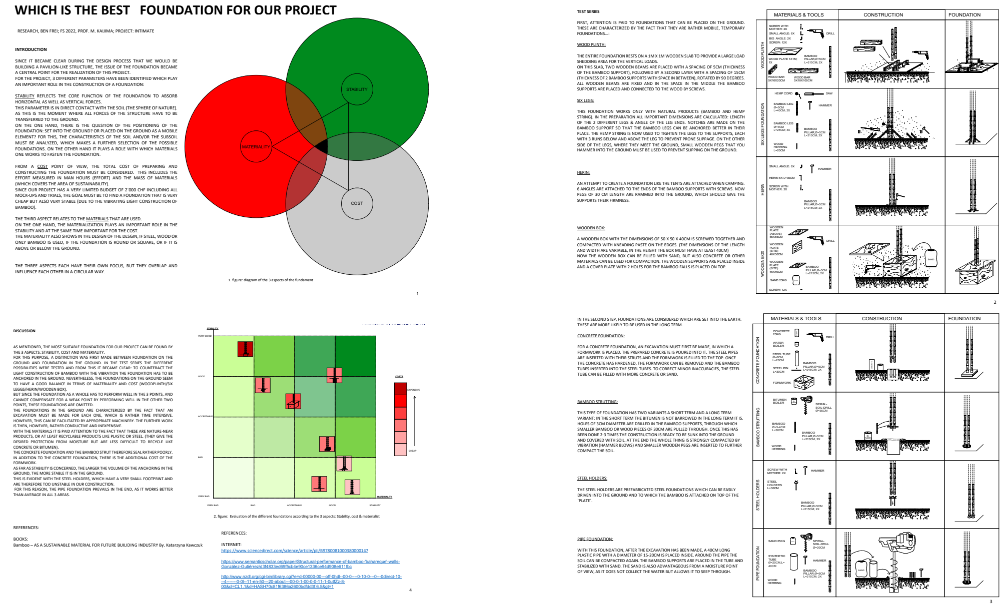
APPENDIX



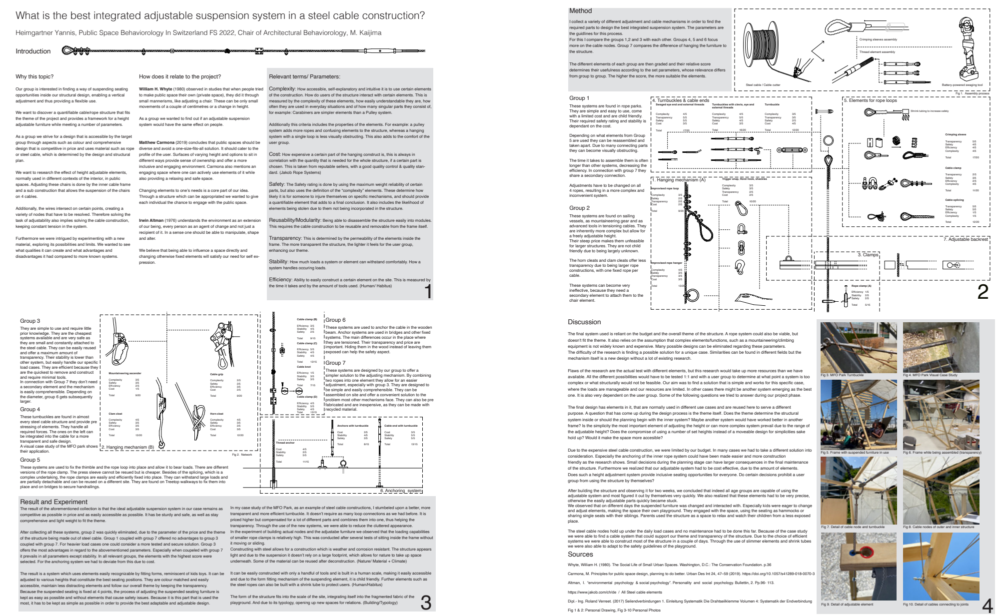
Img. 51: Scan of Construction site

Img. 52: Perspective scan of construction site

