

b a l a n c i n g a c t

Agenda

- Introduction
- Interdisciplinarity in education
- Project „balancing act“
- Project „Neue Vahr 2035“

Summary and outlook

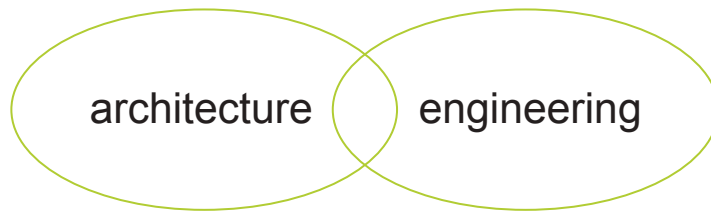
Introduction



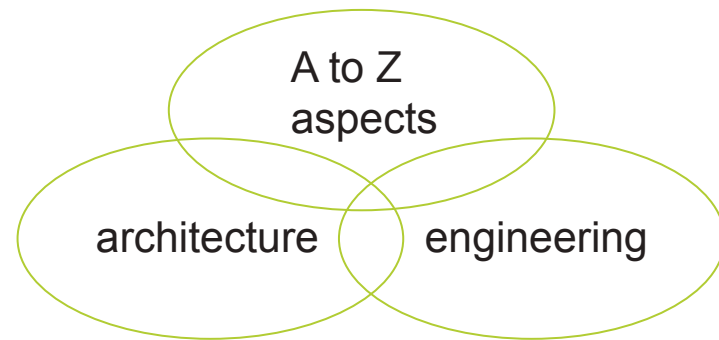
disciplinary



multidisciplinary



interdisciplinary



transdisciplinary

Introduction

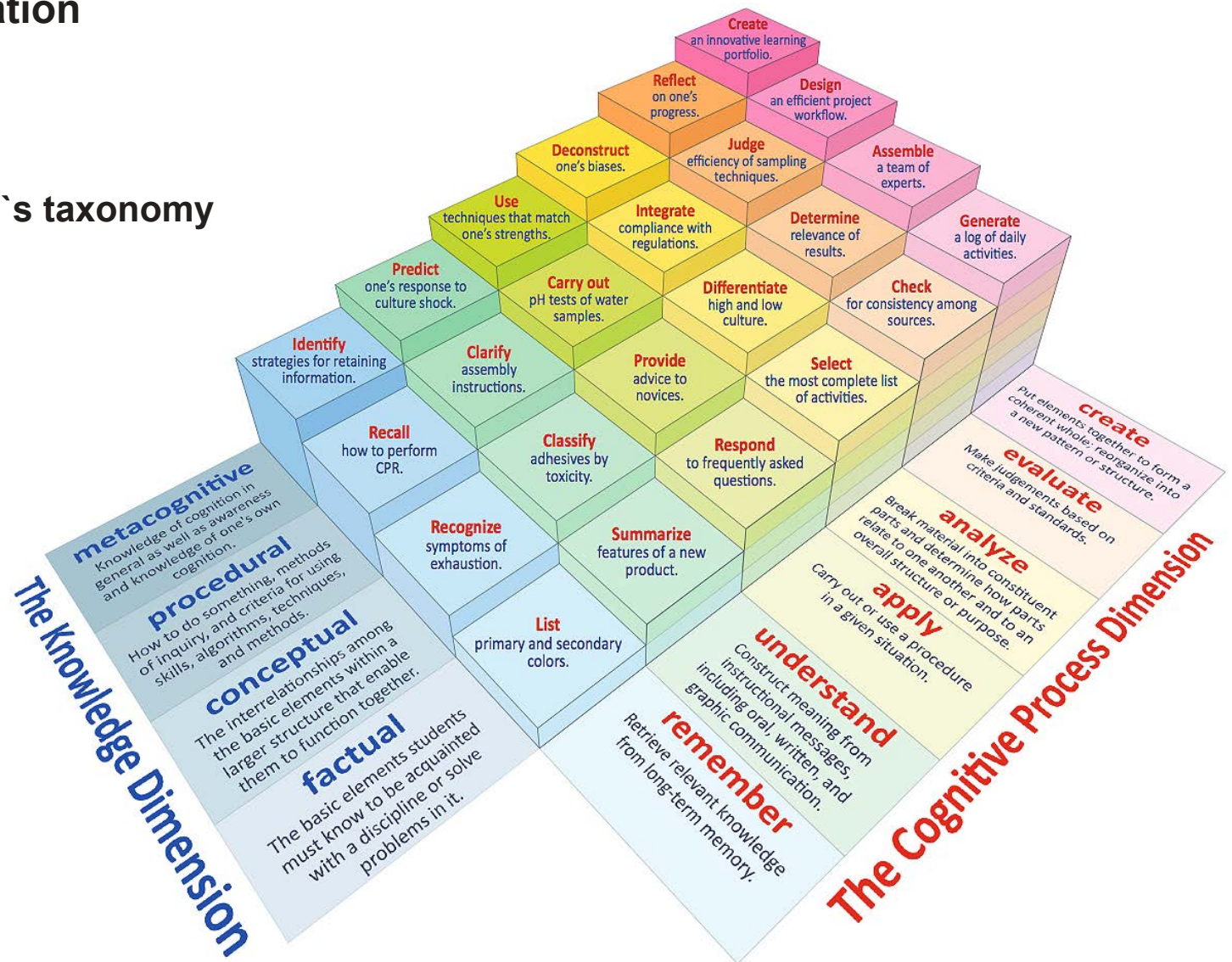
multidisciplinary: “[...] research that incorporates more than a single discipline, with each individual discipline independent from the other. Participants remain in the traditional teams and structures [...]”

interdisciplinary: “[...] close cooperation with very strong integrating aspects, whereby the individual work areas of the disciplines are represented with in the group [...]”

Höttlä-Otto et al. (2015): Teaching Interdisciplinary Design between Architecture and Engineering: Finding common Ground While Retaining Disciplinary Expertise, Proceedings of the ASME 2015, Boston, MA, USA

Interdisciplinarity in education

Bloom`s taxonomy



Interdisciplinarity in education

Architecture

- initial years include topics such as fine arts, history, mathematical and structural engineering courses (latter once quite similar to civil engineering)
- opportunity to synthesize these topics in design courses and studios
- architecture studio course persist throughout an architecture student's education and takes up about from 6-16 hours per week of in-class time
- architectural studies are dominated by the problem-based learning (PBL)
- Architecture students pedagogy begins from the “highest point of cognitive level” of Bloom's taxonomy

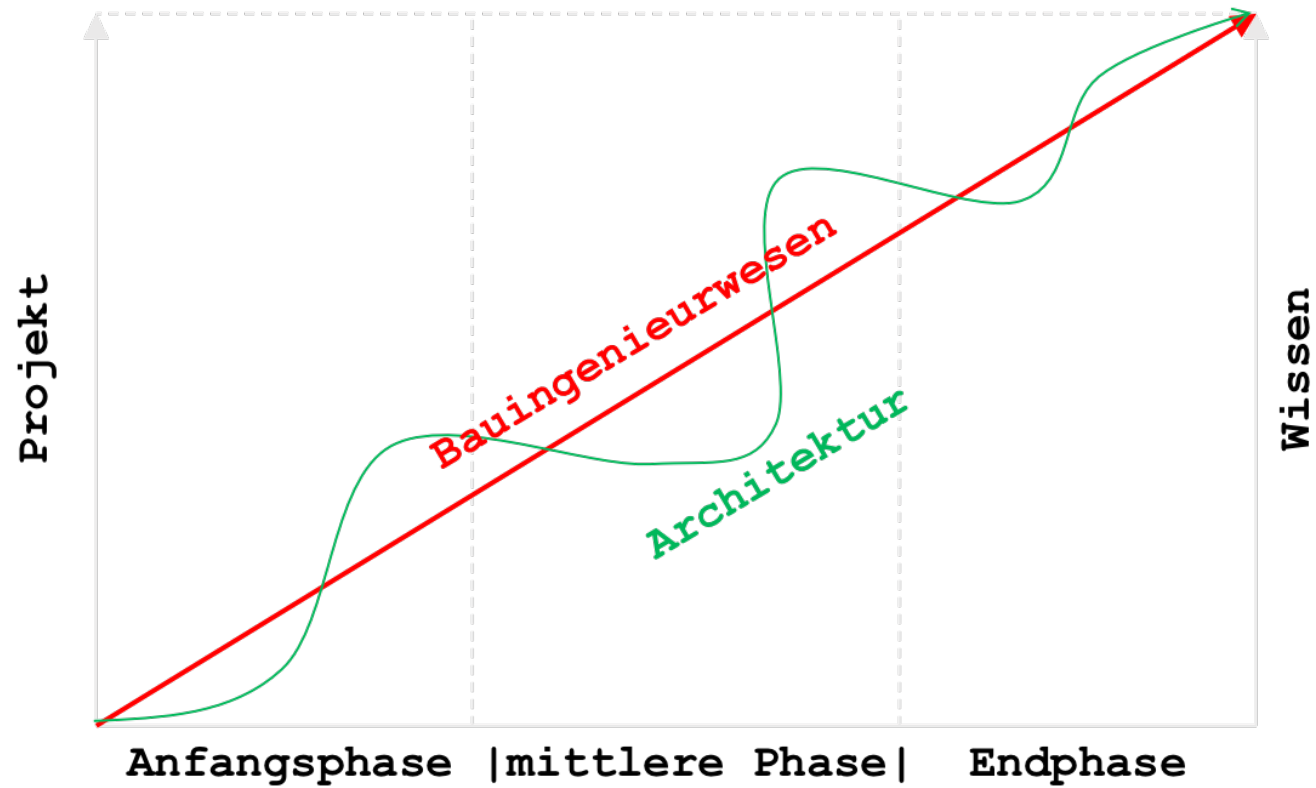
Interdisciplinarity in education

Engineering

- curriculum is organized into the instruction of basic sciences and mathematics during the first two years followed by two years focused on engineering sciences
- this educational approach lends itself to an approach biased towards intuitive, verbal, reflective and sequential learners.
- Topic information is communicated to students through presentation and lectures in a deductive manner, where principle are taught first, followed by its application
- Approach is made for deeply analytically and technically competent engineers
- Engineering students pedagogy starts “at the lowest levels” of Bloom’s taxonomy

