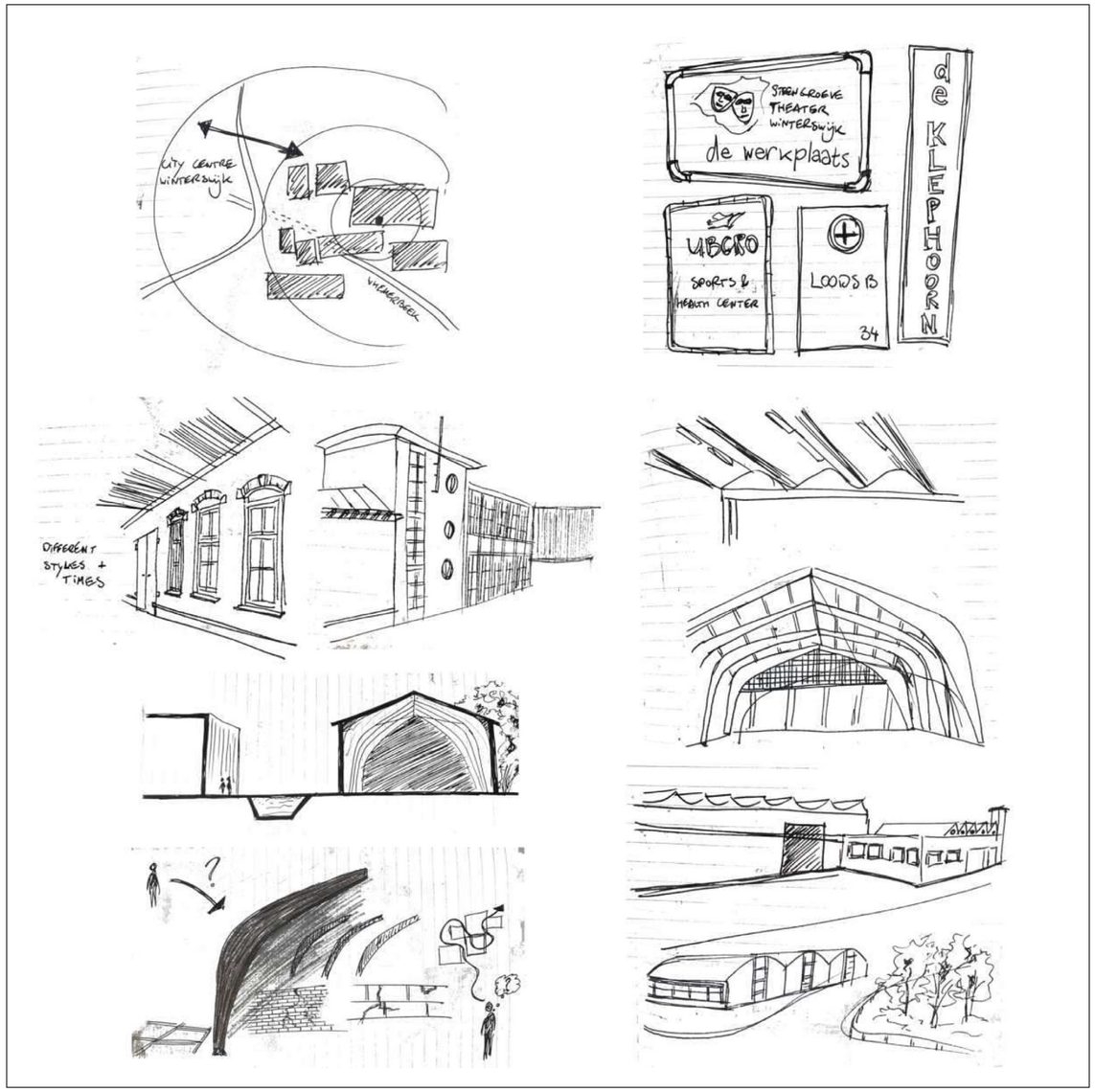
TIMBER TOWN

AN INCLUSIVE MIXED-USE AREA IN WINTERSWIJK,
BUILT FOR AND OUT OF WOOD

DESIGN PORTFOLIO
JULIËTTE ZEGERS

DRAWING

FIRST SKETCHES



P1 PRESENTATION

04-11-2019

HIELKJE:

RESEARCH QUESTION:

- What is the significance and representative character of the skin of an industrial building and how is it related to the processes happening inside?

DESIGN QUESTION:

- How to integrate the original representative character of the skin of an industrial building and its function within a new sustainable design for the future?

FRANK:

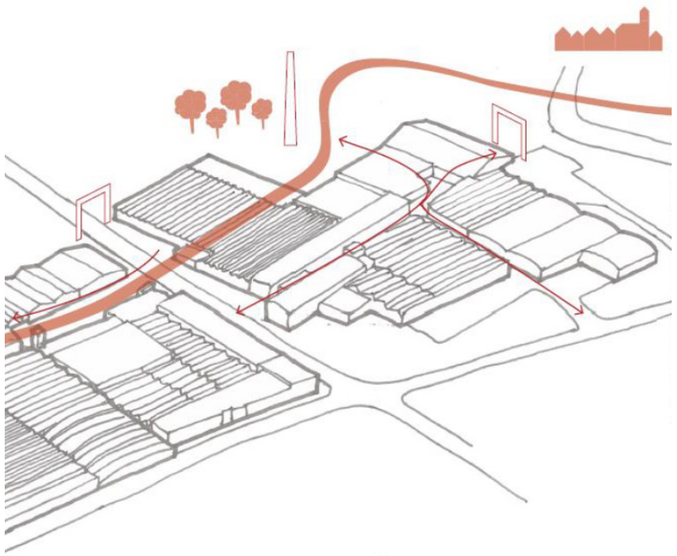
- What is sustainability in your question?
- Architectural qualities of the buildings? Are conditions the same as qualities?

OTHER:

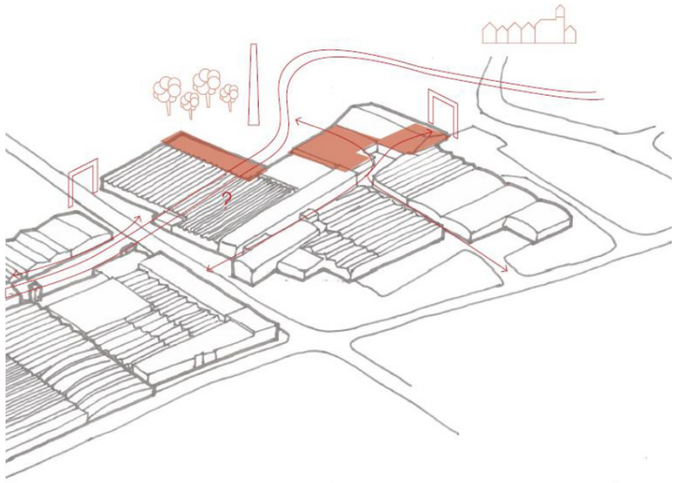
- DETAIL: https://inspiration.detail.de/startseite.html
- Circularity: https://tudelft.on.worldcat.org/search?queryString=ditte+gerding

CULTURAL VALUE

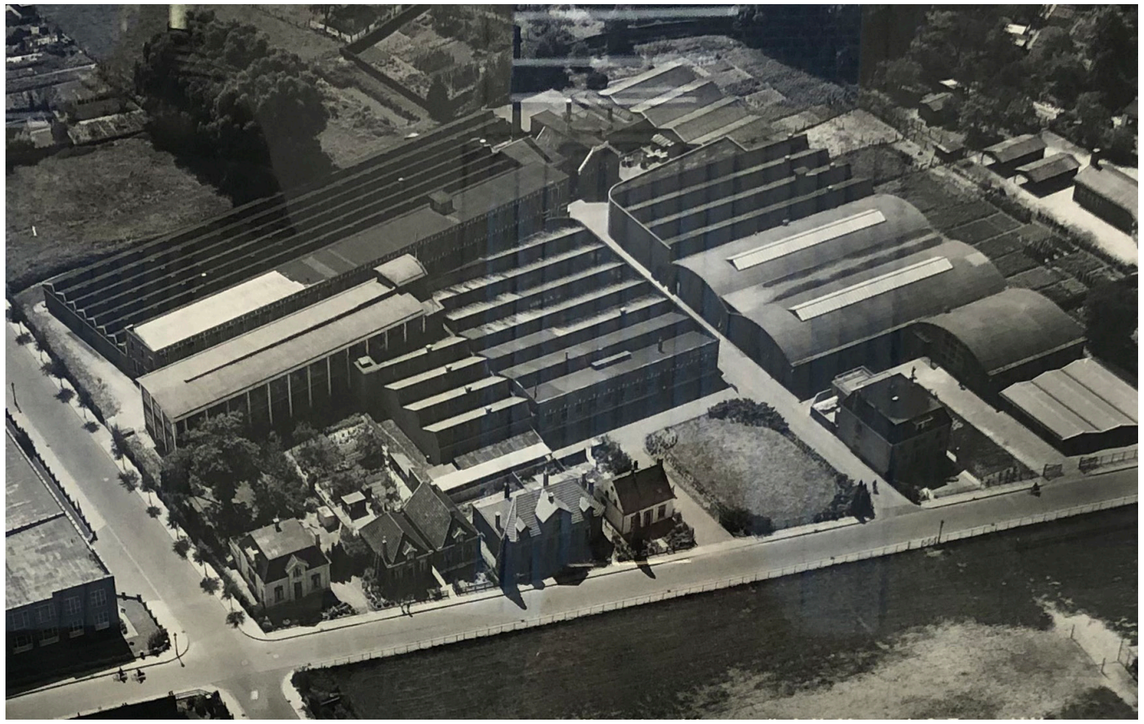
OPPORTUNITIES



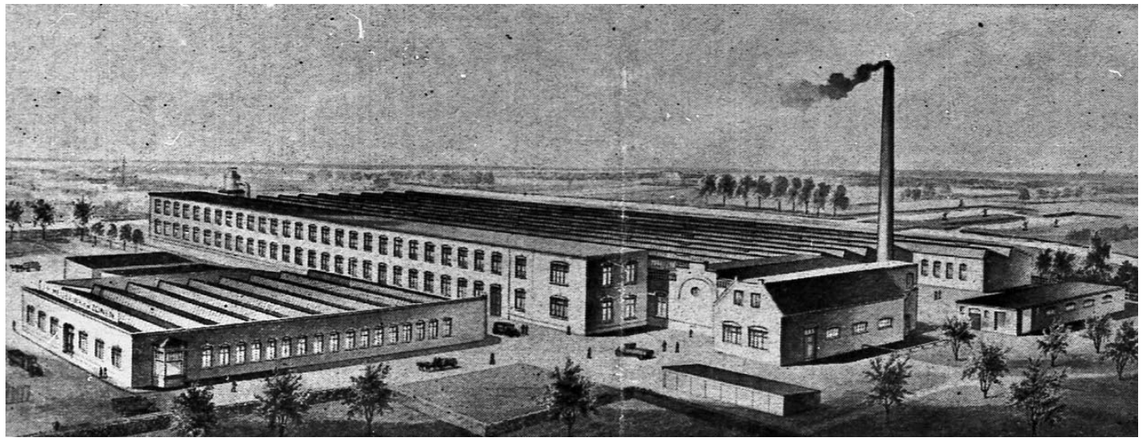
DILEMMAS



CULTURAL VALUE STANCE



- KEEP AS MUCH AS POSSIBLE
- Original connections
- Original building block
- Chimneys/high element
- Ensemble
- Typologies
- Spirit of place
- Whemerbeek