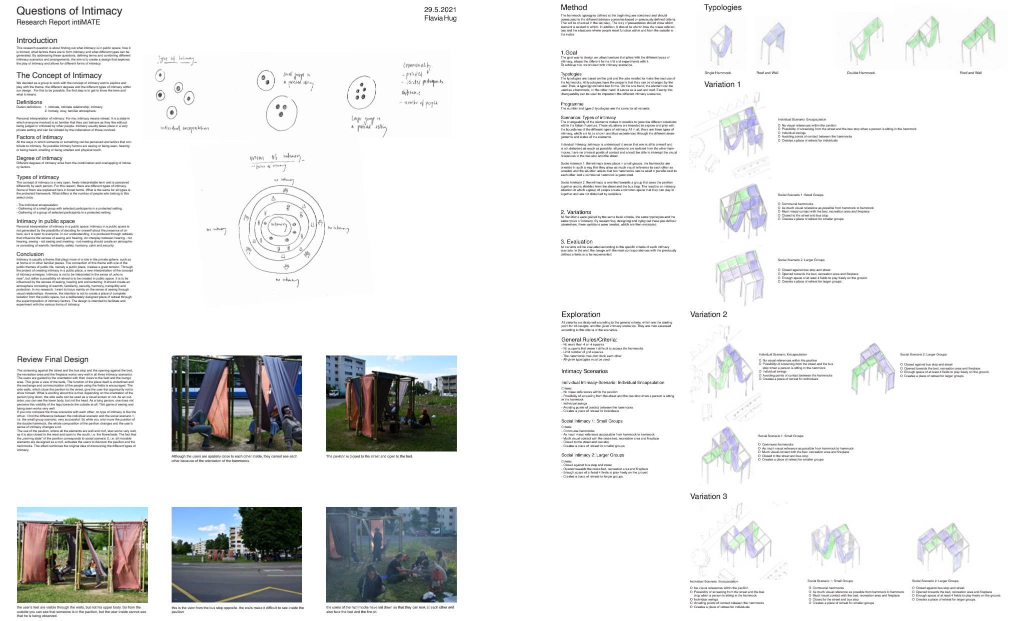
APPENDIX



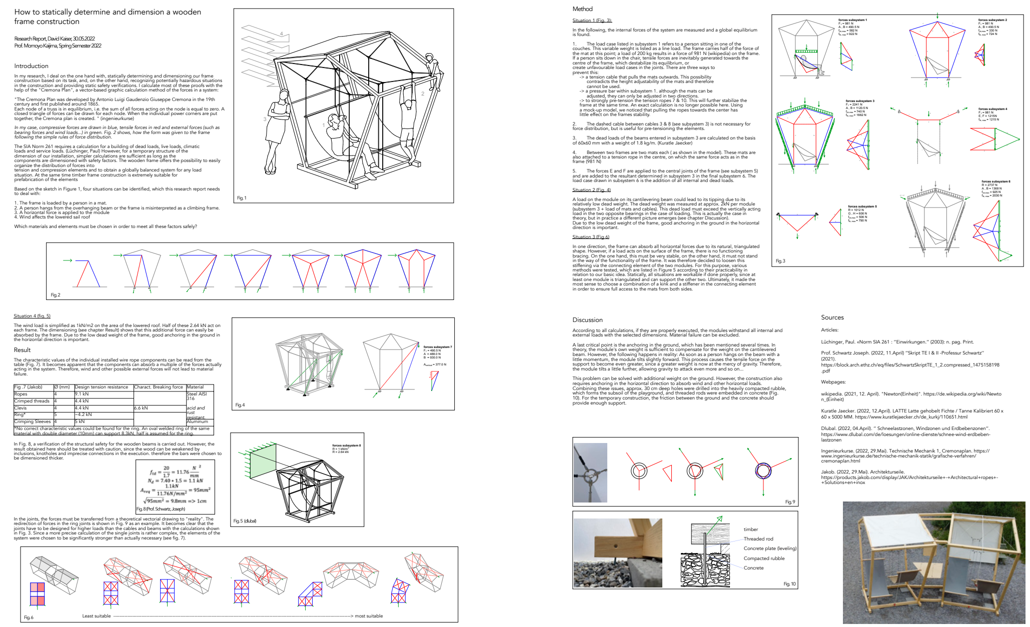
Img. 53: Research Report by Ben Frei, 22FS, Final Review