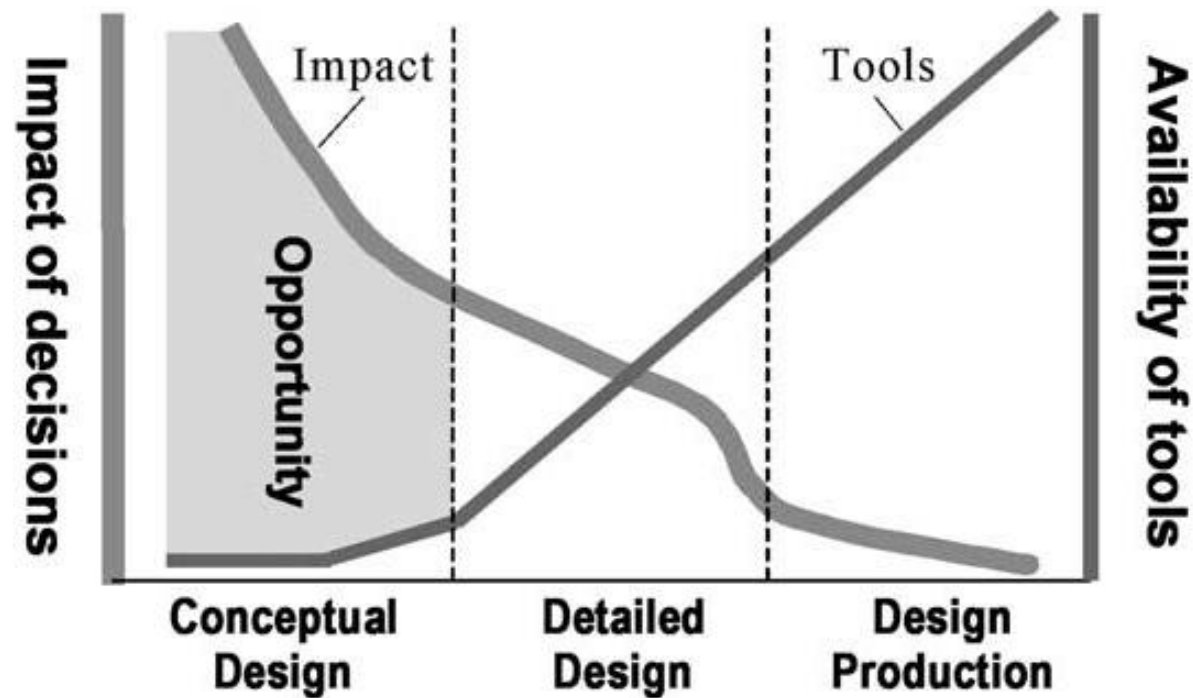
Interdisciplinarity in education

Learning curve / learning phases engineering vs. architecture



Interdisciplinarity in education

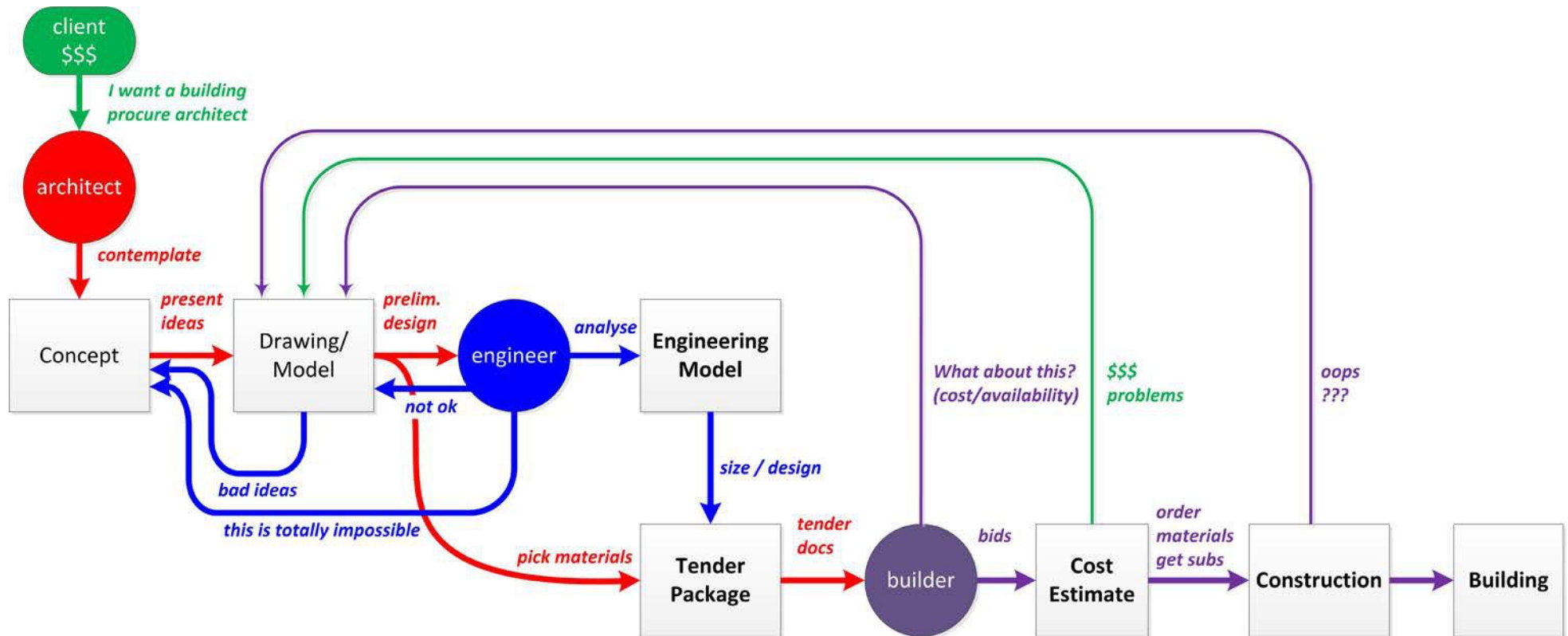
Opportunities vs. possibilities



Kovacik et al. (2014): Interdisciplinary Design: Influence of Team Structure on Project Success, Procedia Social and Behaviour Sciences, Proceedings of the 27th IPMA World Congress