PROGRAMME

DEMOGRAPHIC DECLINE IN WINTERSWIJK

Problems/facts:

- Winterswijk is shrinking
- The Achterhoek (11 municipalities) itself is not shrinking (Lochem, Zutphen and Brummen compensate for this)
- Less babies are to be born
- Age group 20 to 40 years old is moving out
- People from 40 years old are moving towards Winterswijk (same amount of people that has left)
- The Achterhoek holds a lot of innovating manufacturing companies, but without a sufficient amount of employees
- The Achterhoek Board wants to attract 27.000 workers before 2025 (the biggest part will have to be HBO educated)
- Through the Regio Deal, the Achterhoek receives 40 million euros from the government and the province to attract people to the region

Haggeman, H. (2018). *Jongeren van 20, 21 jaar verlaten in flinke aantallen de achterhoek*. Retrieved from https://www.destentor.nl/achterhoek/jongeren-van-20-21-jaar-verlaten-in-flinke-aantallen-de-achterhoek~aaba8274/?referrer=https://www.google.com/

Haggeman, H. (2019). Krimp in Achterhoek nog ernstiger dan gedacht. Retrieved from https://www.gelderlander.nl/doetinchem/krimp-in-achterhoek-nog-ernstiger-dan-gedacht~af3b020a/?referrer=https://www.google.com/

Haggeman, H. (2019). *Krimp in Achterhoek omdat er te weinig vruchtbare vrouwen zijn*. Retrieved from https://www.gelderlander.nl/doetinchem/krimp-in-achterhoek-omdat-er-te-weinig-vruchtbare-vrouwen-zijn~a22c4b73/

Zandee, P. (2019). *Regio Deal Achterhoek: 40 miljoen voor streek*. Retrieved from https://www.tubantia.nl/achterhoek/regio-deal-achterhoek-br-40-miljoen-voor-streek~ac2cee6e/?referrer=https://www.google.com/

Opportunities:

- People are moving back from the city towards the countryside
- Dwellings are way cheaper in Winterswijk
- Serenity and nature around Winterswijk
- Regional stimulation project for working at home (close to industrial areas Arnhem-Nijmegen, Twente and the Ruhrgebied) is needed
- Education in healthcare, but certainly in manufacturing and technology because this has been overlooked the past years (together with Germany)
- Improvement of the accessibility towards Germany
- Culture tourism is important
- Sports and leisure facilities in Winterswijk are sufficient, culture is lacking
- Business environment in Winterswijk is very good and should be enhanced more to attract entrepreneurs and small businesses

Werkgroep Krimp Winterswijk. (2013). *Krimp biedt kansen!*. Winterswijk: eDruk

INITIATIVES IN WINTERSWIJK

- WIC (Work Innovate Center):	Thinktank for business people, graduation assignments, product innovation and knowledge development. Doesn't exist anymore because it has to be addressed on a larger scale.
- Achterhoek board:	Representatives of entrepreneurs, organizations and authorities who designed a vision on the spatial-economic programme of the Achterhoek.

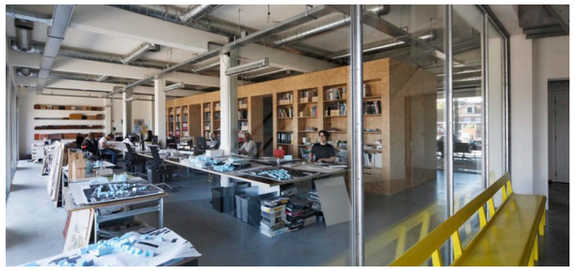
INDUSTRIEPARK/CULTUURFABRIEK, ULFT

- Ulft as a village is quite comparable to Winterswijk, only the latter holds more than twice as much inhabitants. They both are situated in Gelderland very close to the German border.
- Ensemble of seven buildings, less dense than our site
- It is situated next to a river and very close to the hinterland. The water brings a special vibe to the area.
- Programme with movie an theatre, restaurants, event spaces to rent and a square which can be used for events.

PROGRAMME

GASFABRIEK, MEPPEL

- One factory building where multiple entrepreneurs and businesses are housed
- Lively environment where the businesses can interact and exchange knowledge
- Programme with offices, spaces to rent and exhibition space



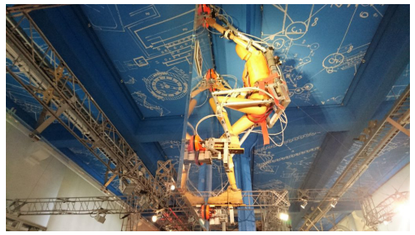
LOKALEN, LICHTENVOORDE

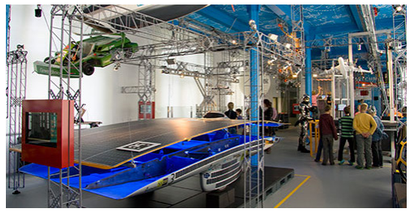
- An old elementary school where now creative people and artists take place
- A lot of activities happen inside and outside the building
- A programme linked to creativity: brainstorming, sharing knowledge, painting, gardening and many more things.

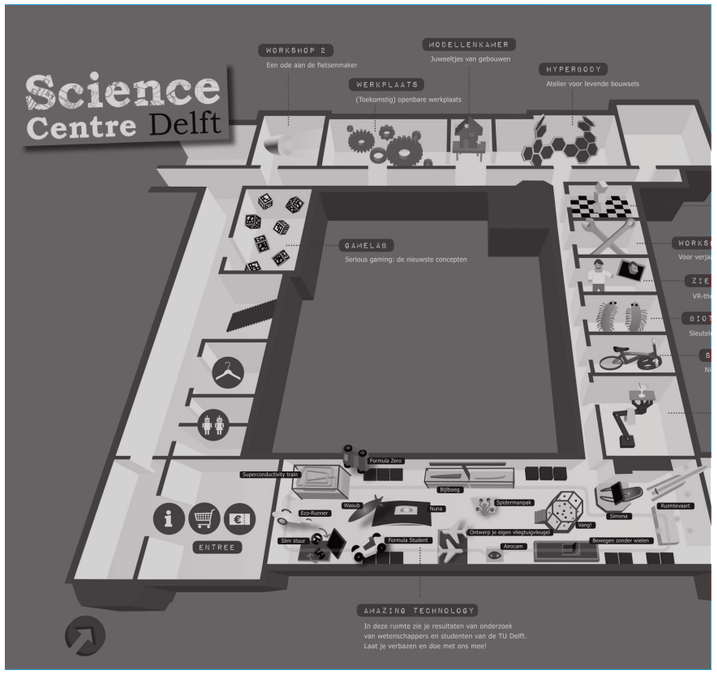
PROGRAMME

SCIENCE CENTRE TU DELFT

- A refurbished building which holds the virtues of the TU Delft
- The programme holds a museum which showcases the multiple prides of the university. What most stands out is the activities for children, consisting of workshops where the children can get to know technology and learn while playing.







NDSM, AMSTERDAM

- Amsterdam, way bigger city and industry on an immense scale
- Factory halls with less density than the Winterswijk site but much higher buildings, big spans
- Initiatives for young artists (art etc.) to have their own atelier / office
- A bottom up initiative where the idea is that people built and manage their own space

PROGRAMME

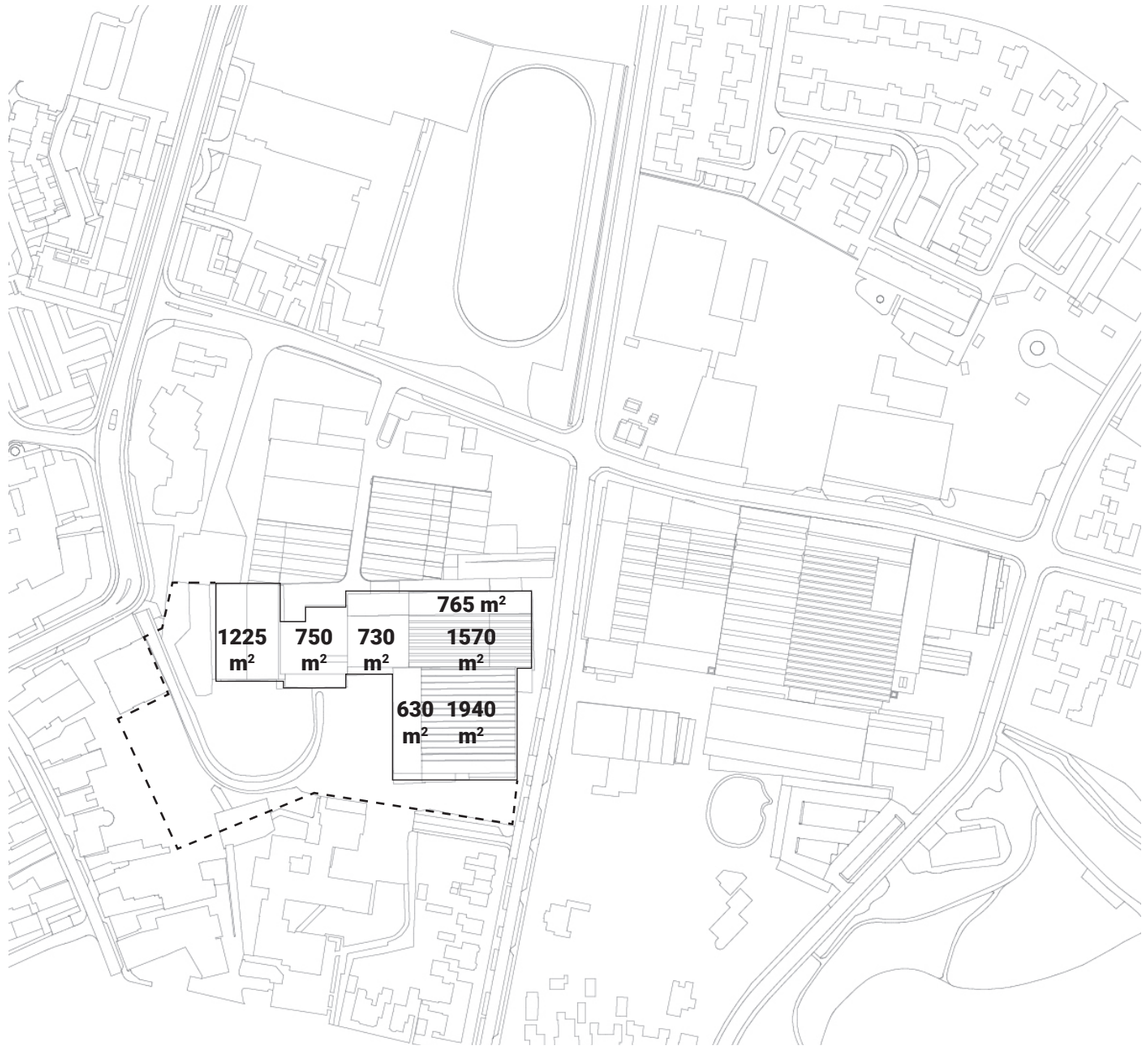
CURRENT FUNCTIONS

At the moment, there is a large variety of functions. This mixed-use is valued positively.