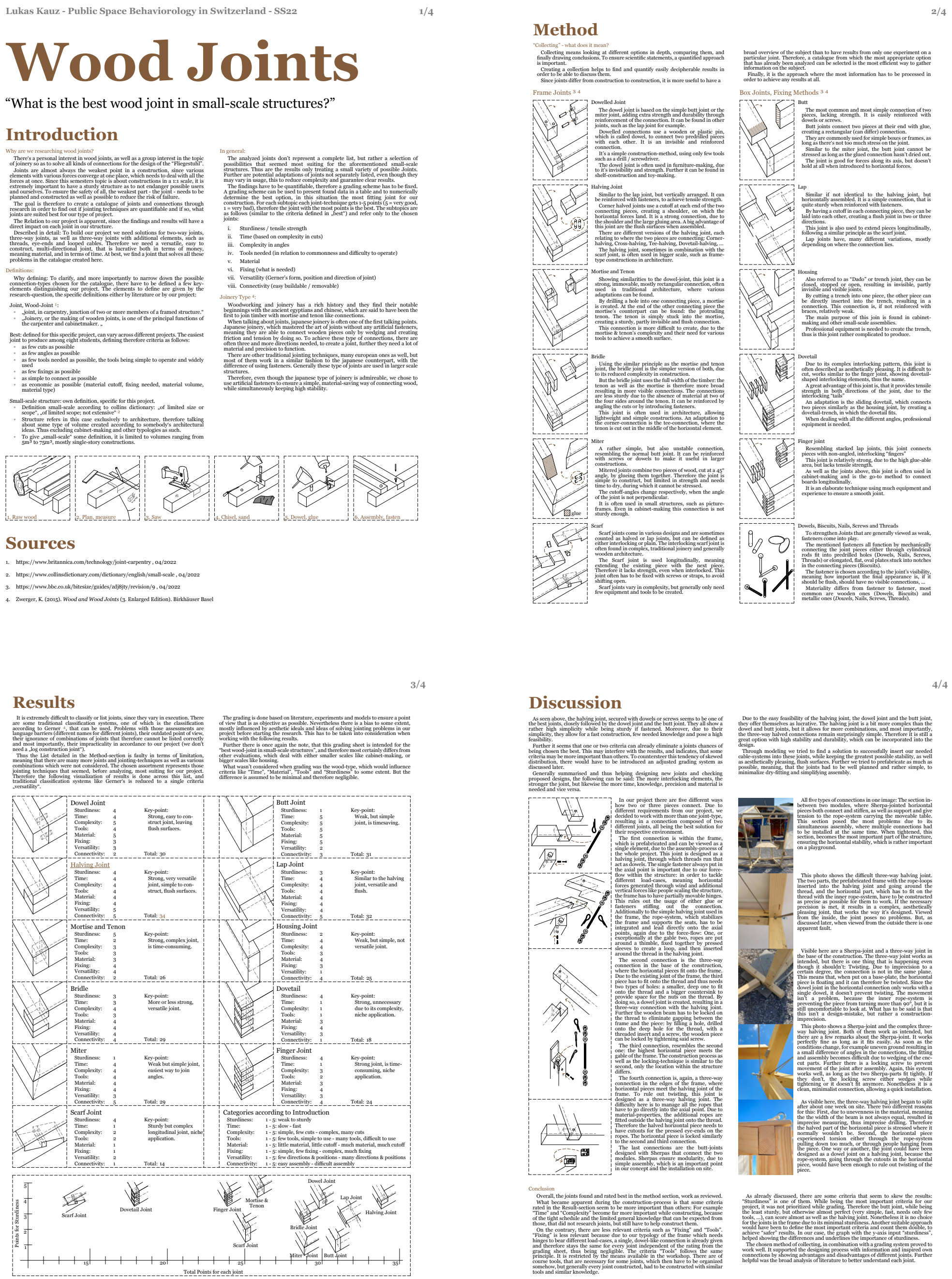
Img. 54: Research Report by Yannis Heimgartner, 22FS, Final Review



