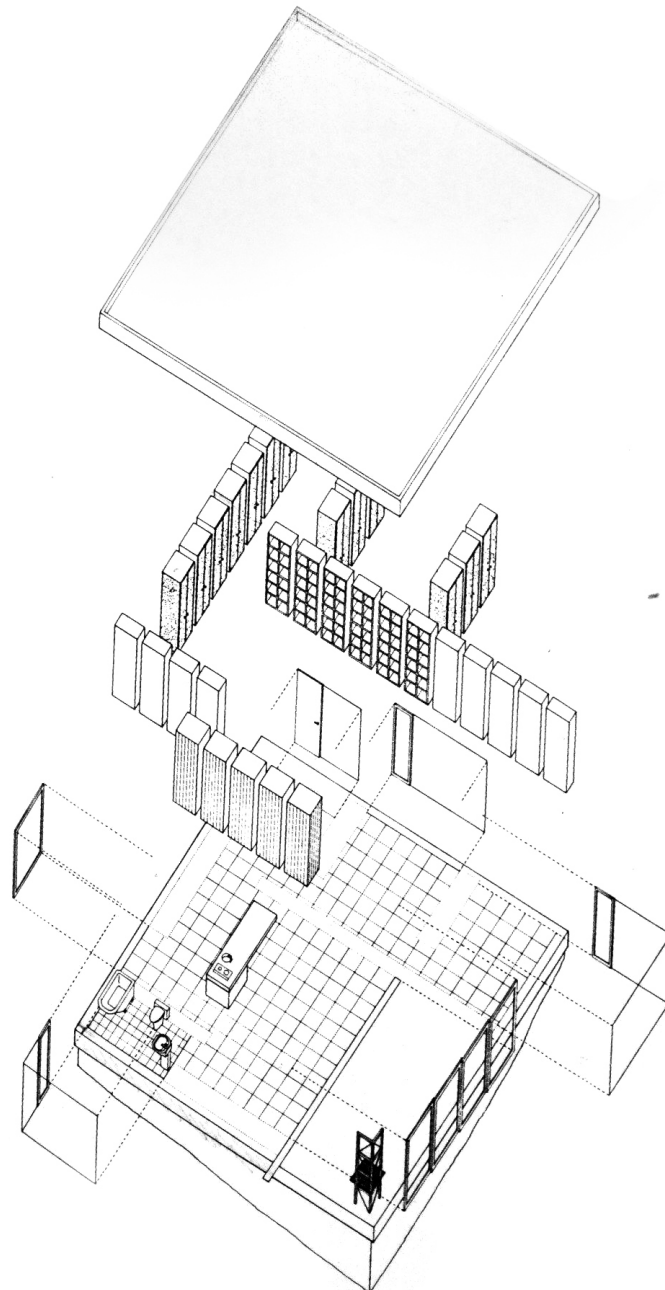


Core Programme Master Thesis HS 2021: Timber - Construction

Cooperation Partner 1: Professur Andrea Deplazes

Cooperation Partner 2: Dozentur für Bautechnologie und Konstruktion



Durability and timber construction

The task is based on a so-called C-task and concerns questions of sustainability, which are dealt with conceptually and constructively. Based on a construction method such as timber, specific properties for the formation of structure and space are investigated and translated into an architectural project.

At the same time one of the oldest building materials and construction methods, this material is experiencing new, or even continuing, relevance today from various points of view.

In addition to constructive innovations and local properties (ecological, aesthetic and building-cultural anchoring), the basic character of the joined construction method can also claim relevance from an economic perspective. The discussion about the circular economy in construction and thus the dismantlability of constructions not only harbours economic potential through the recycling of building materials, but also design qualities.

When innovations such as prefabrication in wooden elements took their first steps more than a hundred years ago, leaps in scale were developed from a traditional construction method by linking it with technology, which opened up new perspectives.

Today, systemic prefabrication of wooden elements is standard on both large and small scales. Houses are assembled from prefabricated walls, wooden furniture is used as a load-bearing and space-structuring element, or entire modules are stacked to form buildings. Similarly, more traditional construction methods made of individual components are finding favour in the corresponding environment / building task, such as knitted construction or the balloon frame.