1. Staring Educatie
2. De Weelde zwembaden
3. D&F Afbouw
4. SDO Montage
5. Grooters bouw & renovatie
6. Self Storage
7. Senzo living
8. Tuunte
9. Woninginrichting Aanhuis.nl
10. De Rooy Fysiotherapie
11. Gilde Winterswijk
12. Roy's Gym
13. VR Moulds
14. Museum Fabriek
15. Eendracht
16. Harm Kookt
17. Academie Schilderkunst
18. PPE Factory
19. De Werkplaats
20. Cordaro
21. Clan Destino
22. Escape room
23. Korda
24. Church
25. Church events
26. Special education

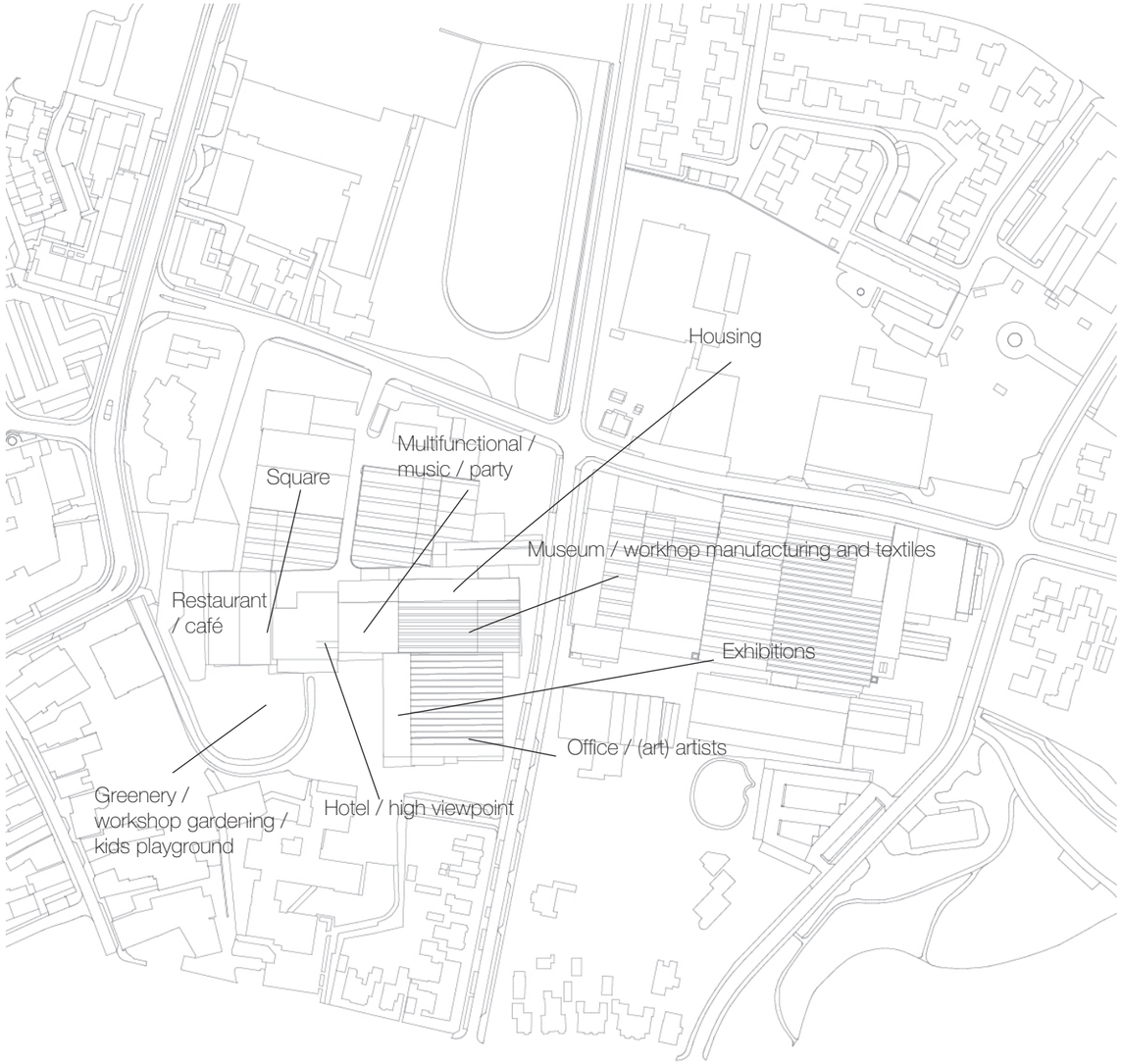
PROJECT AREA

Based on the research, this will be the project area. The crosses indicate new connections that have to be made through demolishing (part of) the buildings.



PROGRAMME

EXPLORATION



TARGET GROUP

The goal of the project is to provide those elements which are pointed out by the multiple organizations and the municipality in order to attack shrinkage and to help the tourism business.

For that reason the focus of the project will be on the age group between 18 and 40 years old and their children. As for tourists, the same age group will be addressed. Of course, the main goal is to make a pleasant public area for everyone of Winterswijk.

PROGRAMME TO TYPOLOGY

Two aspects form the base of the programme:

- In the first place the different typologies. All chosen buildings have different dimensions, different shapes and different appearances. This allows for the programme to vary from building to building.

- Secondly, flexibility will be very important. For the whole area to be durable for the future, the programme needs to be flexible and the new design also has to allow for this (Municipality of Winterswijk, 2019).

Restaurant / café
Enhancing the activity in the area and representative as a gate. Just as the theme of circularity is very important in the new development of the area, the restaurant could also use this theme.

Multifunctional space
The multifunctional space can be used for multiple events, for example the orchestras of Winterswijk who do not fit in Boogie Woogie. It can also be used for parties for the youth.

Museum / workshops
A place where children, while playing, can get in contact with the history and virtues of Winterswijk. ‘Het Museum’ could be moved here. Themes: Agriculture, Textiles, Manufacturing.

Office
A large span building where small office boxes and ateliers can grow organically, according to the contemporary needs.

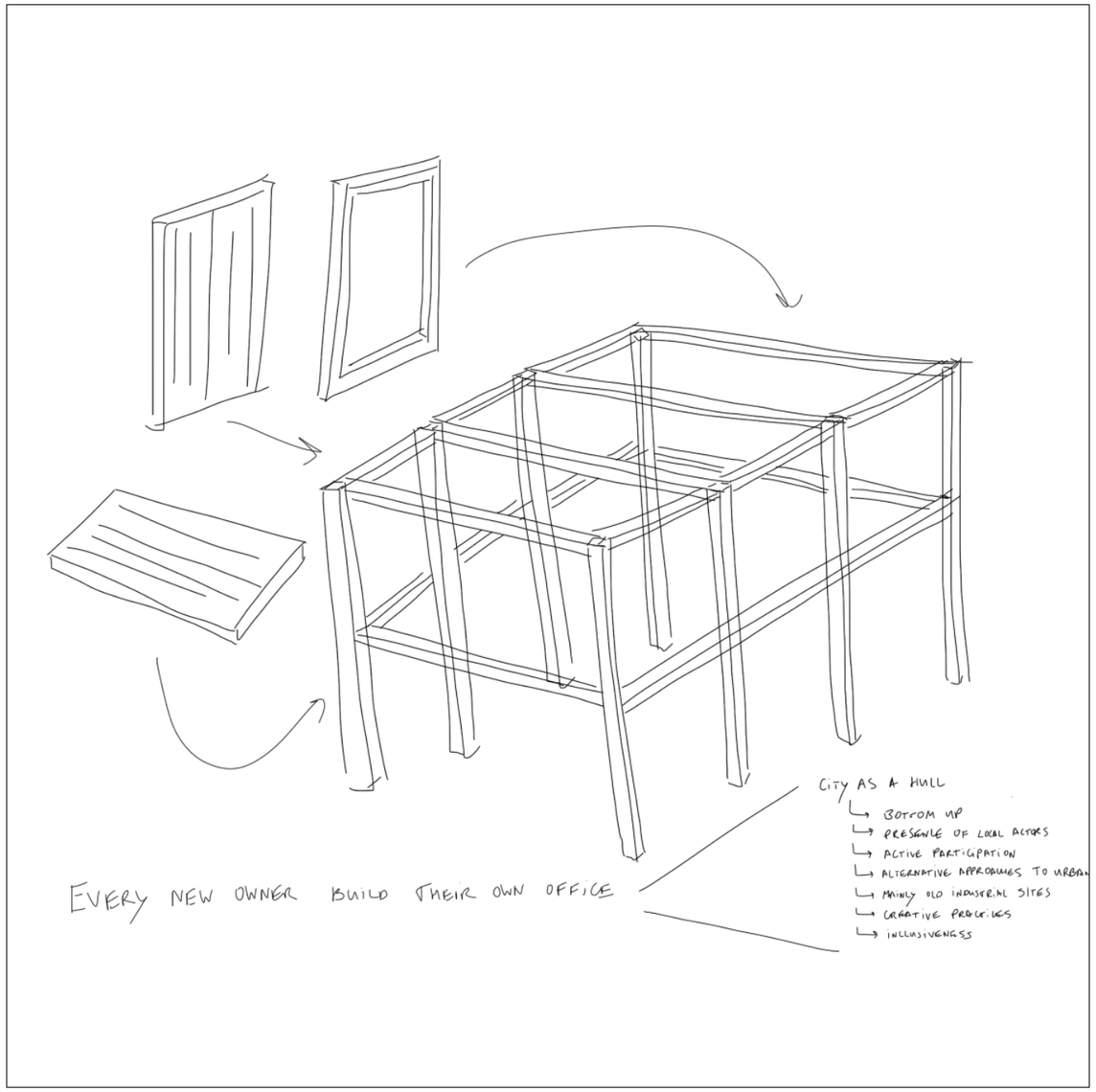
Exhibition space
Work of the artists could directly be displayed in this building part.

Hotel
Currently, no hotels for young people are situated in Winterswijk. With success of the area, this function could be added.