Img. 55: Research Report by Flavia Hug, 22FS, Final Review

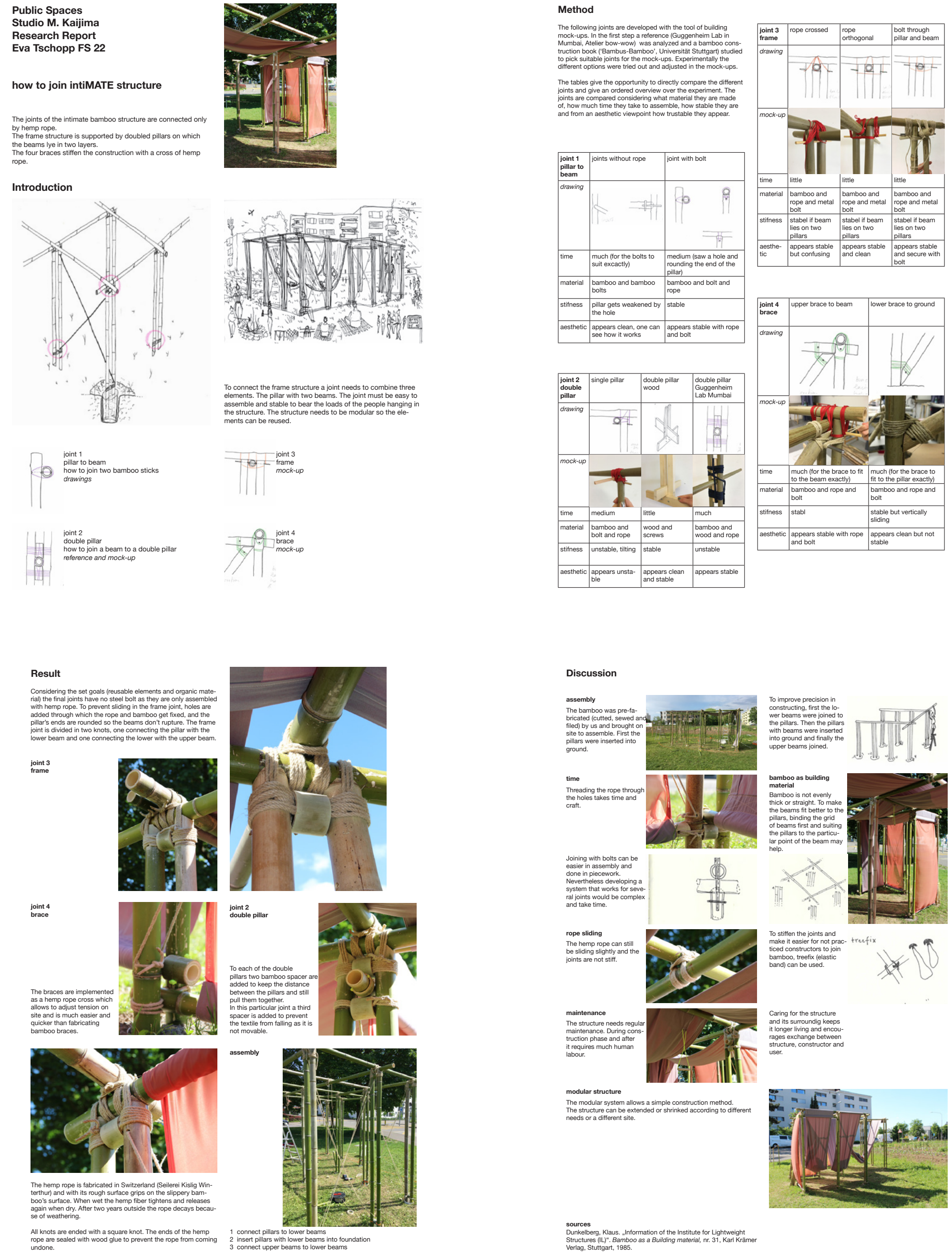


Img. 56: Research Report by David Kaiser, 22FS, Final Review



Img. 57: Research Report by Lukas Kauz, 22FS, Final Review

APPENDIX



Img. 58: Research Report by Eva Tschopp, 22FS, Final Review

SOURCES - TEXT & Image

Img. 1: Future Learning Spaces, Elias Knecht, 2023

Img. 2: ETH Hönggerberg, 1st construction phase, ETH Bibliothek, Comet Photo AG

Img. 3: ETH Hönggerberg, 3rd construction phase, ETHZ, Alessandro Della Bella

Img. 4-12: Future Learning Spaces, Elias Knecht, 2023

Img. 13: ETH Image archive, https://ba.e-pics.ethz.ch/catalog/ETHBIB.Bildarchiv/r/1019/viewmode=infoview/qs-r=Ans_00955

Img. 14-16 & TEXT:: Kopfhalle 118, Baubüro insitu ag, https://www.insitu.ch/projekte/196-k118-kopfbau-halle-118 ,

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Img. 19-21 & TEXT: Re-Use Pavilion Campo, 2022, https://openhouse-zuerich.org/orte/re-use-pavilion-campo/

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Img. 25-34 & TEXT: Atelier Bow-Wow, "Graphic anatomy 2", Tokyo : TOTO Publishing, 2014, pp.44-45

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Img. 42: https://venezia-biennale-japan.jpf.go.jp/e/participants/kozo-kadowaki

Img. 44-45 & TEXT: https://works.arch.ethz.ch/thesis/future-learning-space

Img. 46-47: bauteile Wiederverwenden, 2021, Ein Kompendium zum zirkulären Bauen, IKE, ZHAW, Eva Stricker, Guido Brandi , Andreas Sonderegger

Img. 48: Research Object Inventory Sheet, Future learning Spaces,Elias Knecht, 2023

Img. 49-52: Point Cloud Scans of HIL Building, Chair of Digital Fabrication

Img. 52 - 58: Research Report, Final Review, Public Space Behaviorology, Chair of Architectural Behaviorology, FS23

Chair of Architectural Behaviorology

Institut für Entwurf und Architektur - ETH Zürich
Prof. Momoyo Kaijima

Assistant:
Elias Knecht

Office:
ETH Zürich
ONA G36
Neunbrunnenstrasse 50
8050 Zürich
Switzerland

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