From an ecological perspective, too, wood is the most important renewable raw material in Switzerland, with a total annual growth of around 9.7 million cubic metres. In order to replace petrochemical materials in the long term, the prudent use of wood represents a sensible alternative - also in order to secure the ecological and social services of the forest and to make them accessible to the national economy.

Based on this broad range of possibilities, we will examine which construction methods can serve as a starting point for designing sustainable or durable buildings. Whether longevity ultimately aims at reuse or durability is to be assessed from a project-specific perspective.

Preparation phase

- analysis of the construction method and its characteristics

The starting point is not a building site and therefore not a given context. Rather, a kind of „roadmap“ is given, a strategy that selects the construction method as the basis for the building site. Make an outline of the different building methods in wood and consider which spatial, constructive and ultimately also sustainability-related connections arise with the respective building method.

From this layout on, a specific structure is to be chosen and its space formation potential to be studied in plan and model. The construction method always harbours structural and thus spatial properties that influence the character of a building. The next question is how such a construction method can be integrated into the issue of sustainability.

- Development of an architectural idea

For this purpose, the diagram designed by Guillaume Haberts can be of use, in order to develop a meaningful narrative (storytelling), which functions as a derivation of the design idea. The building method and the resulting design thus embark on a search for a building site, which in turn exerts its influence on their project.

- Investigations in urban planning

From the juxtaposition of the constructive criterias with the possibilities of sustainable design processes, a context for the placement of the architectural project is now to be found and an urbanistic planning is developed.

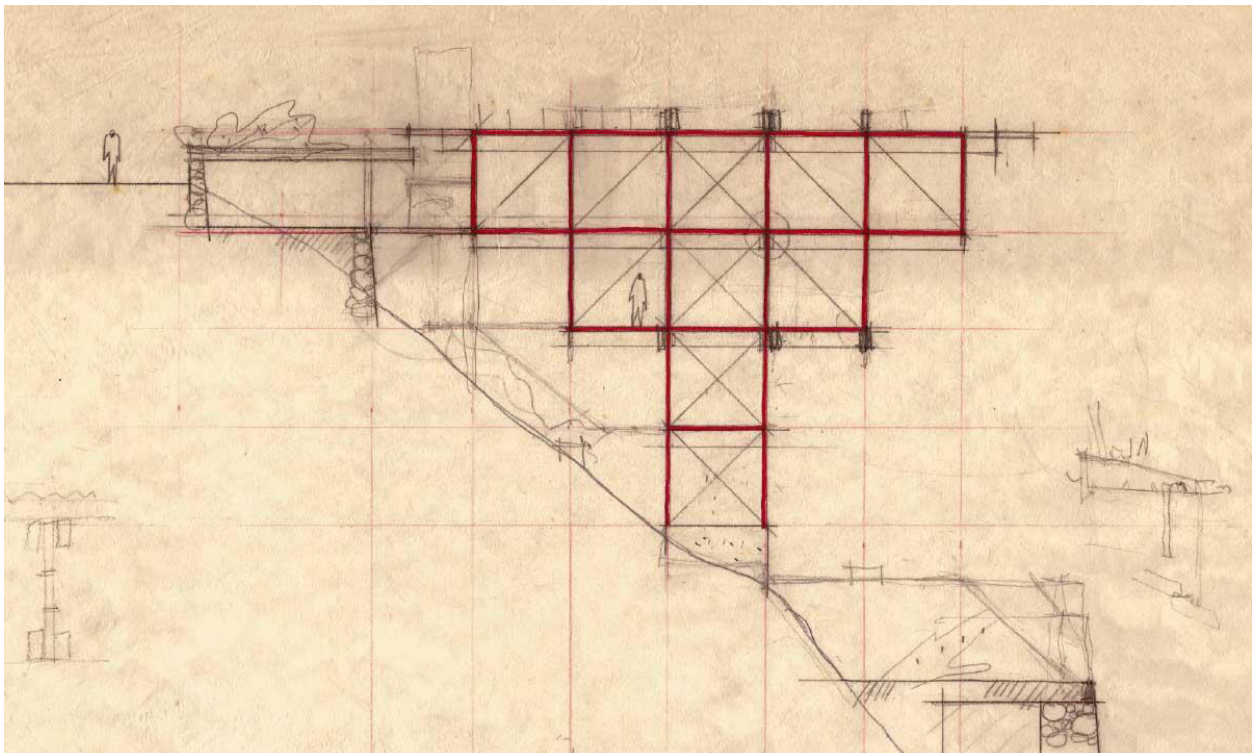
Elaboration phase

- Elaboration of an architectural project

From the symbiosis between the site and the project, your design now emerges, so that in the end the architecture and the surroundings not only adapt to each other, but also bring out the „hidden“ potential of both the site and the construction.