Interdisciplinarity in education

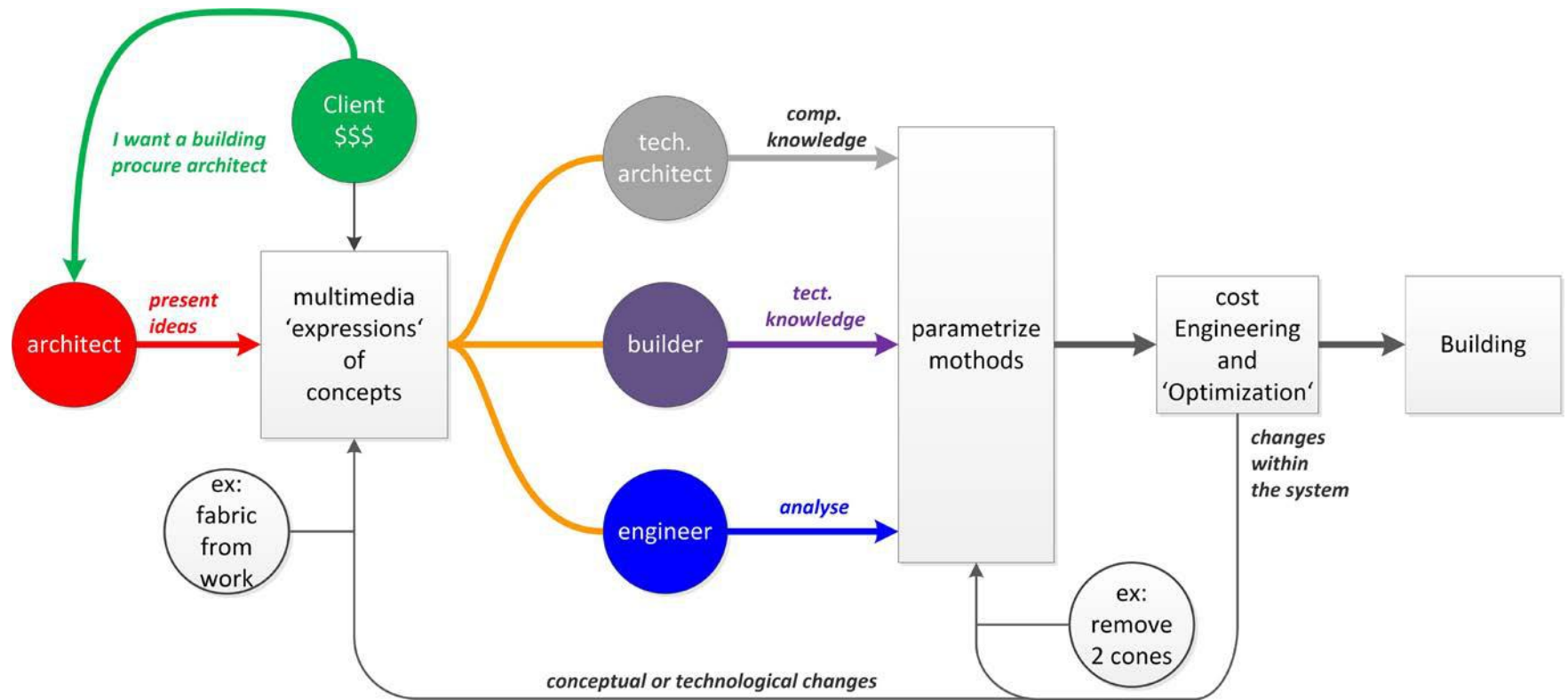
Conventional approach



© M. Mutlu, L. Potapova, S. Silverstein, J. Sundberg, M. Watabe (2009)

Interdisciplinarity in education

Contemporary approach



© M. Mutlu, L. Potapova, S. Silverstein, J. Sundberg, M. Watabe (2009)

Project „balancing act“

Introduction

The design, planning and execution of buildings is a highly complex process, dependent on the expertise of numerous different specialists. The aim of this module is to determine, develop and reflect the art of interdisciplinary design between architects and engineers whilst working on a (small) design project for a “Wippe” (english seesaw).

“Wippen” is a word full of varying connotations, all of which imply a certain dynamic. However “die Wippe” or “Wippen” don` t only signify a physical phenomena but can also suggest other ideas, for example: equilibrium, repetition and fluctuation.

Project „balancing act“

Brief

The aim of this project is to carefully analyze the diverse interpretations of the concept of “Wippen” and to use these in the concept and design for a small but exciting urban intervention within Bremen. The designs should have a positive effect on the urban space and the people who use it.

Whilst the project brief does not specify a particular function, the design should have a clear purpose. The project should rely and benefit from an interdisciplinary team of architects and structural engineers working together to create an holistic conceptual and structural design within the city – a contribution to Bremen`s Baukultur and hanseatic history and tradition.

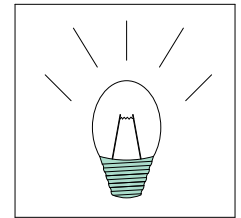
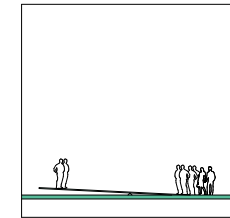
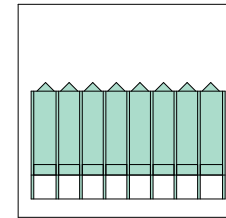
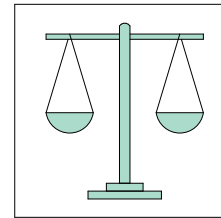
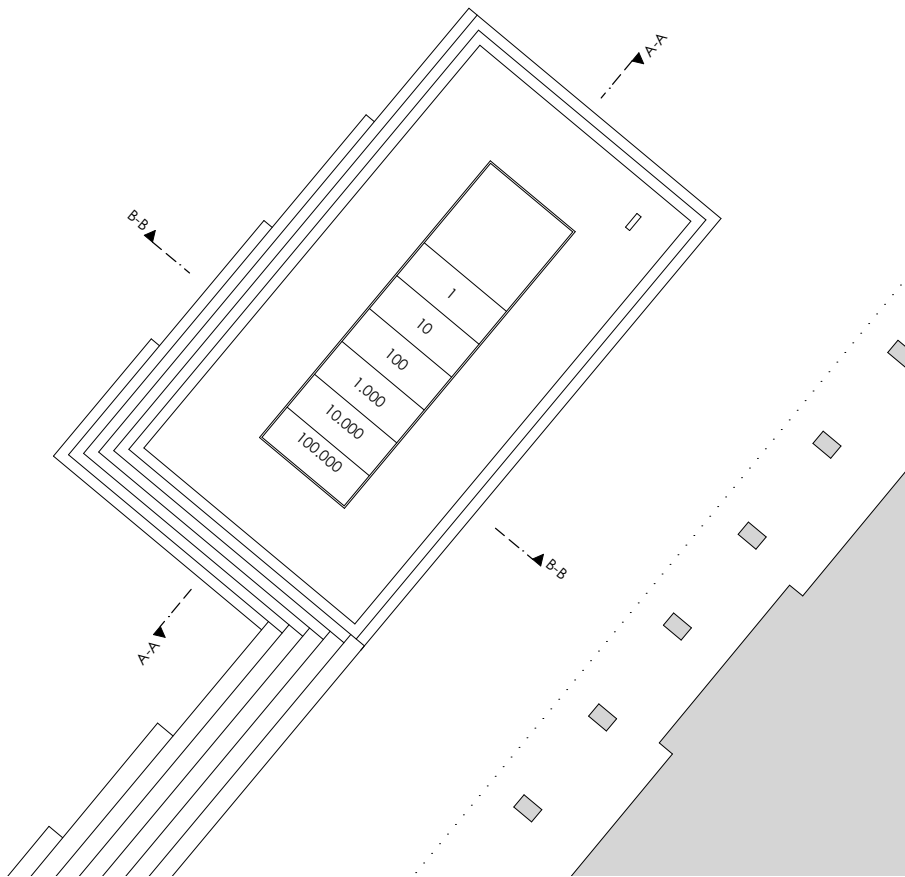
Project „balancing act“

Design Parameters

- The design must incorporate the idea of “wippen” in at least one sense
- The design solution must be dynamic
- The design must have a function or use beyond the incidental.
- The urban intervention must be within Bremen.
- The design must be constructed in a working model.

- The design process, especially between the disciplines, is of particular significance and should be clearly documented with sketches, calculations, text and working models.

Bremer Waage _ Felix Bertzbach und Tjark Eichhorn

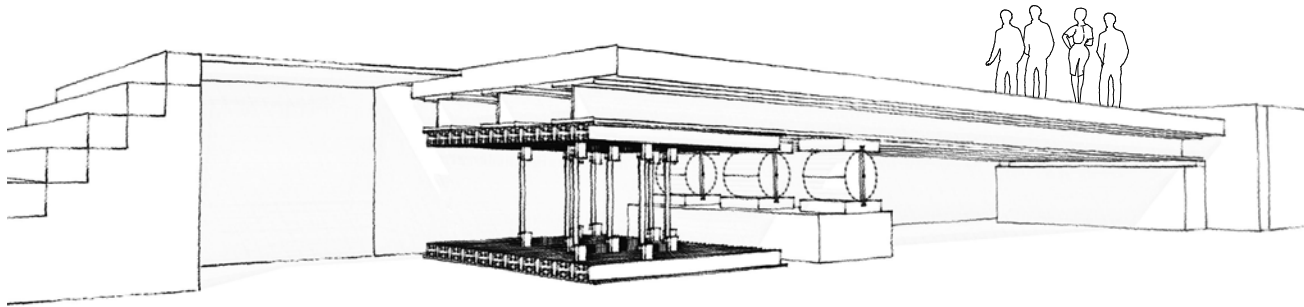


Konzept *concept*

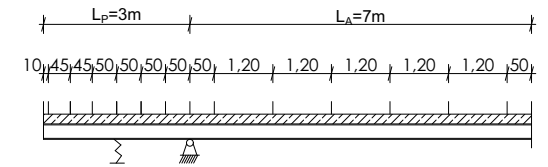
The concept of the design is to create a dynamic and interactive platform where the people of Bremen can answer current questions or air their opinions on poignant subjects.