WEEKLY DRAWING

18-11-2019

PROGRAMME



INSPIRATION

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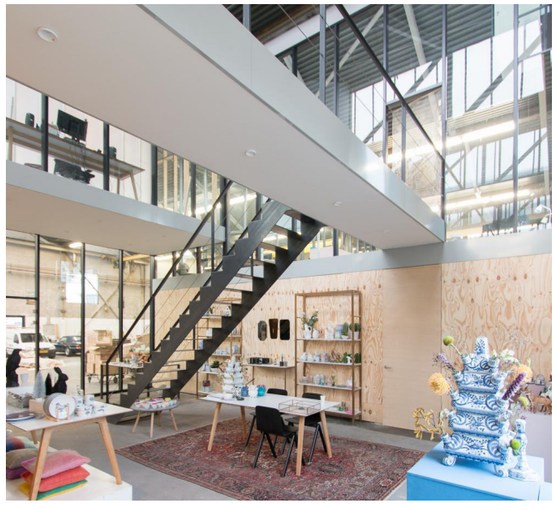

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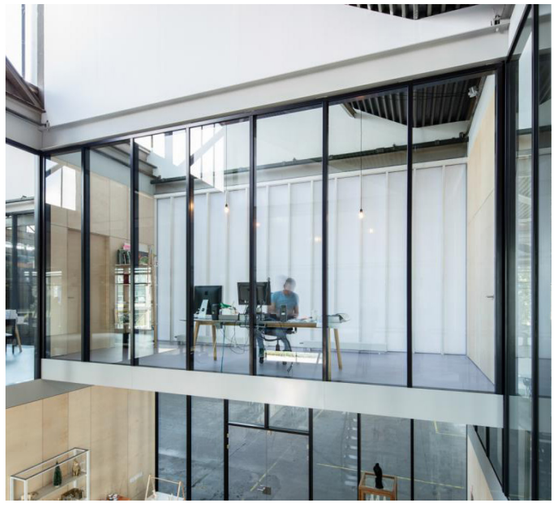

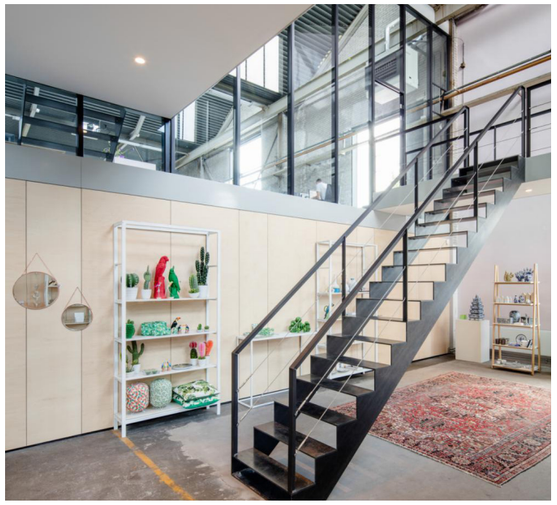

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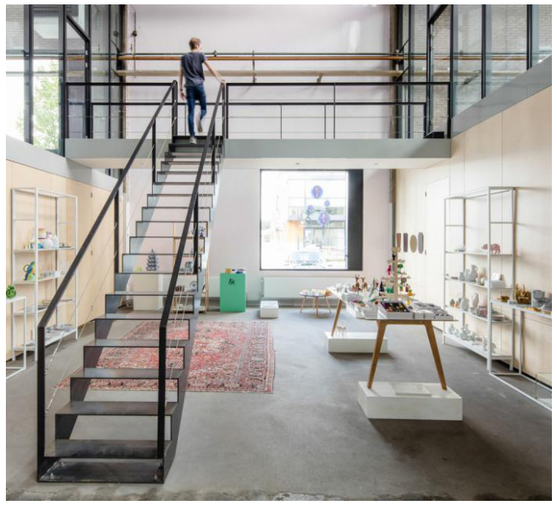
INSPIRATION



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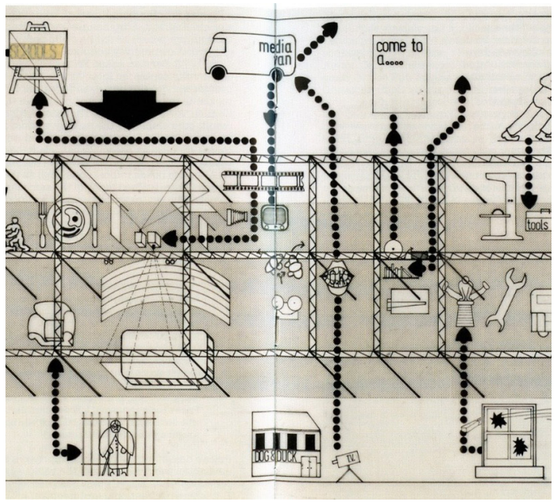
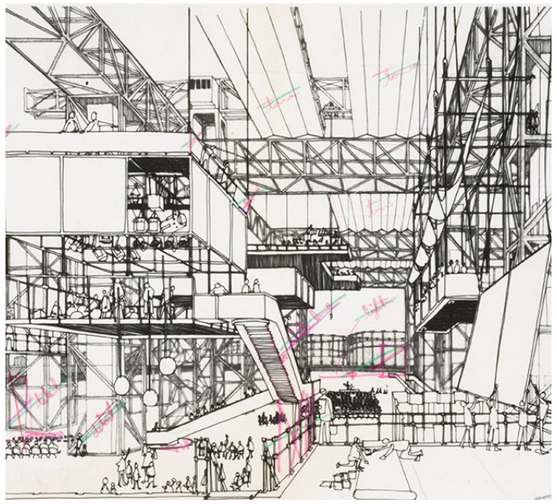
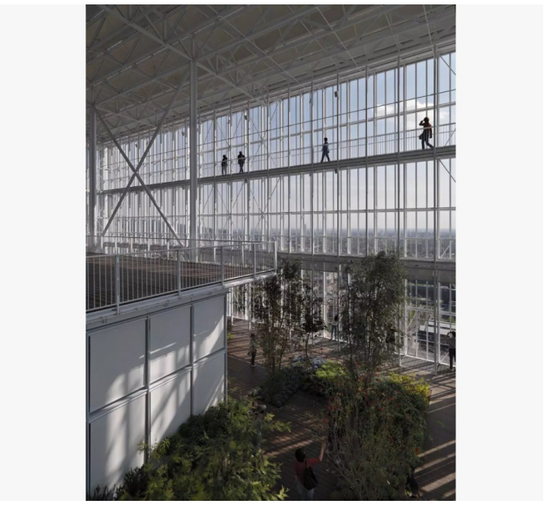