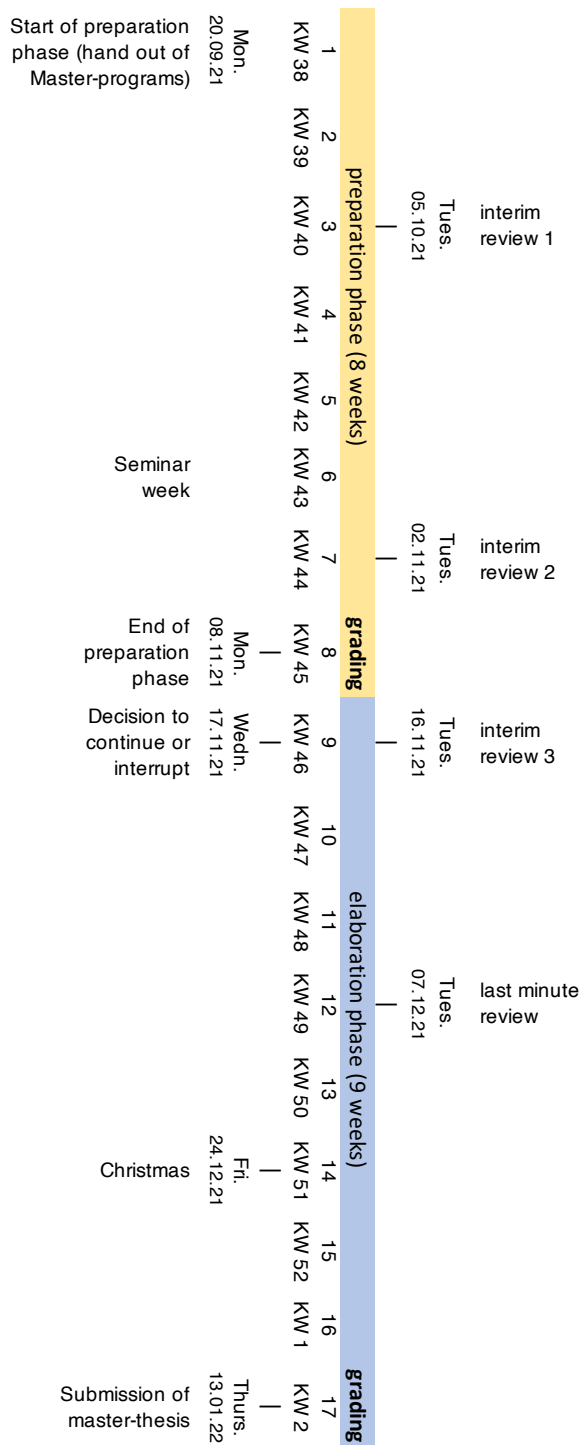
- Constructive elaboration, materialisation and architectural expression

From the interactions between construction, design idea, site and the sustainability narrative, the expression of the project refines and comes to a head.



House in Morumbi, Helio Olga & Marcos Acayaba, São Paulo, Brasil, 1987-90

Master thesis dates



- Master thesis issue

Monday, 22.02.2021, presentation of the topics

- Interim review 1

Tuesday, 05.10.2021, from 14.00

- short analysis of the issue (sketches / plans / models)

- Interim review 2

Tuesday, 02.11.2021, from 14.00

- Explanation of the project (plans / working models)
- Concept of space, load-bearing, accessibility and infrastructure
- Concept of construction and materialization
- Concept of accompanying subjects

- Interim review 3

Tuesday, 16.11.2021, from 14.00

- first layout proposal
- project plans & precise working models
- rough draft spatial representation

- Last minute review 4

Thursday, 07.12.2021, from 14.00

- clear recognition of the focal points (> final submission)
- in depth plans regarding the construction

- Final Submission

Thursday, 13.01.2022, until 18.30

- project plans & models
- spatial representation
- explanatory report
- accompanying subjects

- Digital data

At the same time as the final submission, the complete works (layout and plans as PDF files, images separately as jpg files) must be submitted to the professorship in digital form. The files can be submitted on a CD-ROM or via a data server (deplazes-server/deplazes-stud, wetransfer, dropbox, etc).