„how many litres of water are contaminated by one drop of oil?“



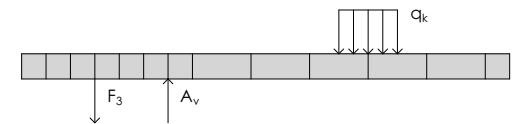


Perspektive *perspective*

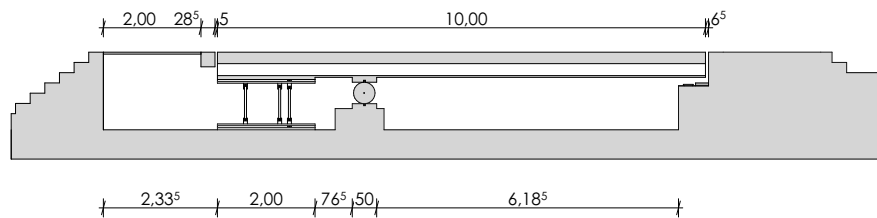


Statisches System *static system*

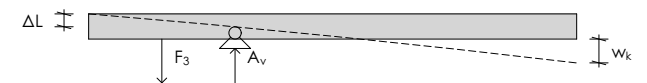
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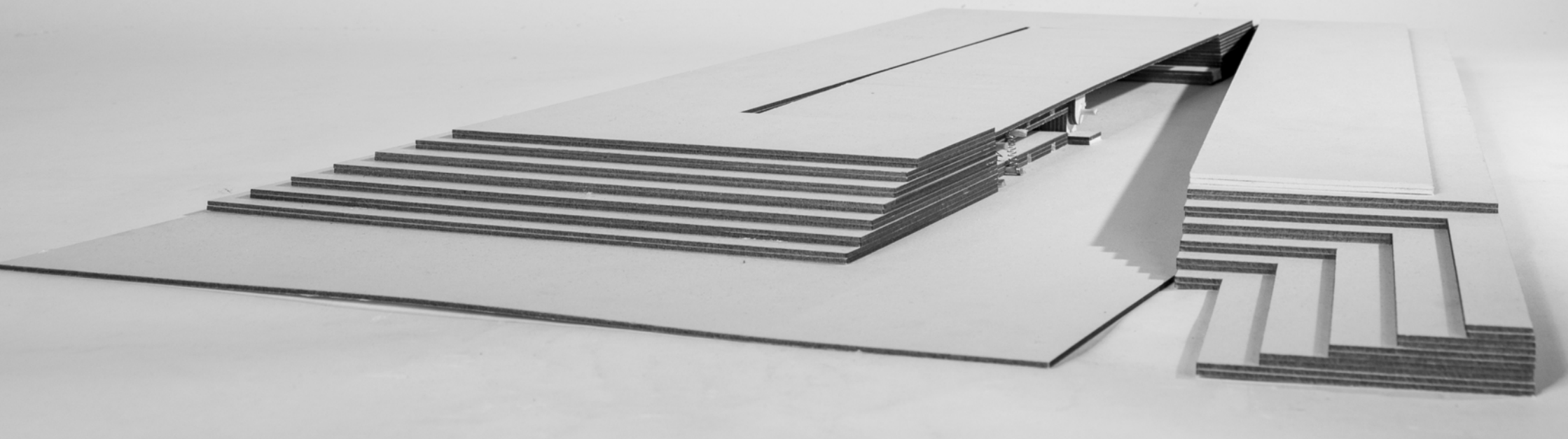
Freikörperbild *free-body diagram*



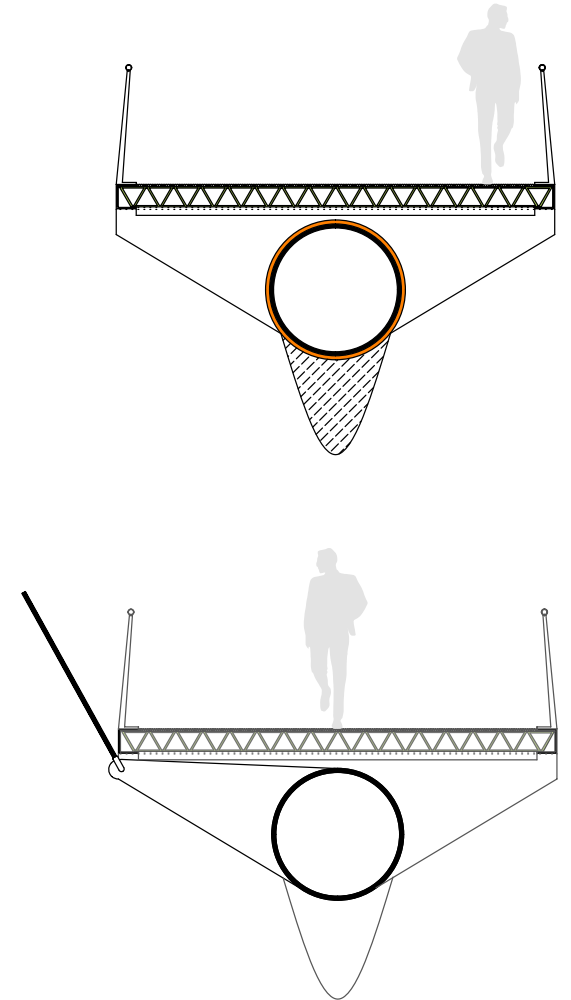
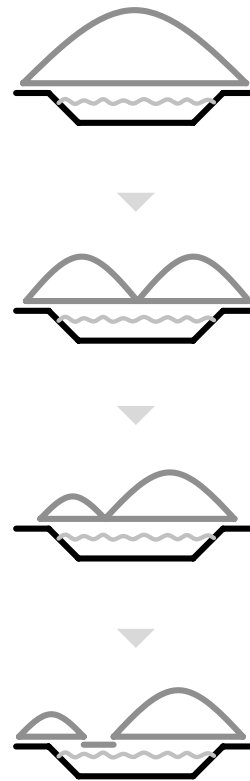
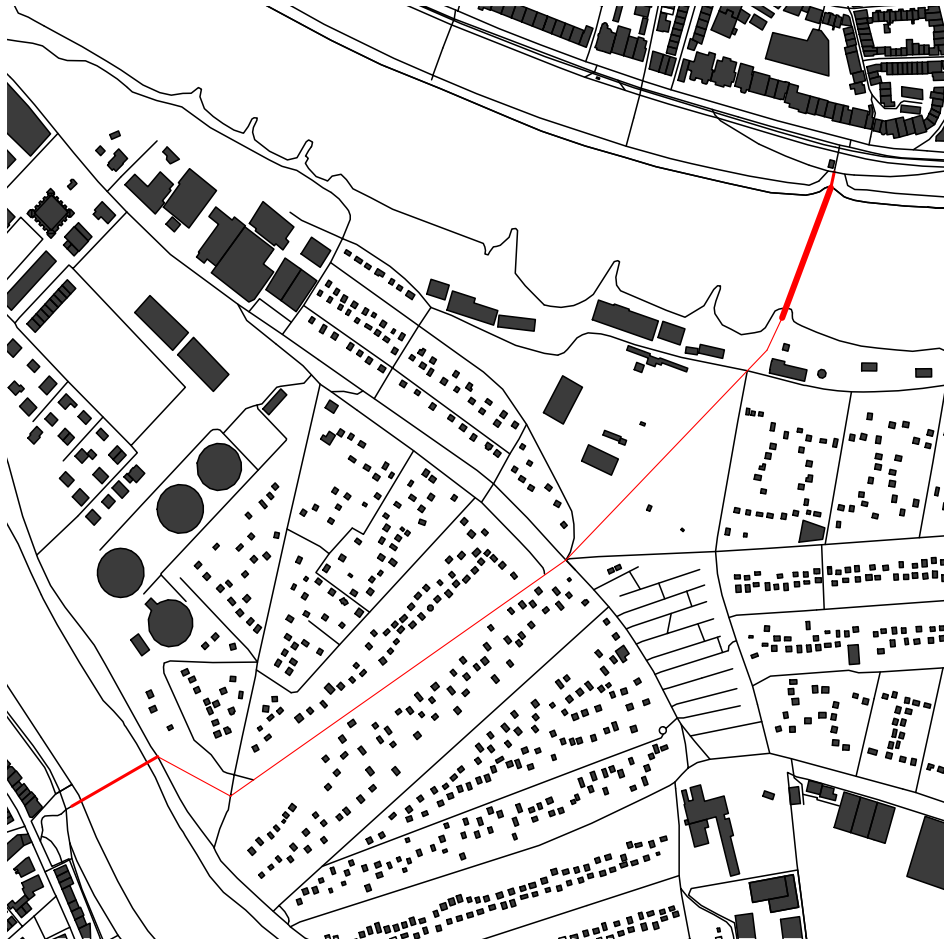
Schnitt *section* A-A 1:100

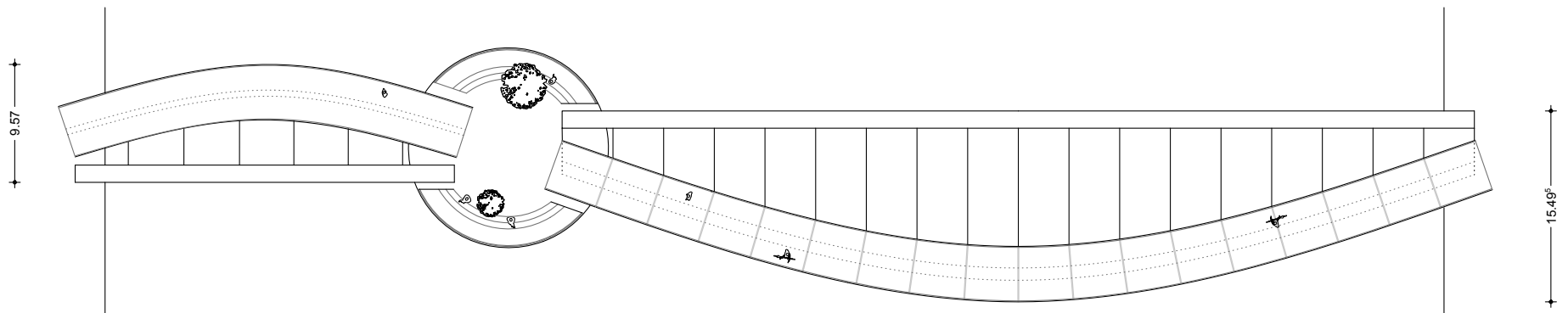
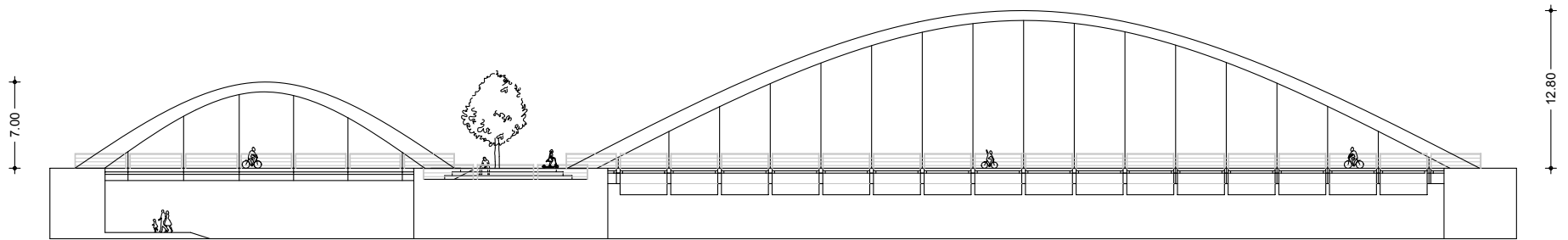