Cedric price paskplana

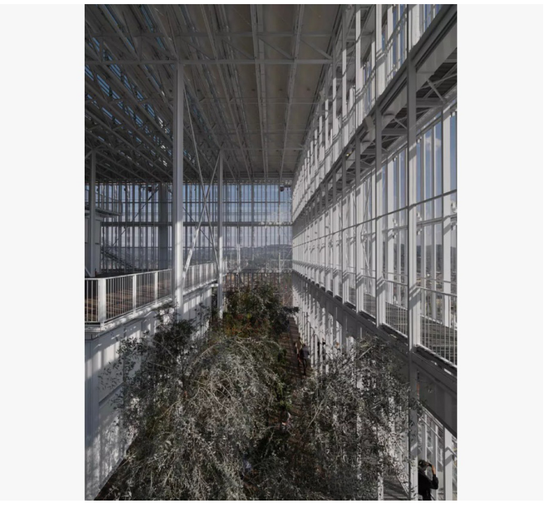


Siemens halske braunschweis



Renzo Piano

Renzo Piano



Renzo Piano

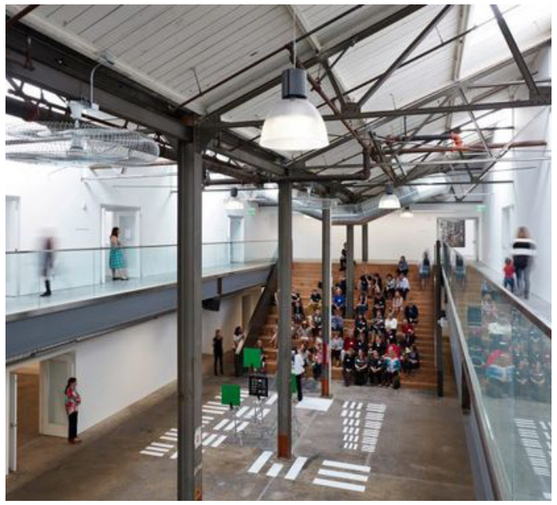
INSPIRATION

Ai Weiwei Studio

Ai Weiwei Studio

Ai Weiwei Studio

Ai Weiwei Studio

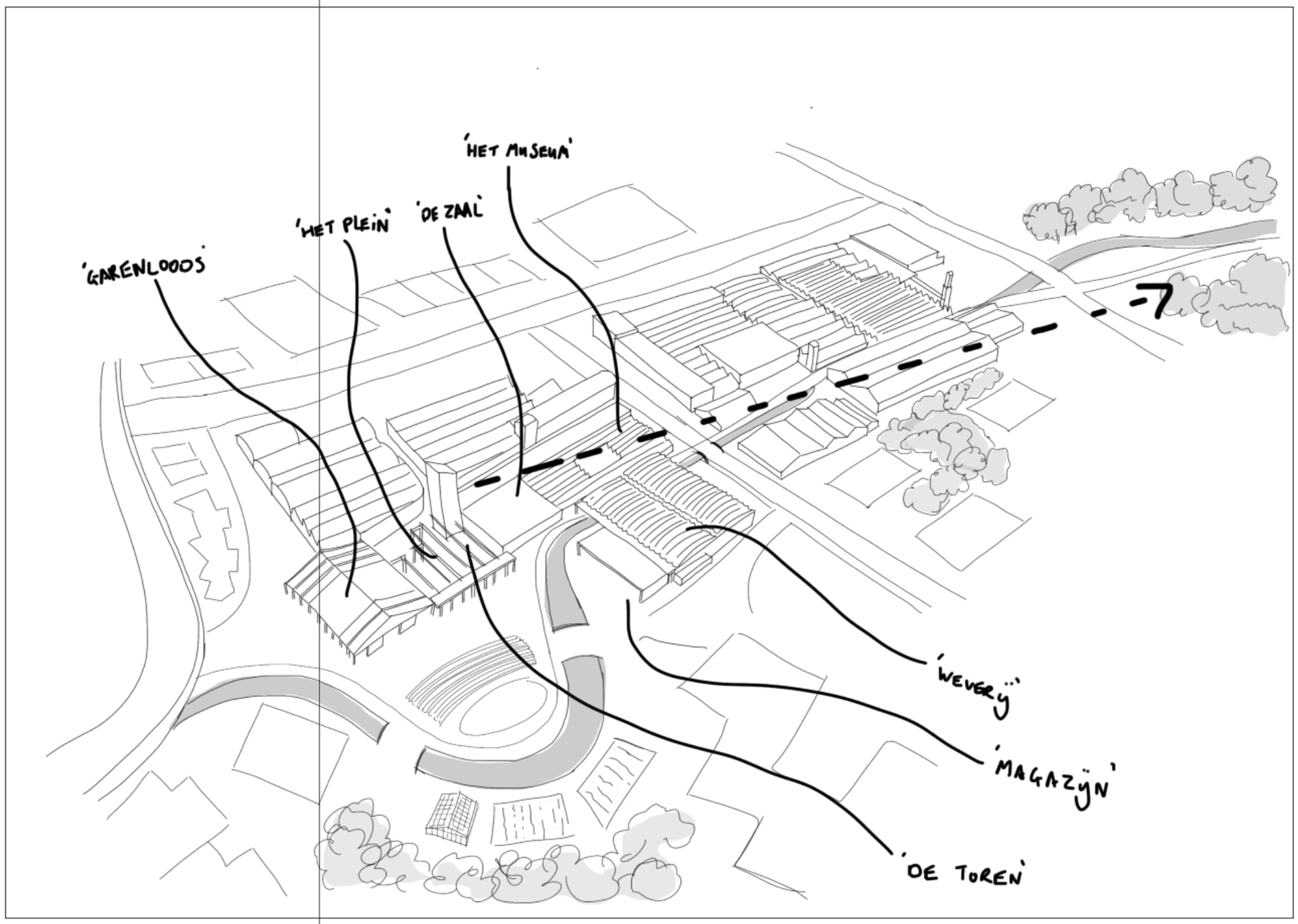


Keith Hunter

Space & Matter

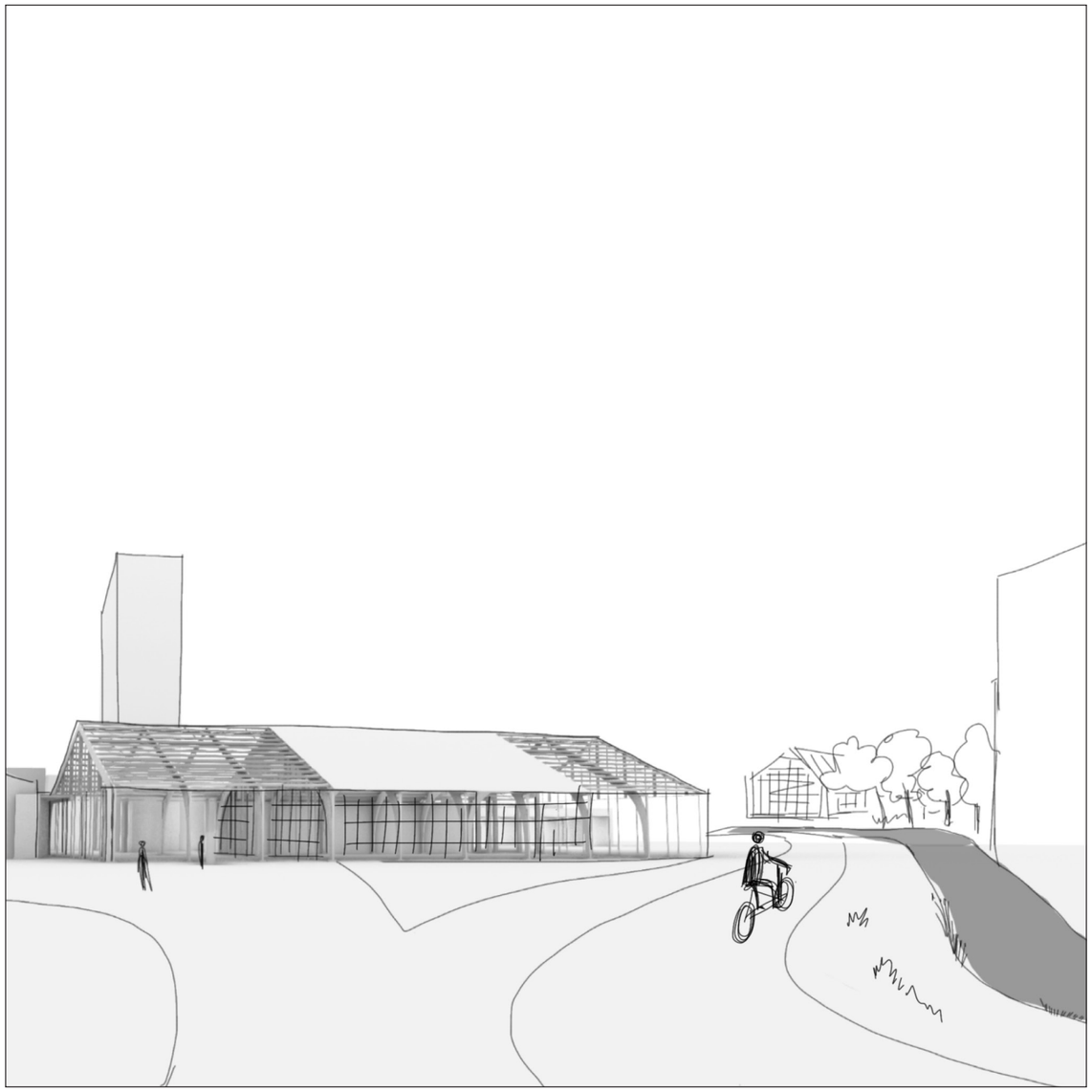
House Richter

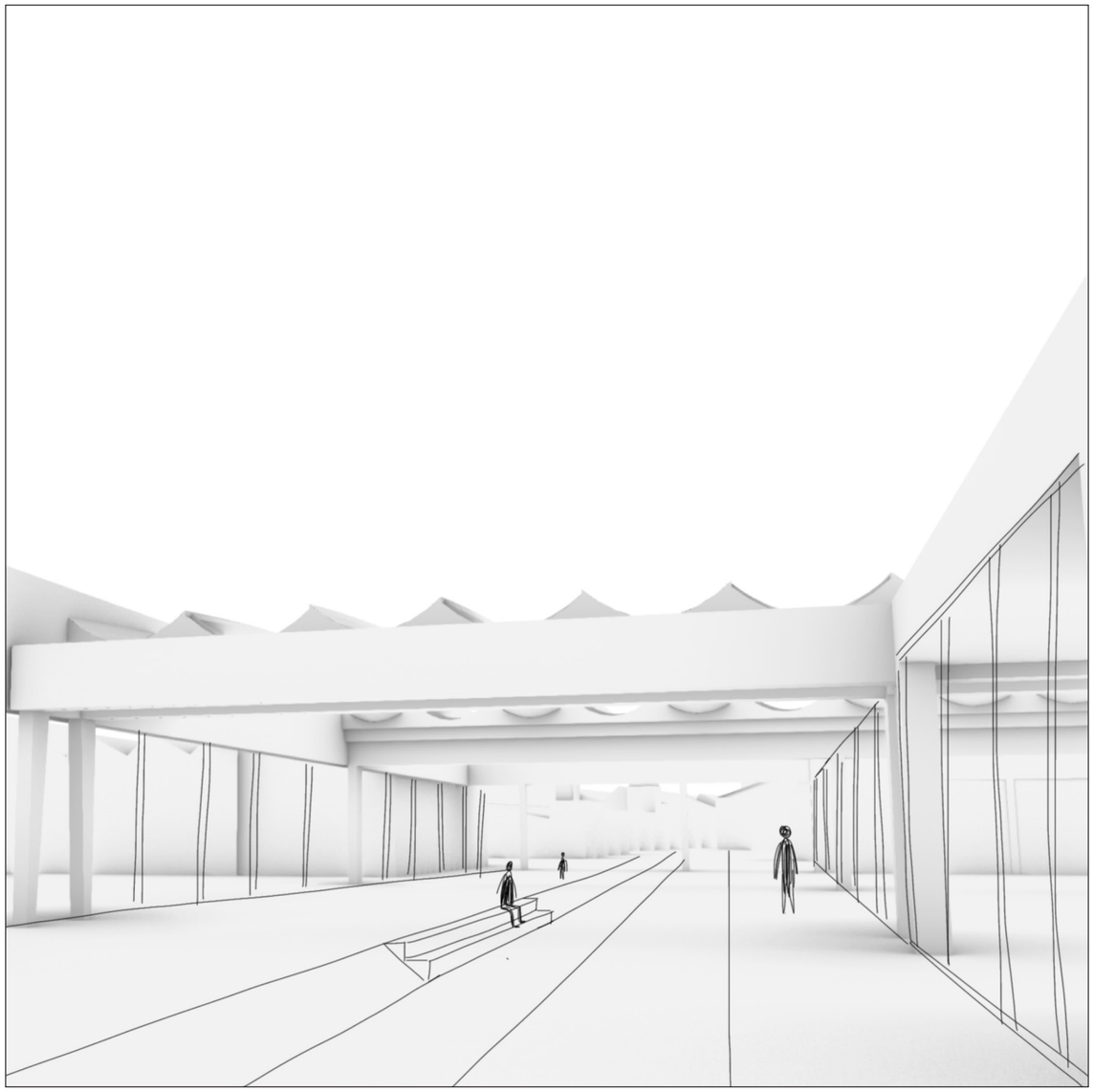
MASTERPLAN


'GARENLOODS'
'HET PLEIN'
'DE ZAAL'
'HET MUSEUM'
'WEVERIJ'
'MAGAZIJN'
'DE TOREN'