- Grading conference

Monday, 24.01.2021

Short review of the master's theses. This will be followed by the grading conference and a public inspection by the professors.

- Weighting

Design / Conception (AD)	50%
Construction / Realisation (BUK)	50%

- Interruption of work

The master thesis can only be interrupted for important reasons (illness, accident). Any interruption of work must be reported immediately to the study secretariat of the Department of Architecture (Mathias Imgrüt, imgruet@arch.ethz.ch) as well as to the professorship. A doctor's certificate must then be presented.

Information sheet

- Autodidacts

With regard to professional practice, prospective architects are required and expected in their master's thesis to approach complex issues systematically and in a structured manner as autodidacts and to be able to develop their own approaches to solutions. As in any design process, the own work and architectural idea must be sharpened again and again through new (self-)critical questioning.

- Diploma Mature

For the master's thesis, we require that the candidates have reached diploma maturity. This means that after their completed semesters of study, they have sufficient experience and sufficient working methods and techniques of their own to work on their Master's thesis independently. Thus, the master's thesis is the result of the master's students and not of the supporting assistants of the professorship.

- Reviews

The critiques are to be understood as support for the Master students in the sense of coaching. Four official interim critiques help during the master thesis to clarify the solution approaches and to sharpen design intentions in their result.

During the interim critiques, the briefly presented work is discussed by Professor Deplazes and other experts in the plenum. Thereby, the most important aspects of the project are singled out, discussed and possible solutions are discussed. Since it is not always possible to discuss all aspects of individual projects conclusively and comprehensively, the project discussions of fellow students are an indispensable supplement to the students' own critiques. The presence of all students at the interim critiques is therefore required. During the (weekly) table critiques there is the possibility to discuss the current project status with the assistant individually.

- A-B-C

With a simple A-B-C feedback, a short assessment of the current status of the work is given after the critique, regarding quality and viability of the concept and regarding implementation. The following applies: A = good, B = fair, C = weak.

- Critique log

The intermediate critiques must be recorded in a written critique protocol, which is to be given to the assistants. The students are responsible for this. The short protocol, which is always written by a colleague, must document the most important points of the critique and the relevant comments on the project in key words. At the debriefing sessions with the assistants, the critique is discussed on the basis of this protocol and ambiguities are clarified.

- Self-assessment

Sometimes the potential or the conceivable possibilities for further work on a project are also discussed during the critiques. However, only the present and presented project status is evaluated. Based on the feedback (A-B-C) after the intermediate critiques and the personal self-assessment, it is thus possible to get a concrete picture of the effective status of one's own work during the master's semester.

- External help

For the completion of the project presentation and final submission, it is expected that the work is carried out to the highest possible degree by the candidates themselves. External help is to be avoided to a large extent, and the use of paid assistance is prohibited.

- Grade and evaluation

The Master's thesis is assessed with a grade according to the study regulations. In this grade, the assessments of the two accompanying subjects (insofar as they are relevant to the design), the work process during the Master's semester and the final submission as a whole are taken into account to an appropriate extent. The grade will be communicated to the degree candidates via my-studies after the grading conference. In addition to the grade, candidates will receive a short written assessment text on their design work and the accompanying subjects at a later date.

Design / Conception

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Professur Andrea Deplazes
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Prof. Andrea Deplazes deplazes@arch.ethz.ch
Andrea Waeger waeger@arch.ethz.ch

Construction / Realisation

Bautechnologie und Konstruktion / BUK
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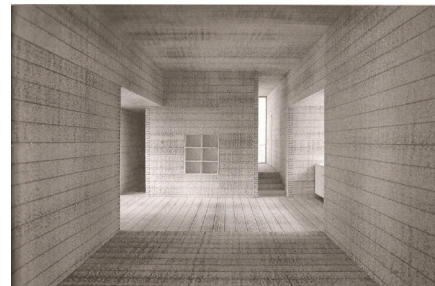
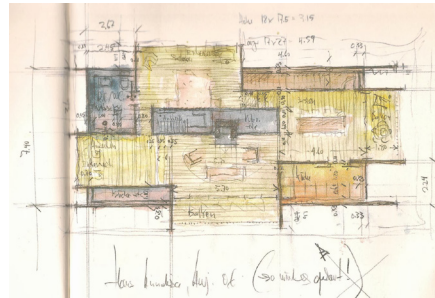
Daniel Mettler mettler@arch.ethz.ch
Daniel Studer studer@arch.ethz.ch