Biegelinie *deflection curve*

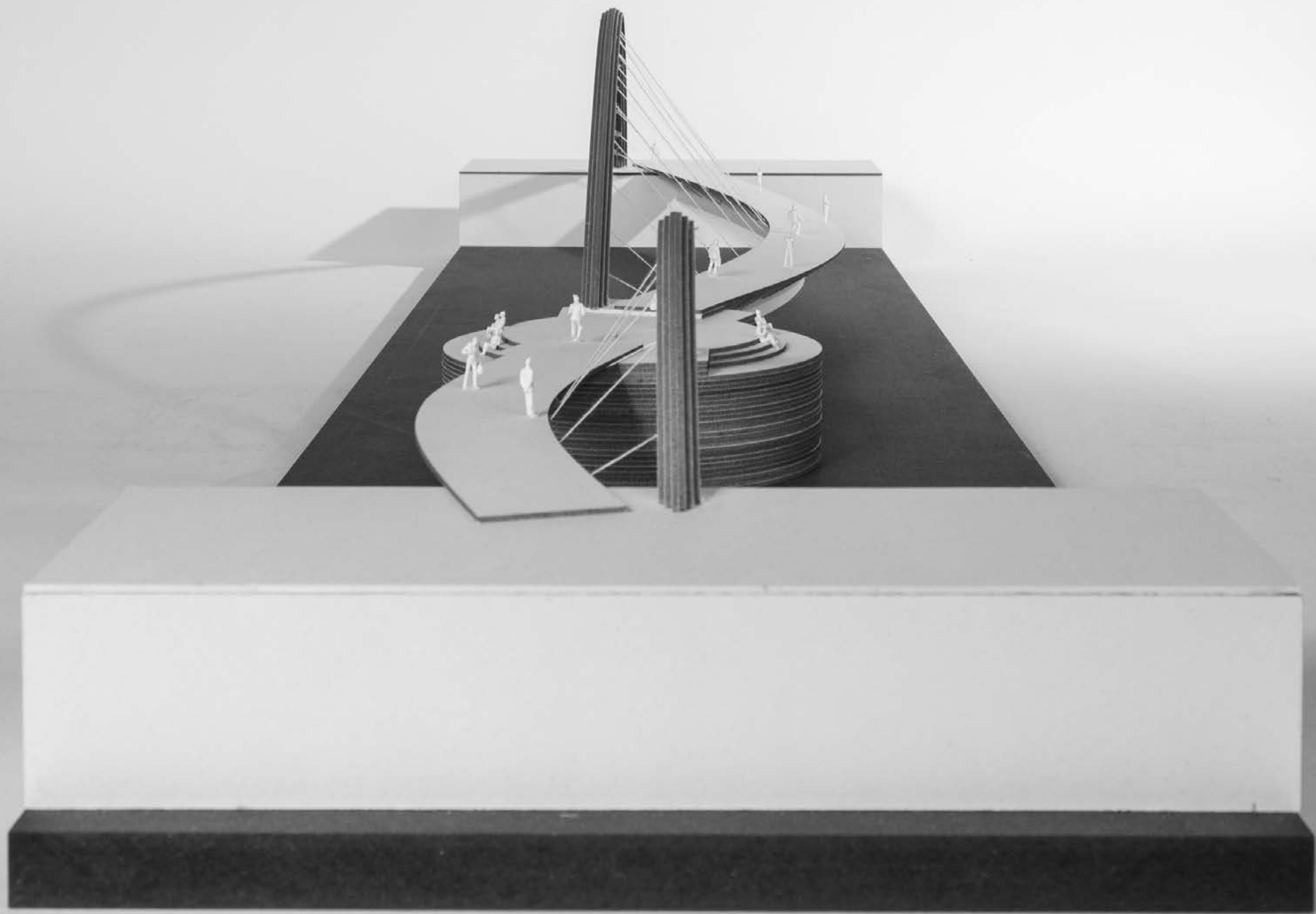


See Saw Bridge _ Aleksander Uyar, Arthur Müller and Laurens Hapke

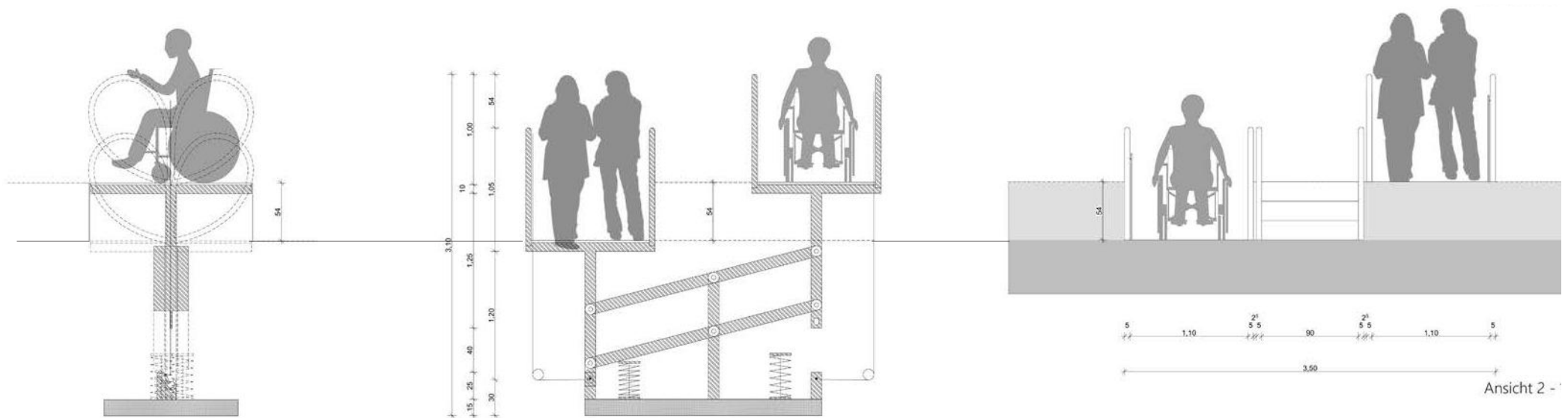
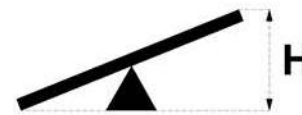
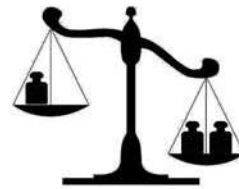