MASTERPLAN

MASTERPLAN

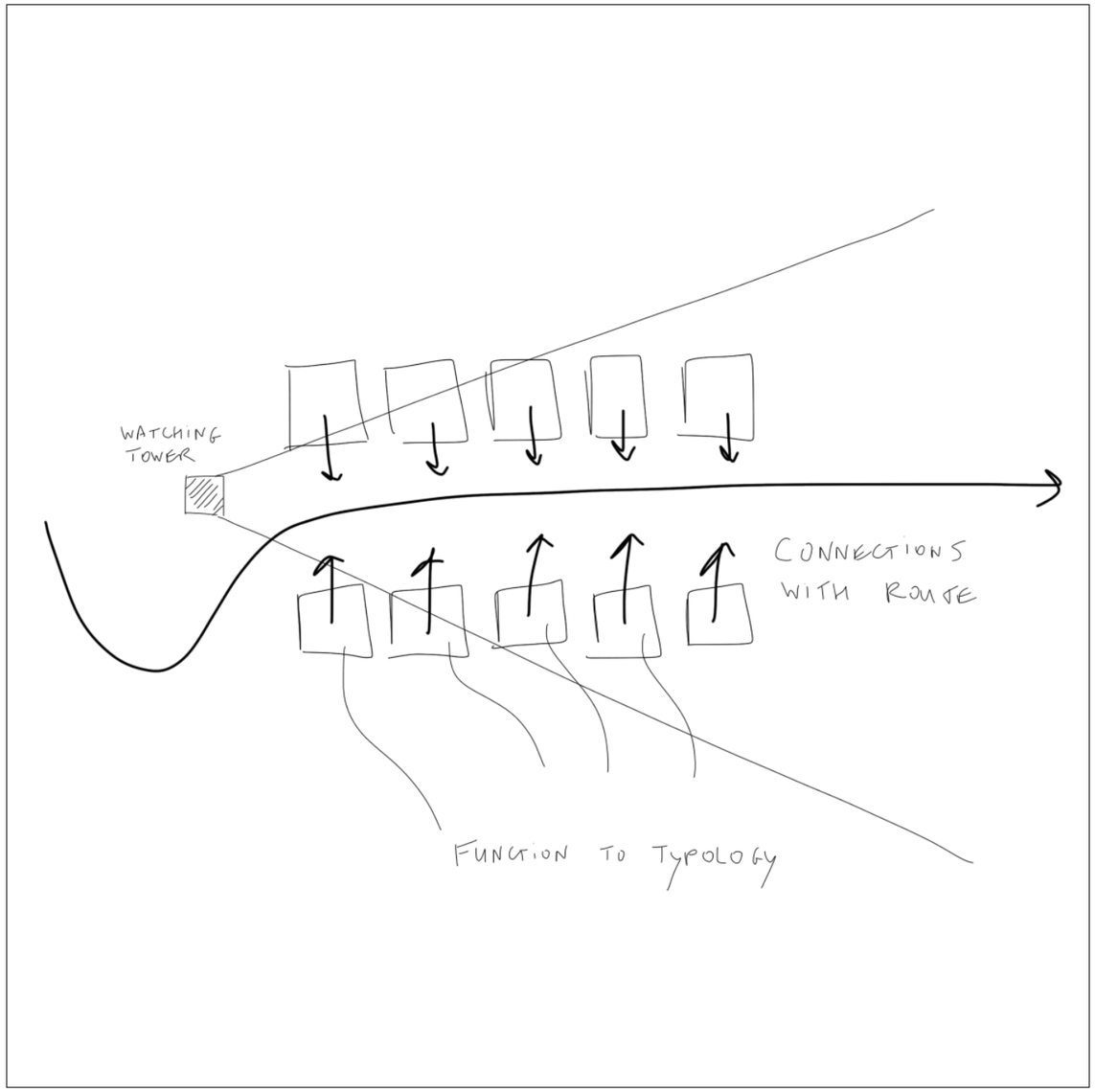




WEEKLY DRAWING

25-11-2019

MASTERPLAN



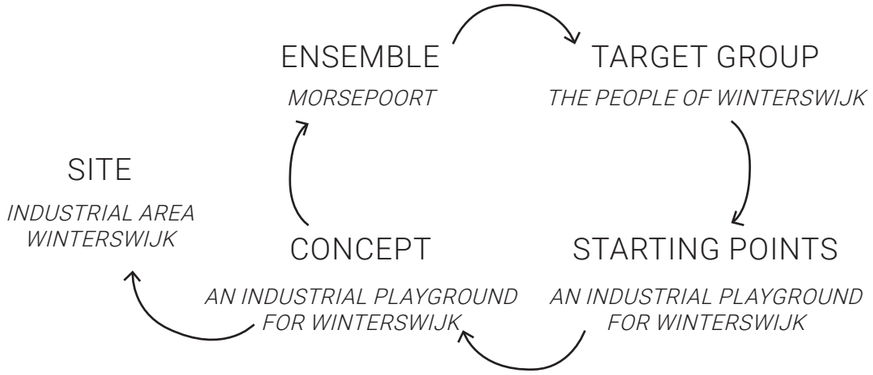
DESIGN SCHEME

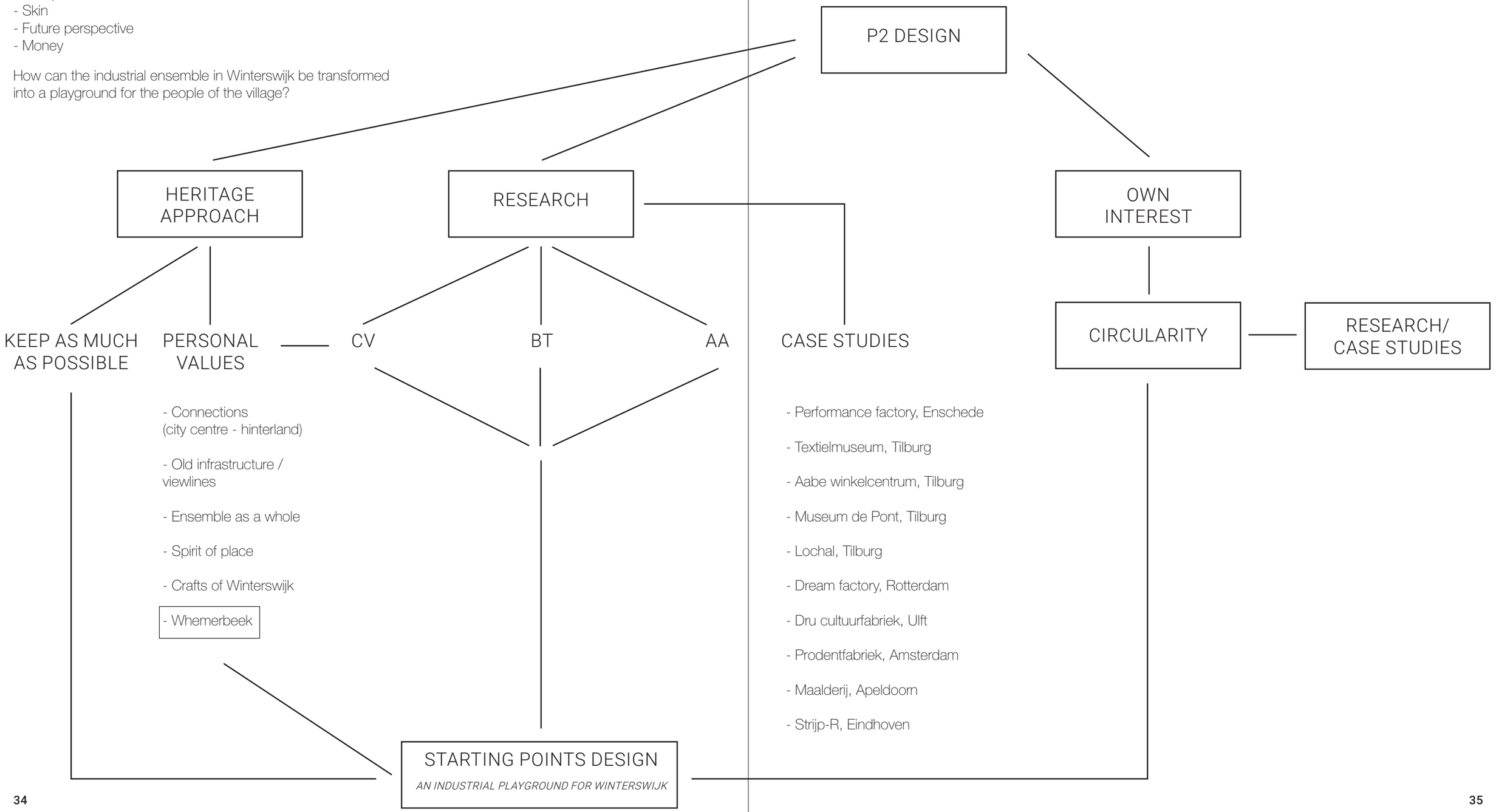
RESEARCH QUESTION

What are the preconditions for a former industrial area to be redeveloped (organically)?

"CITY AS A HULL"
- Start
- Function
- Floorplan
- Skin
- Future perspective
- Money

How can the industrial ensemble in Winterswijk be transformed into a playground for the people of the village?





PROGRAMME

WOOD MANUFACTURING IN WINTERSWIJK

Textile manufacturing, which began with the craftmanship of the farmers around Winterswijk, has alwasy been an important industry for Winterswijk. It used to be a real proud of the village and all inhabitants used to feel very much connected to the industry and the industrial area. Now only Gaudium is left and the area has lost it's status of showpiece for the village. Although, this situation also leaves possibilities to bring back the pride of the area.

What entrepreneurs and small businesses should be suitable for the area?

Craftmanship
- Maatwerk interieurbouwers
- Meubelmakers

Creative industry
- Ateliers

What material could be suitable for the area?

Back in the days, wood was a very important and respected material for Winterswijk. --> Scholteboeren.
Now it is seen as a very sustainable material. There is also a trend going on, with people wanting to go back to recognisable products from their own region. Therefore wood is a suitable material to be the base of redevelopment of the industrial areal.

Existing initiatives with wood in Winterswijk
- Arco furniture (Project Local Wood - Stichting Geldersch Landschap en Kasteelen)
- Boomstamtafel Winterswijk
- De Holtplas Houthandel

Education
- Graafschap College has woodworking / carpentry education

The design will be a place where the old and the new craftmanship of Winterswijk is combined:

> Textile
> Agriculture

> Wood

Sources:

https://www.tubantia.nl/achterhoek/design-meubelfabriek-arco-uit-winterswijk-wil-project-local-wood-wereldwijd-uitrollen~a10658a7/

https://deholtplas.nl/de-holtplas/

https://www.dearchitect.nl/interieur/nieuws/2015/9/meubels-van-lokaal-hout-10198686

https://boomstamtafel-winterswijk.nl/over/

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https://graafschapcollege.nl/

https://erfgoedstem.nl/per-2020-vernieuwde-opleiding-hout-restauratietechniek-op-mbo-3-niveau-in-gelderland/

CONCEPT

TITLE OF THE GRADUATION PROJECT

Timber Town: An inclusive playground for Winterswijk, built for and out of wood

THE POSED PROBLEM

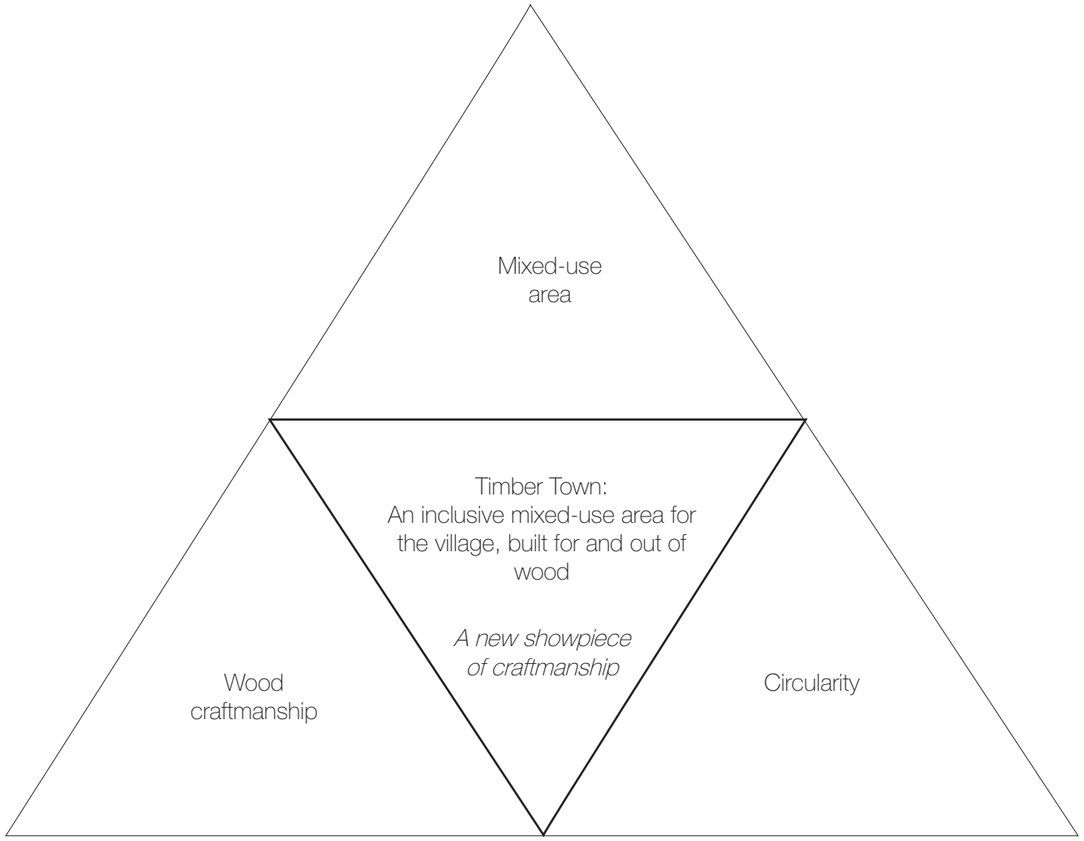
Textile manufacturing, which began with the craftmanship of the farmers around Winterswijk, has been an important driver for the development of the village and its inhabitants. In the late 19th Century the craft was taken to the industry and soon grew out to the pride of the village.
The project is a building ensemble within an industrial area, close to the village centre. Regardless of the textile industry fulfilling the core function of Winterswijk's prosperity in the past, part of the area currently lays unused and deteriorated: only Gaudium is still functioning as a textile factory. Despite the presence of this factory, the industrial area has lost its status of showpiece for the village and the inhabitants do not feel connected to the area anymore.