Strategies in timberconstruction

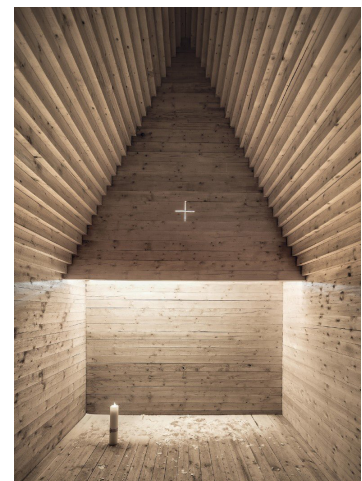
The following list represents one way of looking for an assembling method and consequently for a possible space-building strategy. It's not aiming the construction method, which is another matter.

Massive

Assembling individual components (of only one layer) like beams for example in order to build walls and floors



Peter Zumthor
Strickhäuser, Leis (CH), 2004



Hannes Sampl
Bergkapelle, Lasaberg / Kendlbruck (AT), 2017

Kartonage

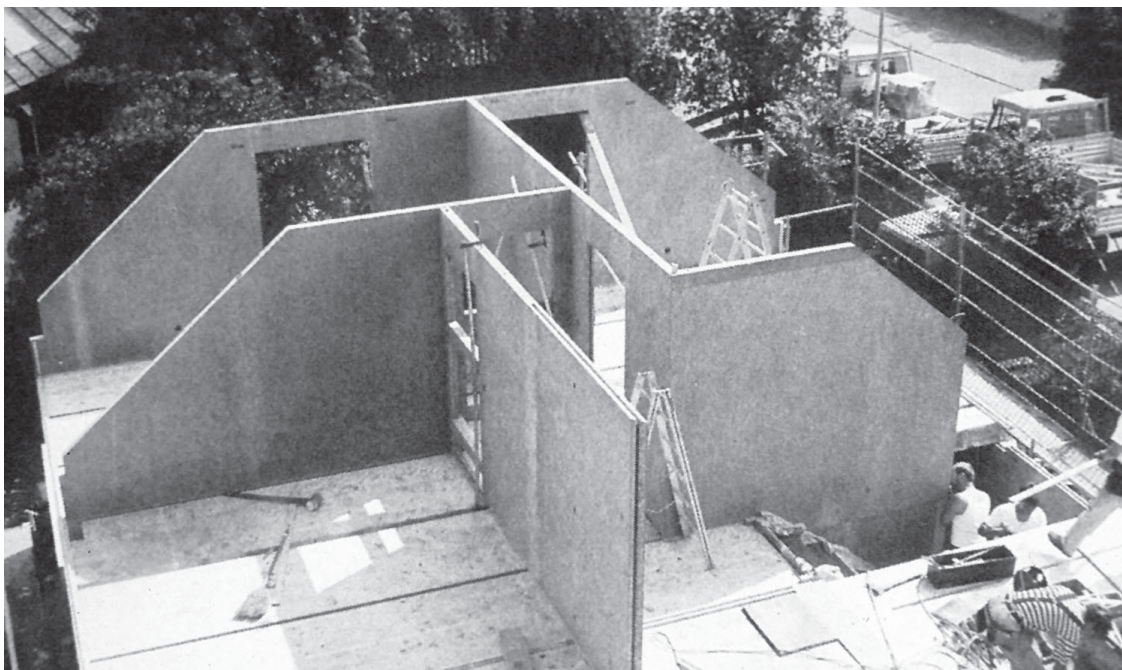
Assembling prefabricated walls and floors of different layers