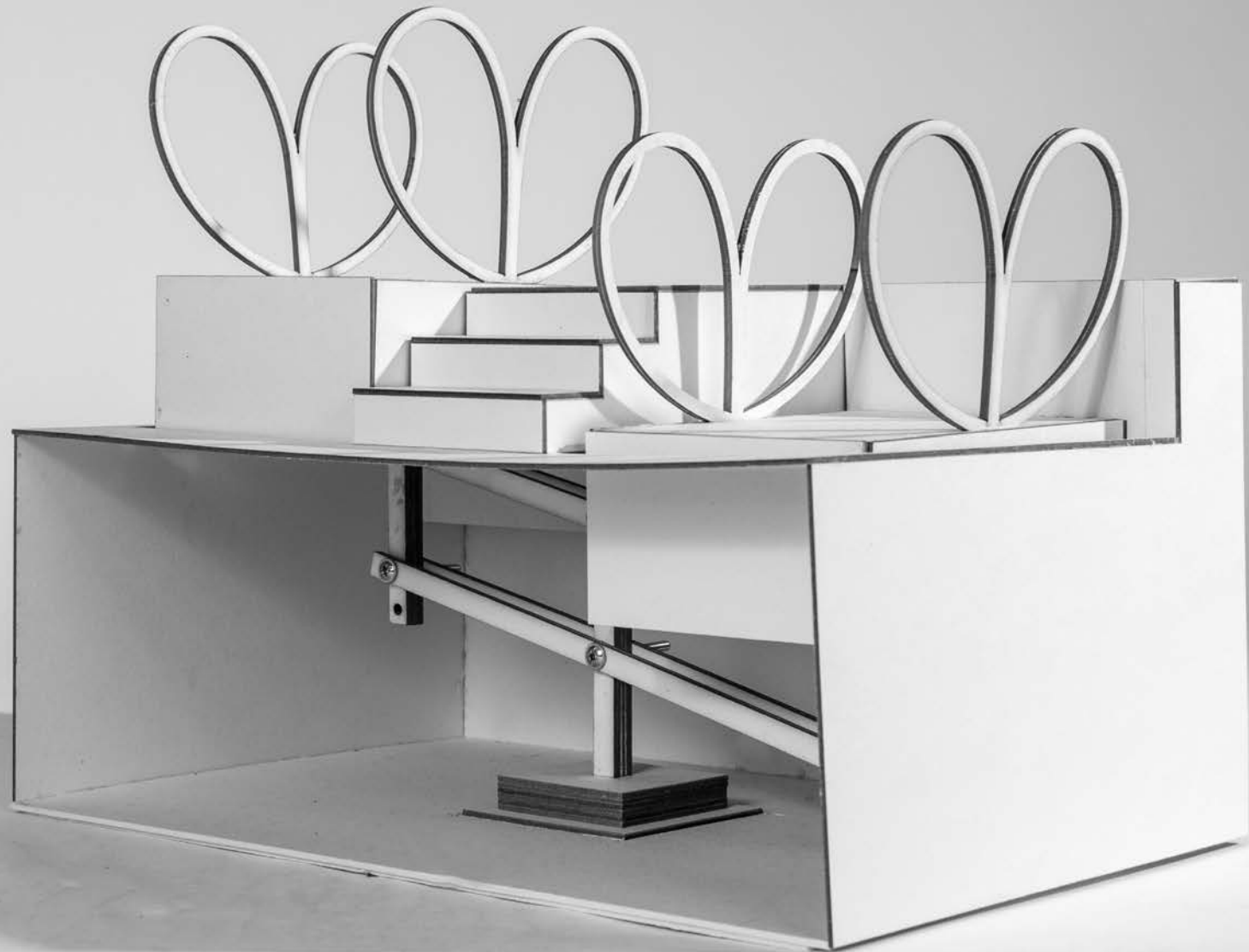


Barrier Free Seesaw Lift _ *Alexander Pols, Mohamed Mohamed*





Visualisierung Frontalperspektive



Balancing Act | Prof. Maria Clarke | Prof. Dr. Stephan Lochte Holtgreven | 19.09.2019

The Pavillion _ Clara Heuß, Jon Behnken und Stefan Beyersdorfer



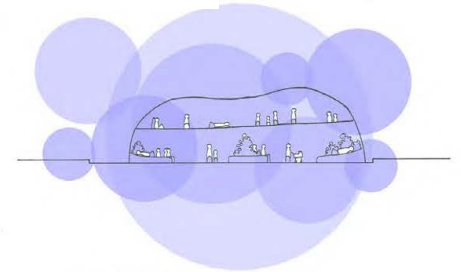
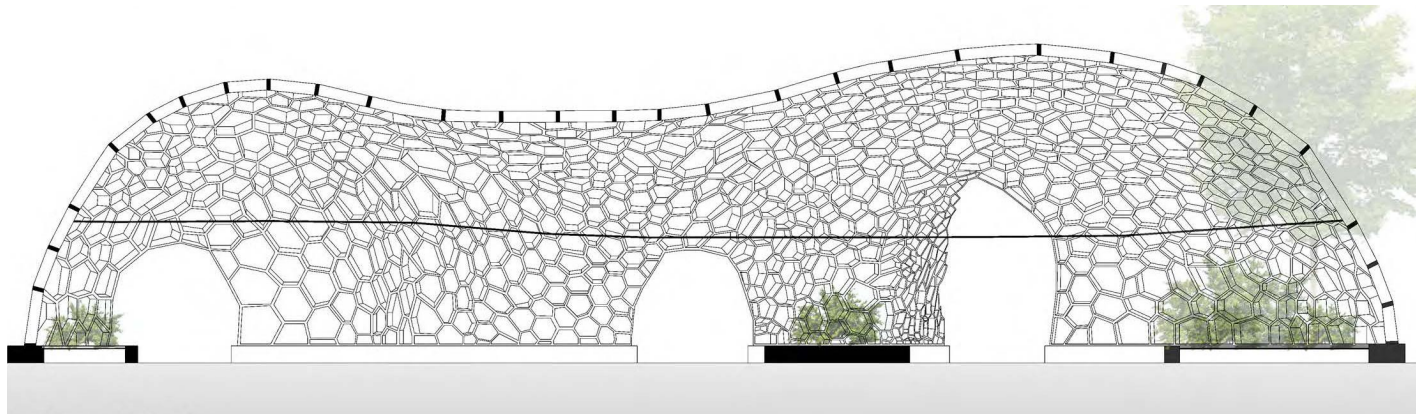
RECYCLED
recycled