RESEARCH QUESTION

What are the preconditions for a former industrial area in a region with demographic decline to become the new pride of the village?

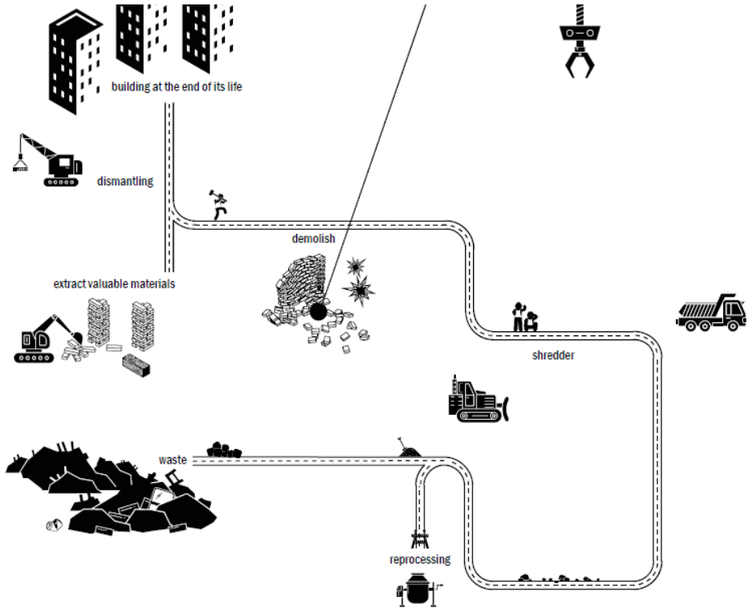
DESIGN QUESTION

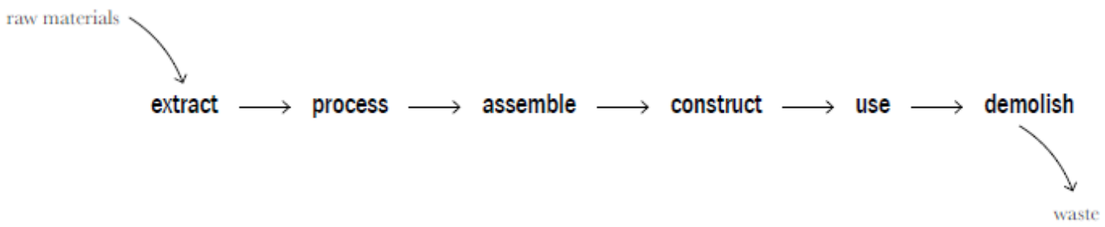
How to transform the industrial ensemble in Winterswijk into an inclusive mixed-use area, built for and out of wood?

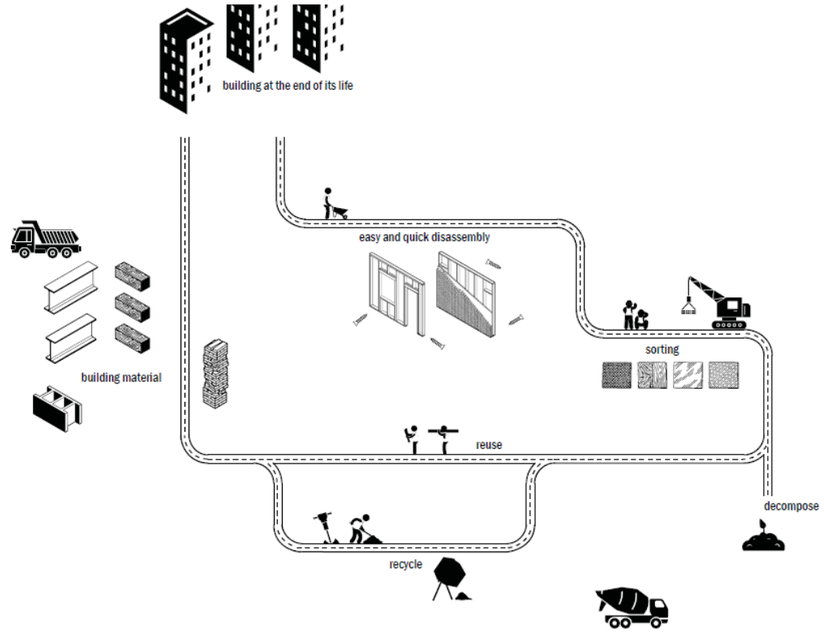


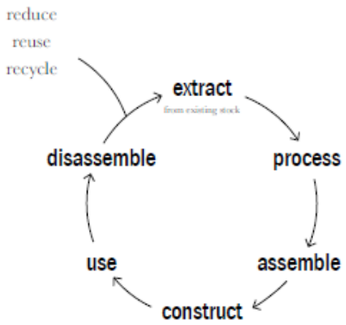
DESIGN

CIRCULARITY









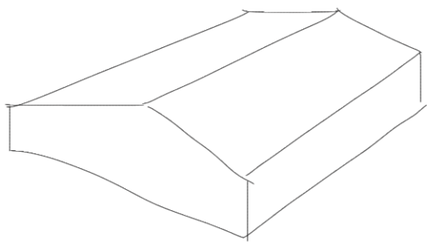
Images by Ditte Gerding

DESIGN

CIRCULARITY

Modular building items:

- Partition walls
- Curtain walls
- Frame
- Floors
- Units



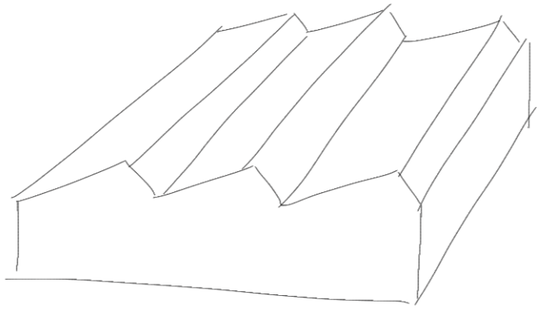
Partition walls

Curtain walls

Frame (flexible)

Walls

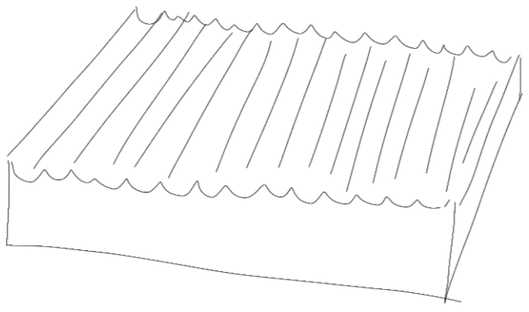
Floors



Interior elements

Units (shop)

Unit (exhibition space)

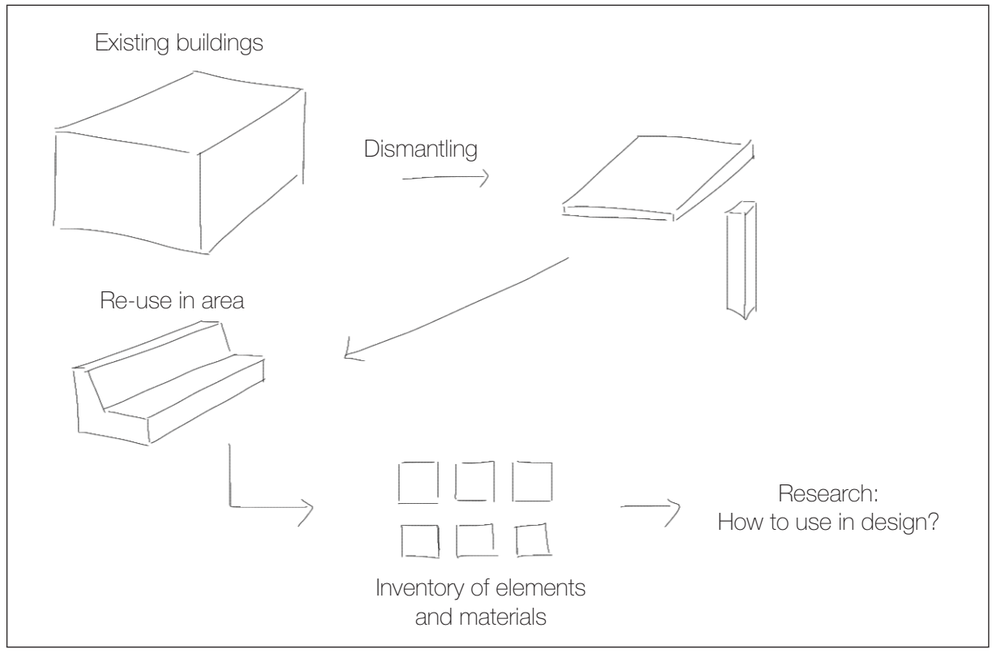


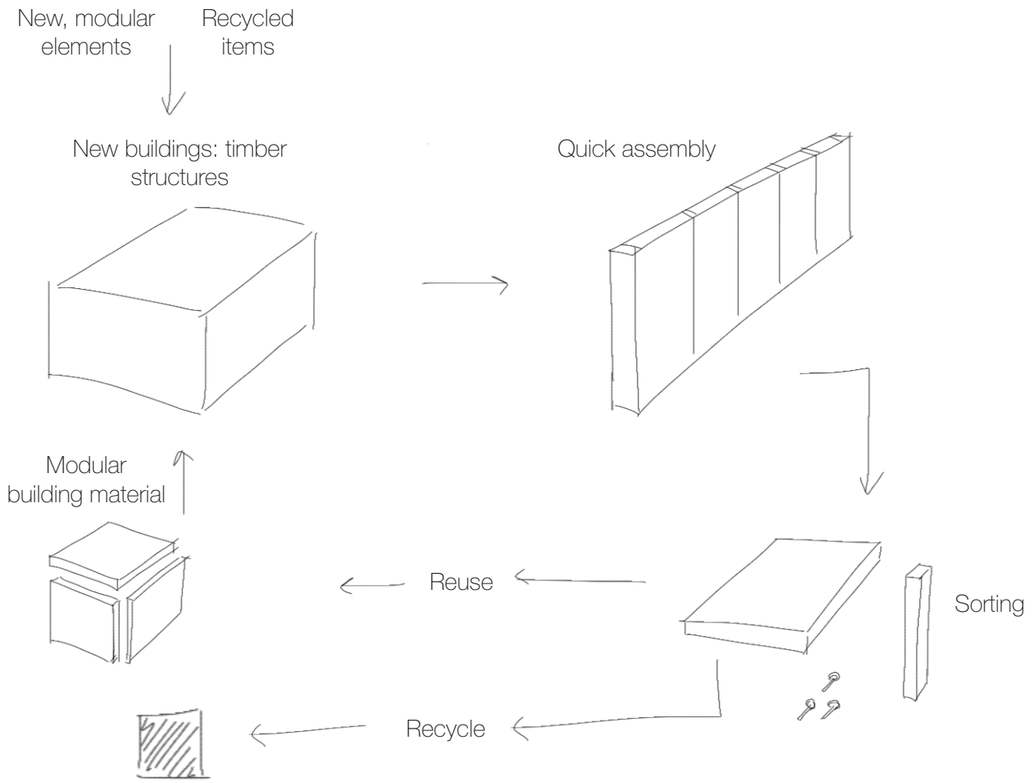
Partition walls

Shelves

Units (offices)