Bearth & Deplazes,
Haus Bearth-Candinas, Sumvitg (CH) 1998



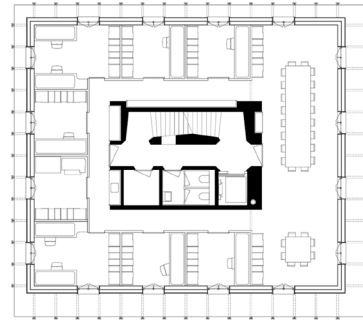
Bearth & Deplazes,
Haus Willimann, Sevgein (CH) 1998



panel construction
(source unknown)

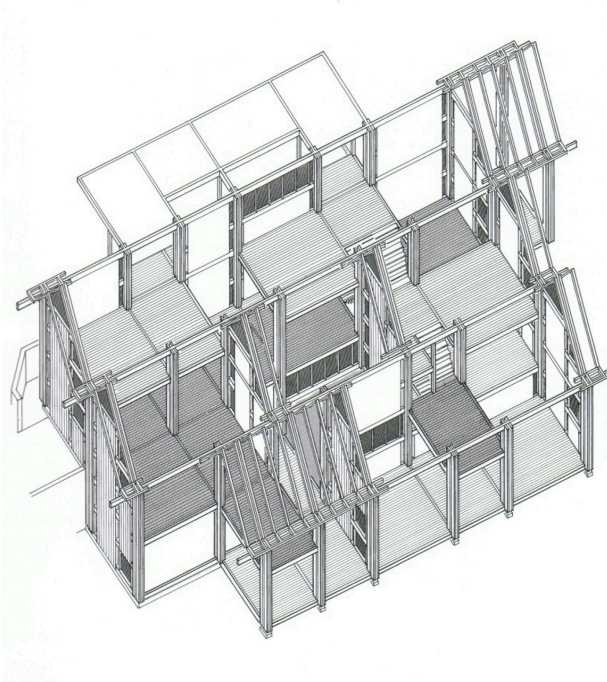


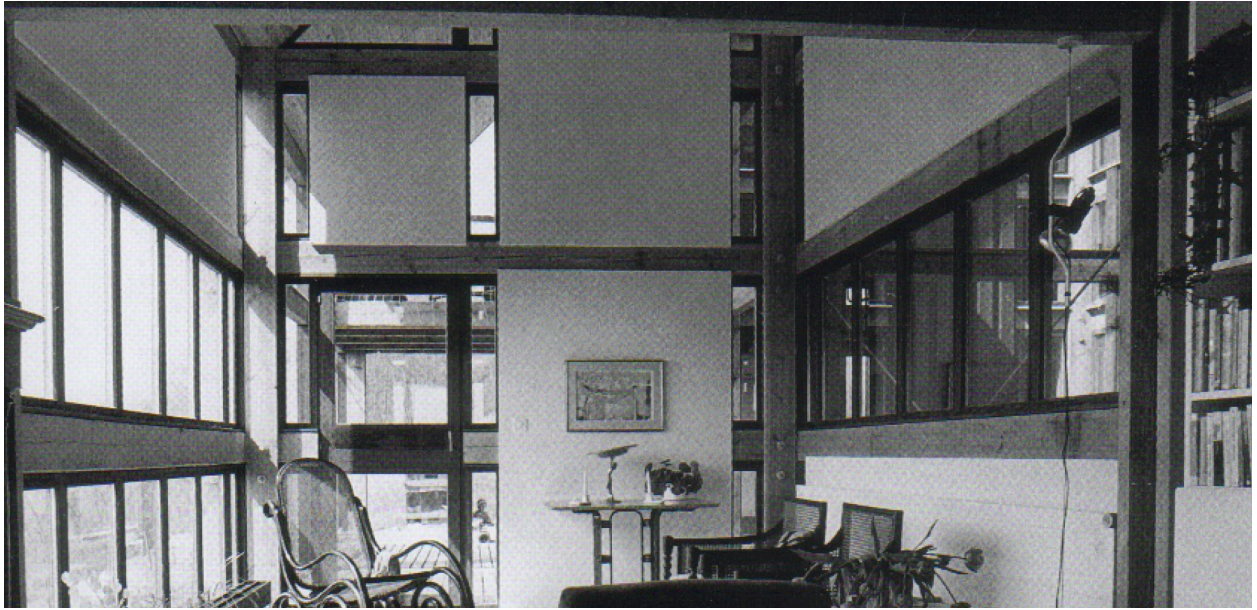
Seiler Linhart
Bürohaus Küng, Alpnach (CH), 2020