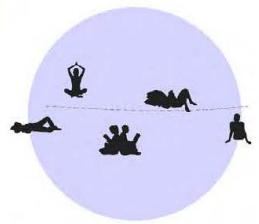
SCHWINGEN
swinging

BALANCE
balance

AUF UND AB
up and down



VERANSTALTUNGEN
events



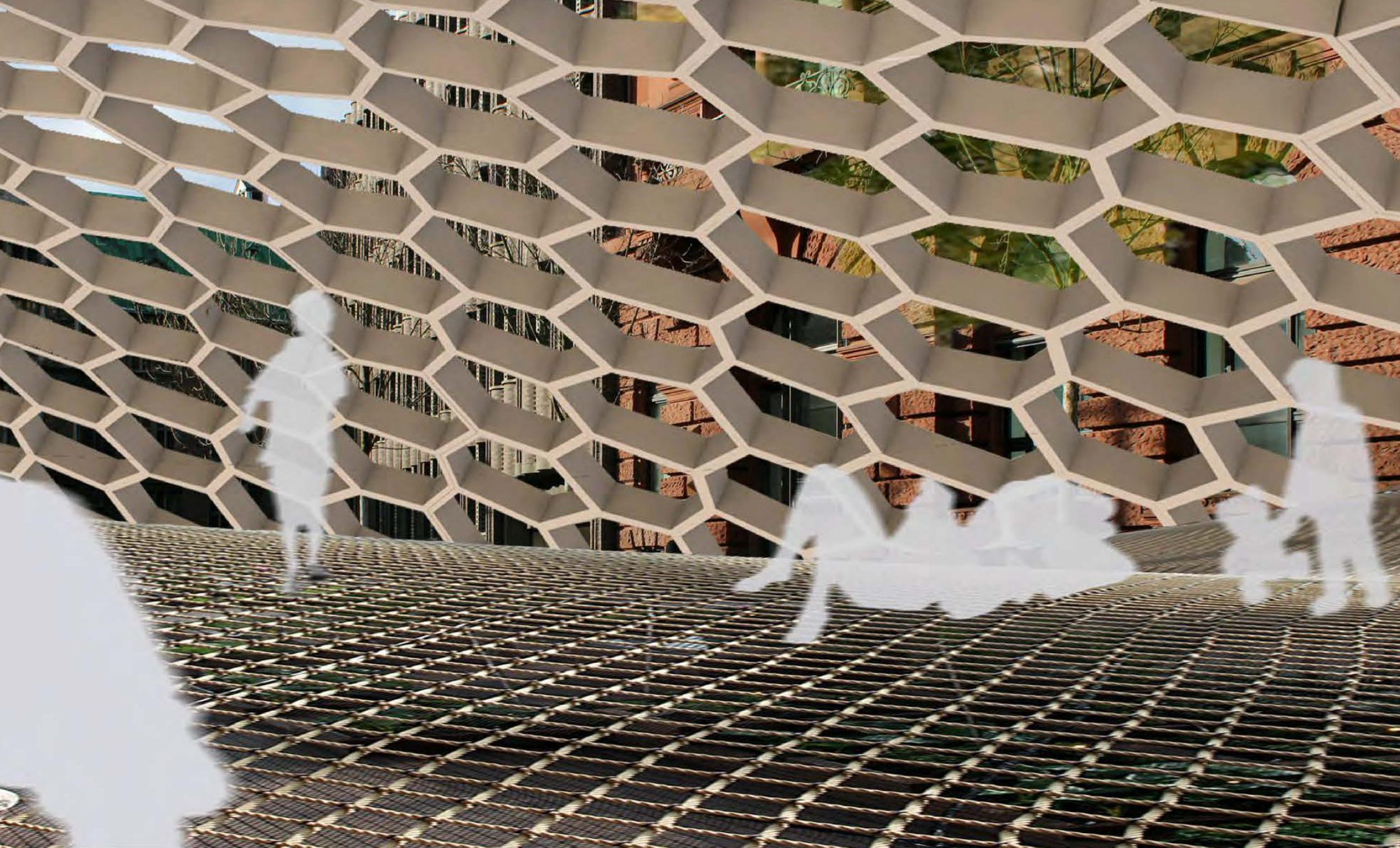
ENTSPANNEN
relaxation



JSSICHT
9W



AKTIV
active



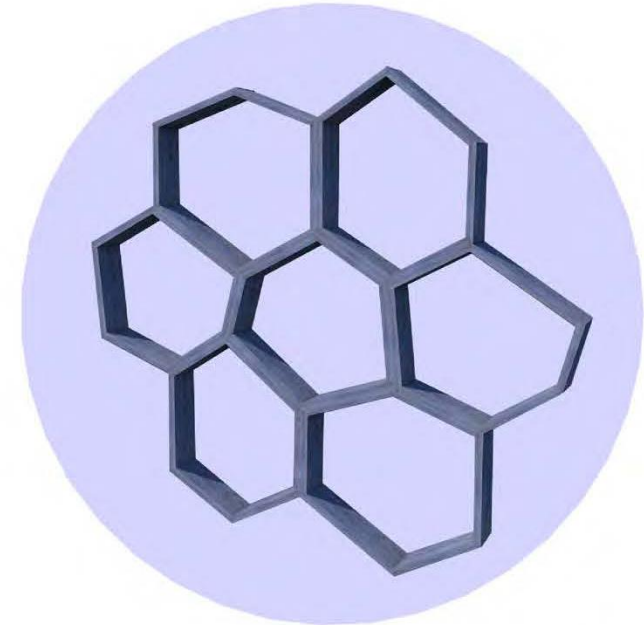


PLASTIKFLASCHEN
plastic bottles

GLASFASERN
glass fiber



EINZELNES MODUL
single part

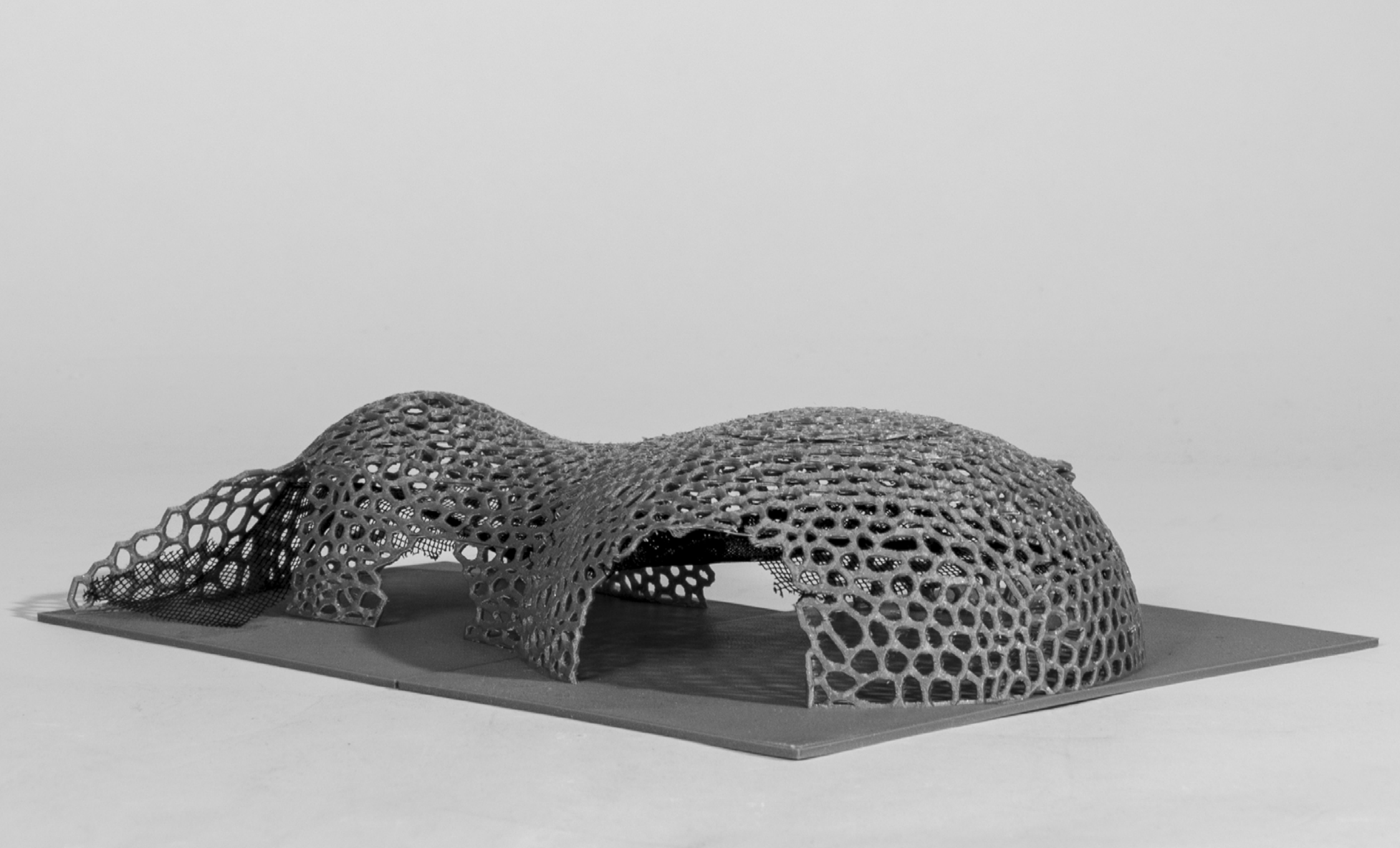


ZELLSTRUKTUR ELEMENT
cell structure part

Um auf das aktuelle und wichtige Problem der Verschmutzung der Meere durch Plastikmüll aufmerksam zu machen besteht der Pavillon aus recyceltem Kunststoff, der aus den Ozeanen gesammelt wird.

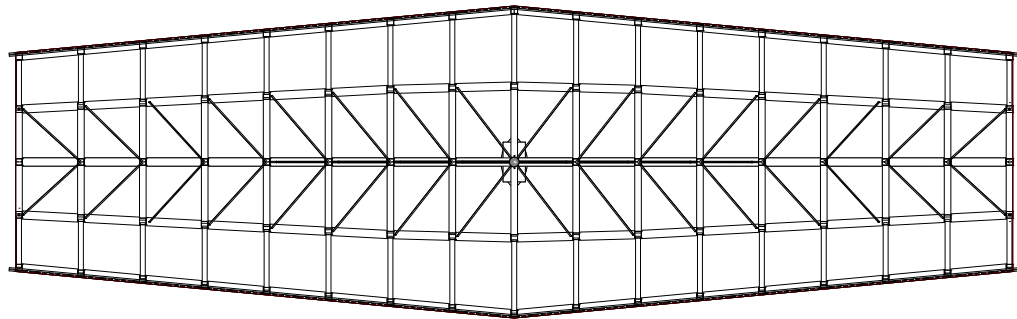
In Verbindung mit Glasfasern wird das Plastik eingeschmolzen und in die Zellenstruktur geformt, welches den Kontrast zwischen dem organischen Leben und die Vergiftung dessen durch Kunststoffe widerspiegeln.

To draw attention to the pollution problem of the sea by plastic waste, the pavillion will be made out of recycled plastic fished out of the sea. Combined with glass fiber it will be melted in a cell structure to represent the contrast between organic life and its contamination by plastic.

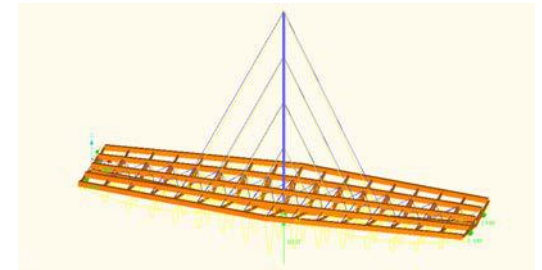
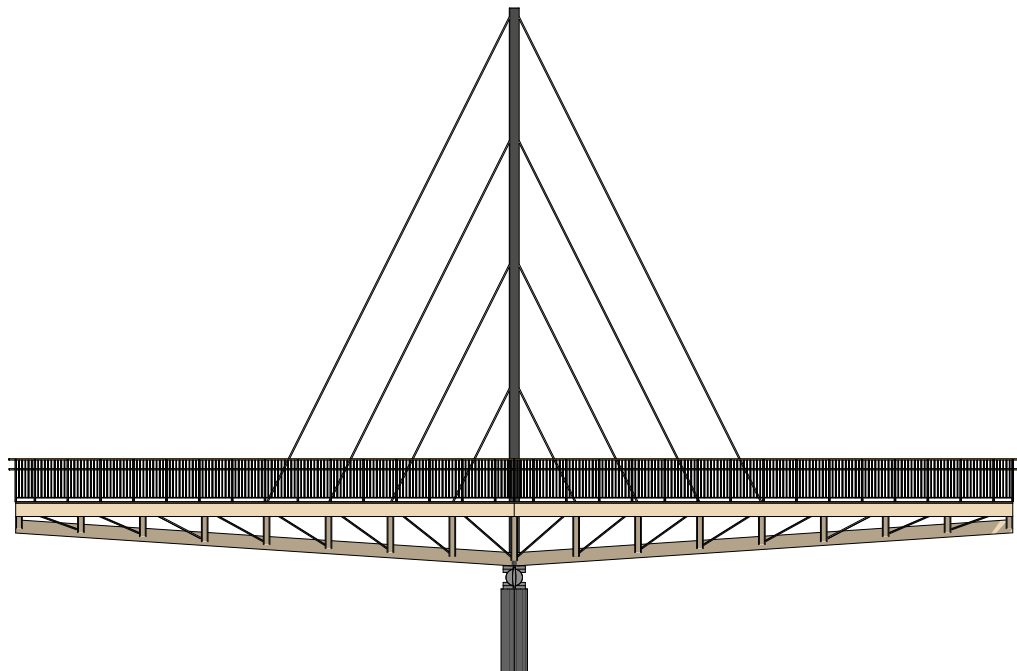