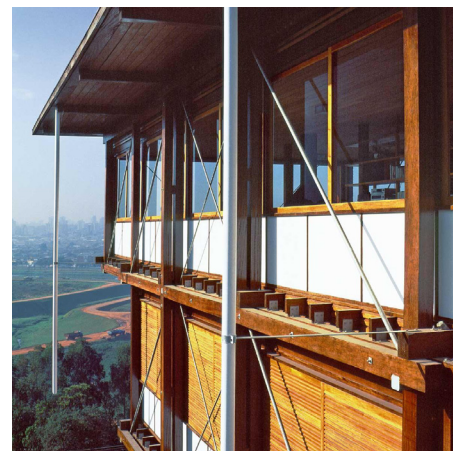
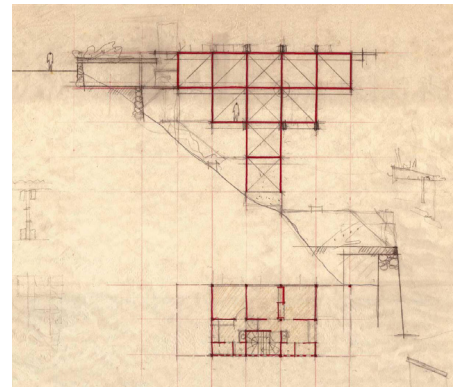
Framing

Construction of a grid as base for further room-defining steps such as fill-ins or skeleton for plankings



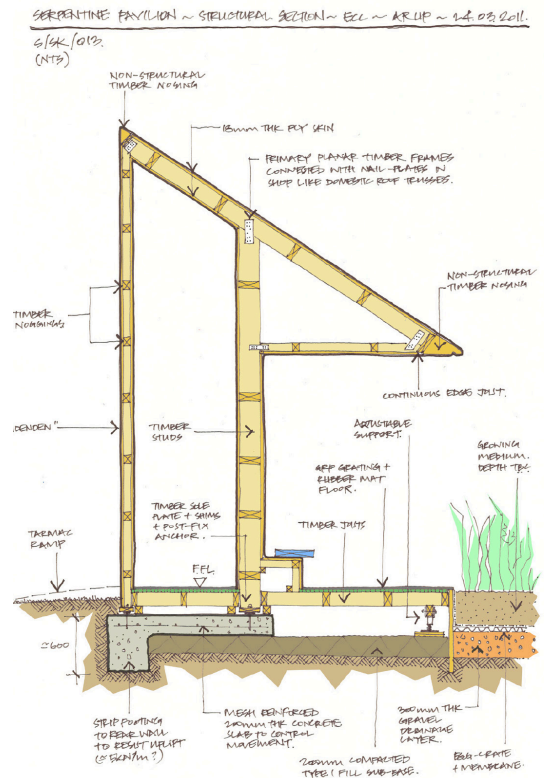


Heer Architektur
Einfamilienhaus Heer, Lostorf (CH), 1979



Helio Olga & Marcos Acayaba
House in Morumbi, São Paulo (BR), 1990

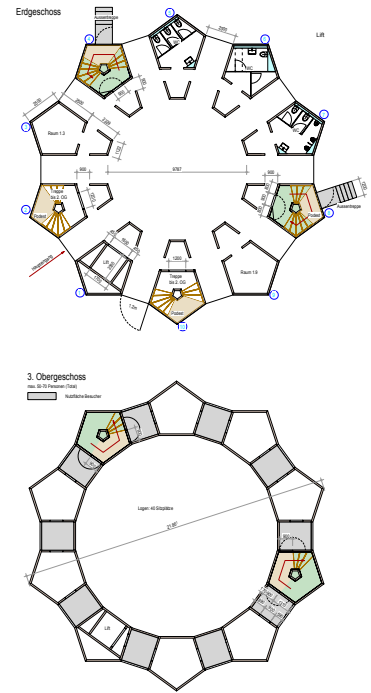




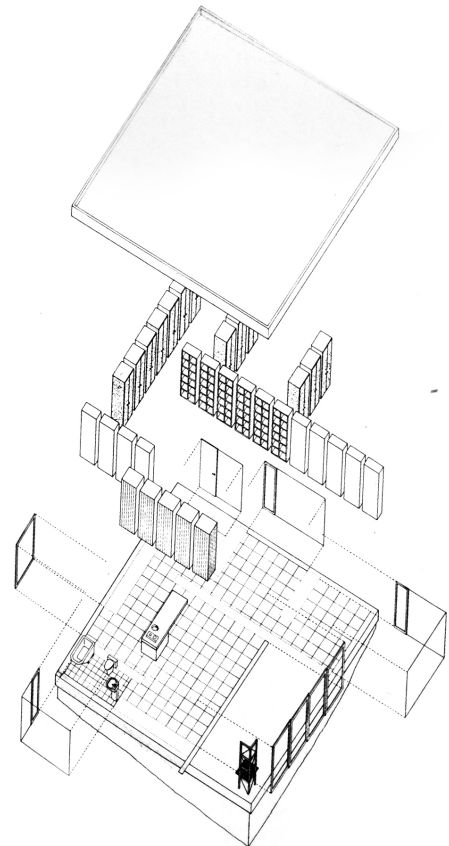
Peter Zumthor
 Serpentine Pavilion, London (UK), 2011

Modular

Building up prefabricated units like room-boxes or static-furniture where the elements are already assembled



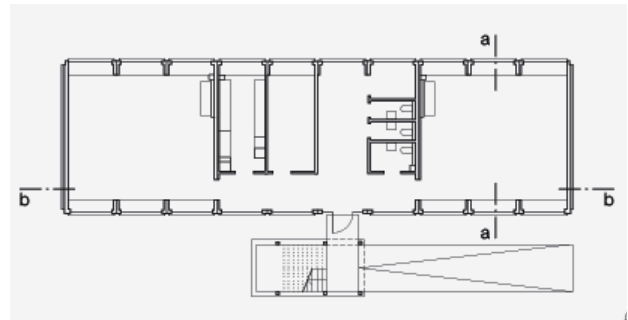
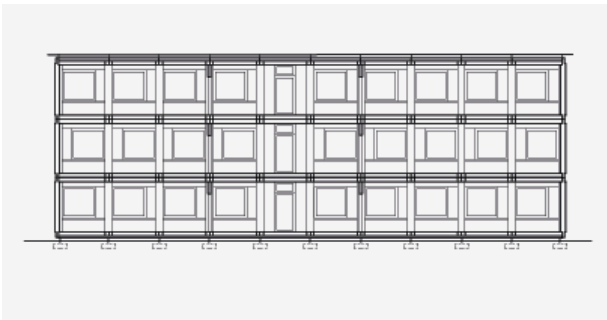
Origen tower (Juliertheater), Julierpass / Silvaplana (CH), 2017



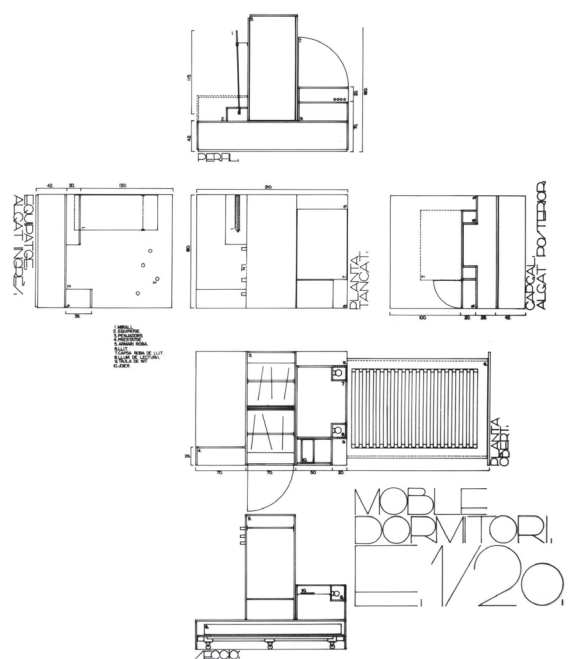


Shigeru Ban
Furniture House 1, Yamanashi (JP), 1995





Bauart Architekten und Planer AG
 (Holzbauunternehmen: Blumer-Lehmann AG)
 Modulare Schulen in Zürich (CH)
 1. Generation 1998 – 2012
 2. Generation seit 2012





Flores & Prats
Casa en una maleta, Barcelona (SP), 1997