Torfsail _ Tjark Riehl und Holger Weustink

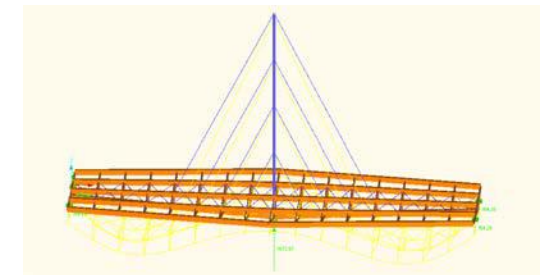




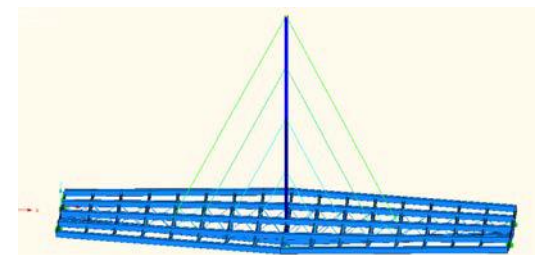
Grundriss 1:100
floorplan



Verformungsnachweis unter Eigenlast
Deformation analysis under dead load



Verformung unter Volllast
Deformation under full load



Spannungsverteilung
tension distribution

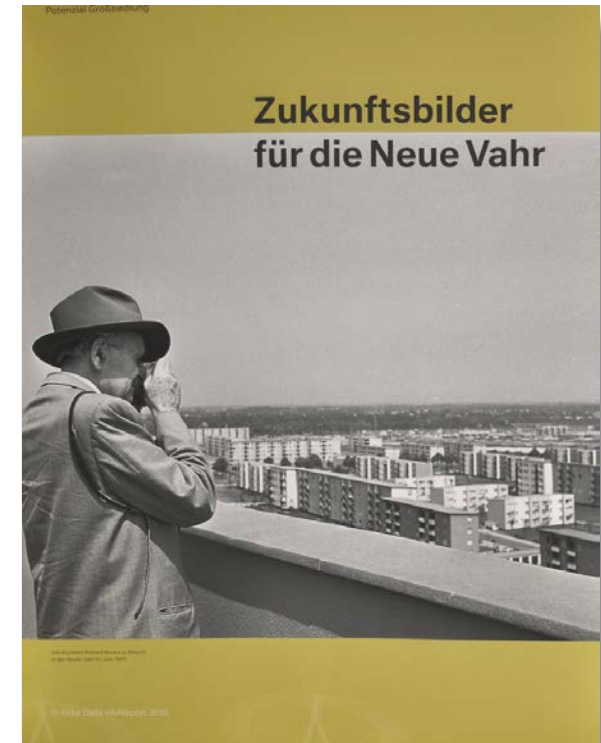




Project „balancing act“ _ excursion Berlin



Project „Neue Vahr 2035“

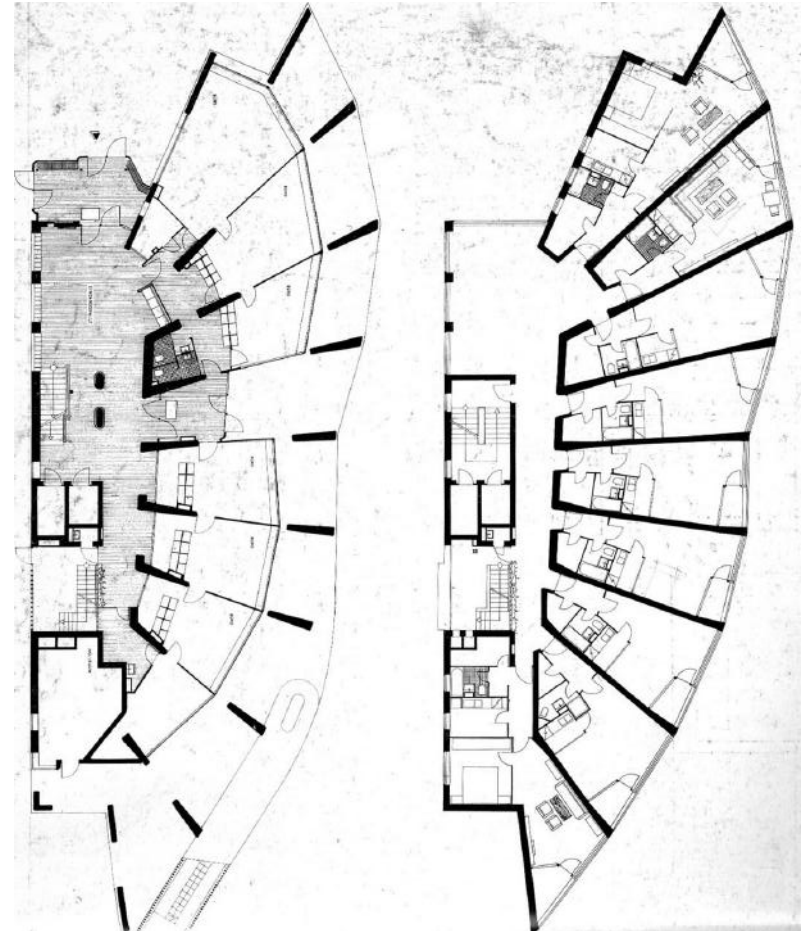


Project „Neue Vahr 2035“

„Neue Vahr“, Bremen

- 1945: Deficit of 100.000 apartments.
- 1956: Gewoba commissioned the architects May, Hüllen, Hafemann, Reichow and Bilau to plan apartments, terraced and detached houses.
- 1957-1962: Construction of the „Neue Vahr“ with 11,800 apartments for 30,000 inhabitants on 218 acres of land.
- 1961: Completion of the 22-storey „Aalto-Hochhauses“

Project „Neue Vahr 2035“



Project „Neue Vahr 2035“

Processes and Goals (Gewoba)

Review of whether the residential district, in the eyes of the residents, still meets the demands of today's urban design expectations and the social changes that have taken place.

Guidelines and support for potential future additions and modifications to the original urban concept that can be used in future planning processes.



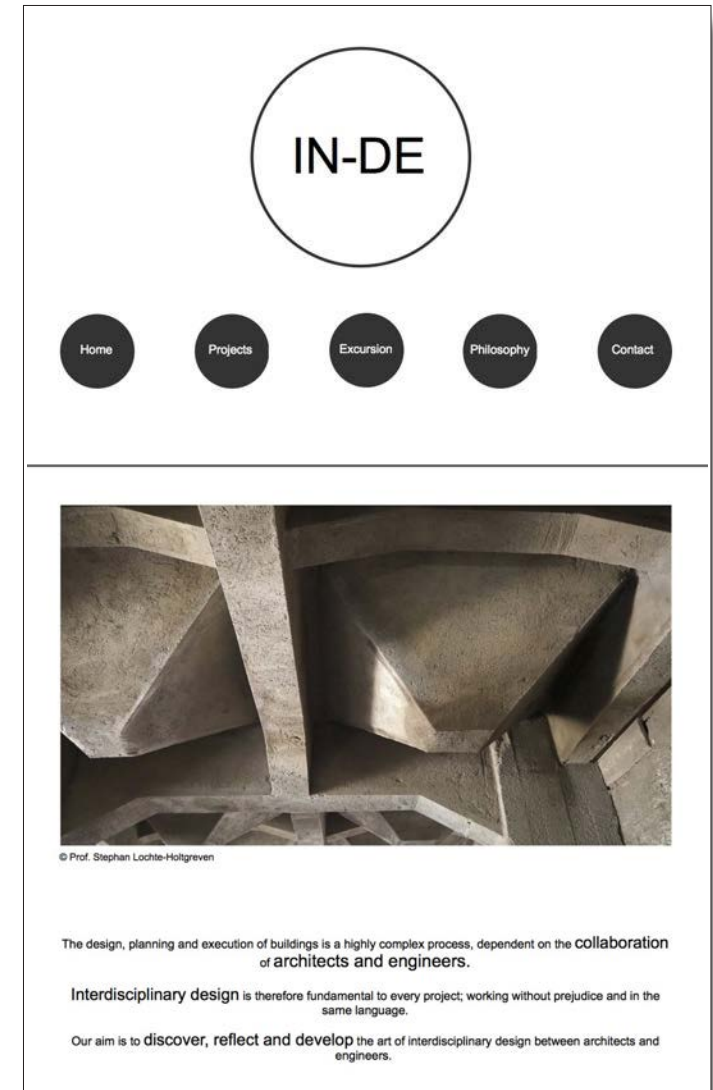
Project „Neue Vahr 2035“

Brief for the Module INDE in WS 19/20 _ *draft*

- Localization of an area in the Neue Vahr for the design of a small building or space that creates a flexible place of dialogue for the residents. The students must consider the urban planning, socio-cultural aspects, architectural and structural planning with a view to the project being constructed within the next year.
- The space must be multi-functional but also be able to accommodate other more ancillary uses, for example as a digital citizens office.



Summary and Outlook



IN-DE

Home Projects Excursion Philosophy Contact

© Prof. Stephan Lochte-Holtgreven

The design, planning and execution of buildings is a highly complex process, dependent on the **Collaboration** of **architects and engineers**.

Interdisciplinary design is therefore fundamental to every project; working without prejudice and in the same language.

Our aim is to **discover, reflect and develop** the art of interdisciplinary design between architects and engineers.

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