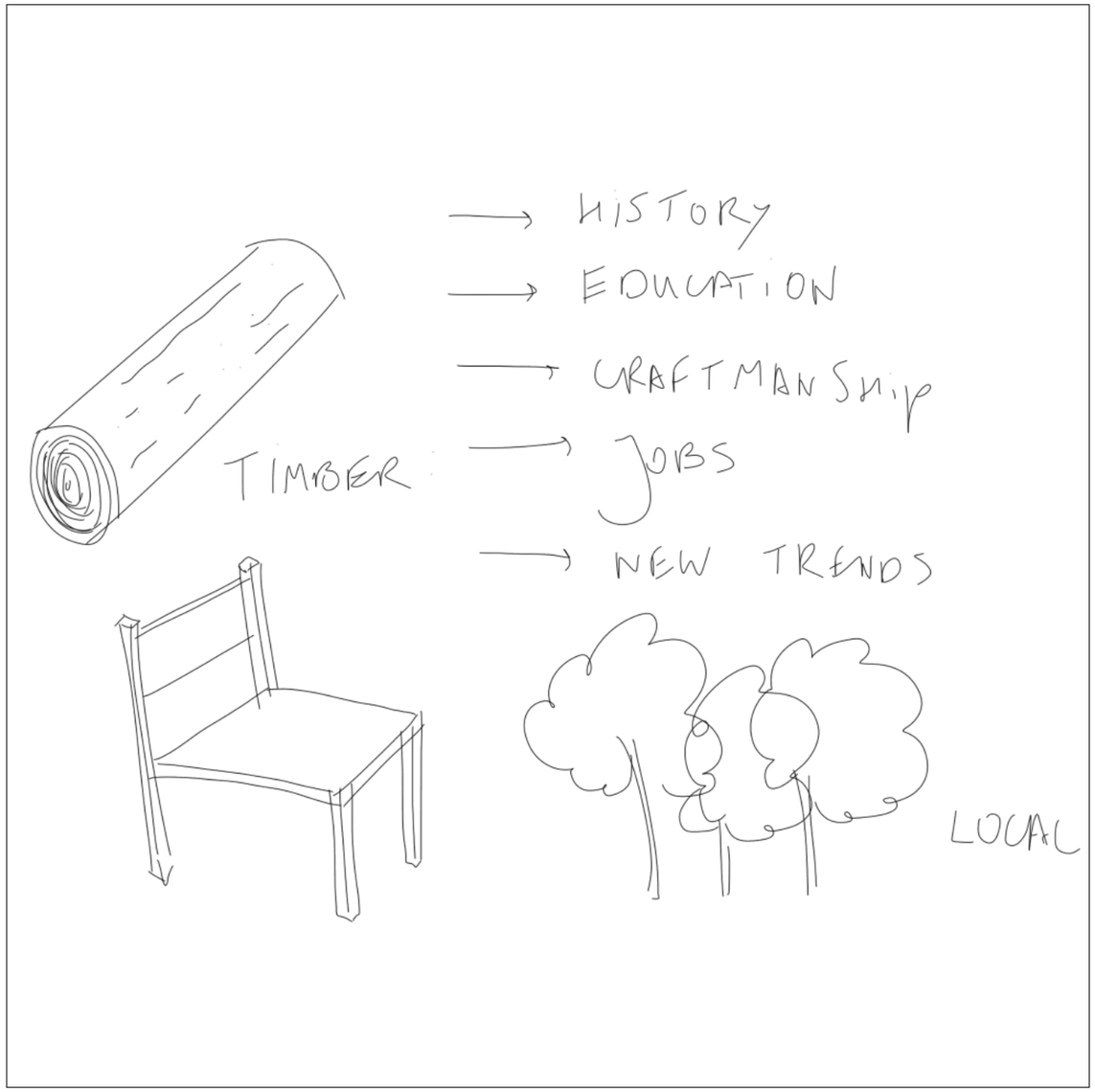
Frame (flexible)





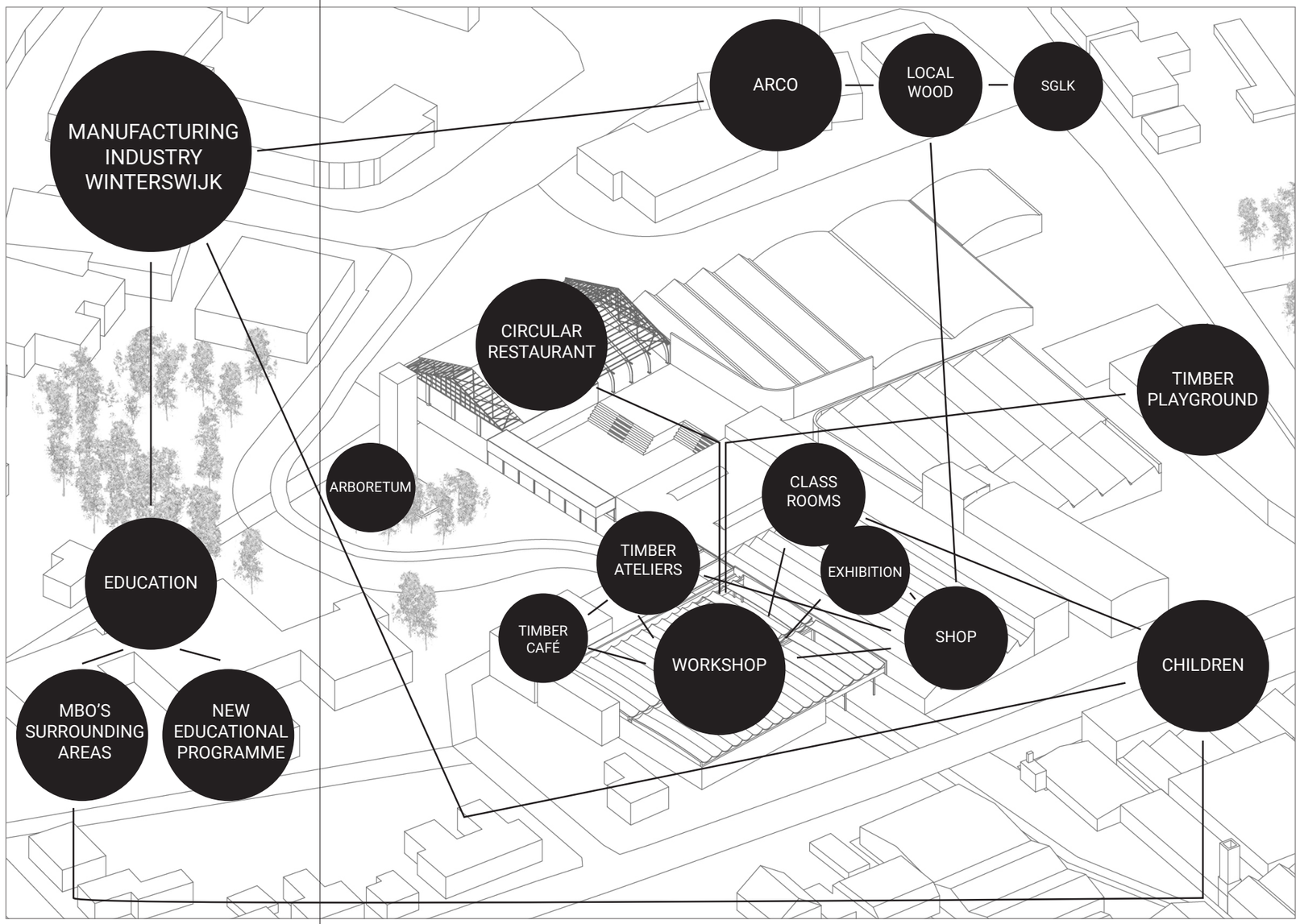
WEEKLY DRAWING

TIMBER



TIMBER

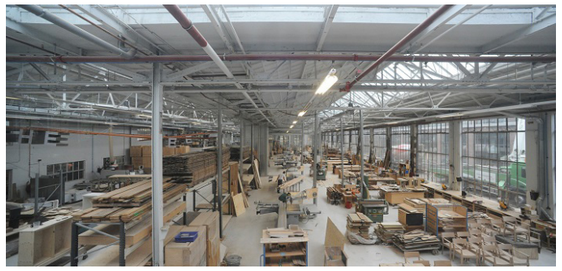
TIMBER NETWORK

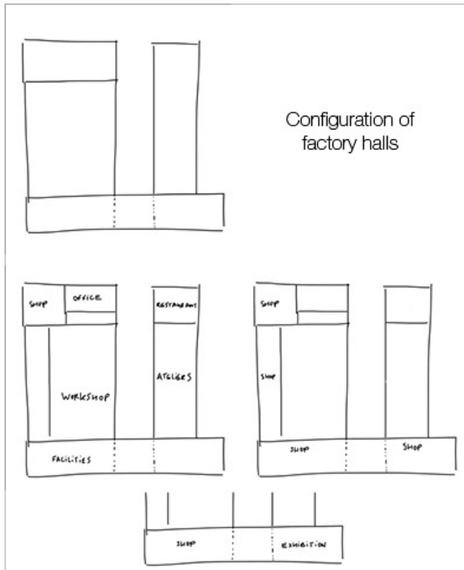


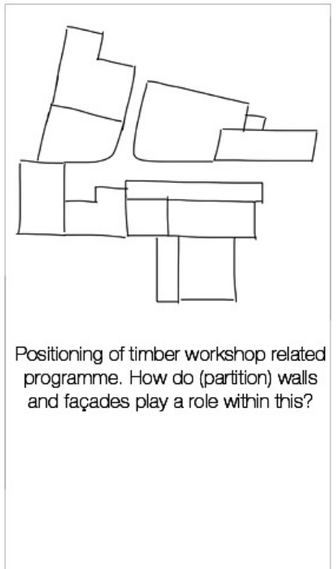
CASE STUDY

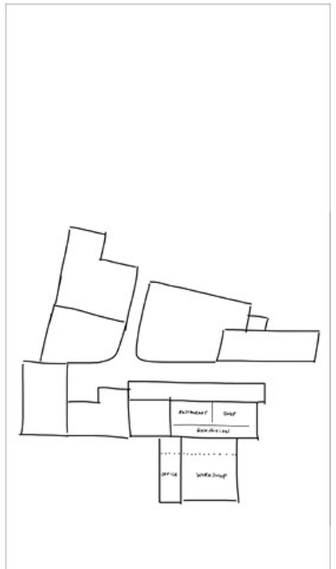
STRIJP-R

- A former industrial building complex where Piet Hein Eek has his timber workshop for producing his own designs, a showroom, exhibition spaces, a shop, a restaurant and some ateliers. Everything is very light and shows transparancy.
- The former workshop is huge with dimensions of about 2500 m2 and it is visible from almost all spaces.
- Other things: people just walk their dog in the area, the workshop holds big installations, the proximity of housing around the complex makes it human scale like, an organized chaos which is in between a private and public space.









STRIJP-R

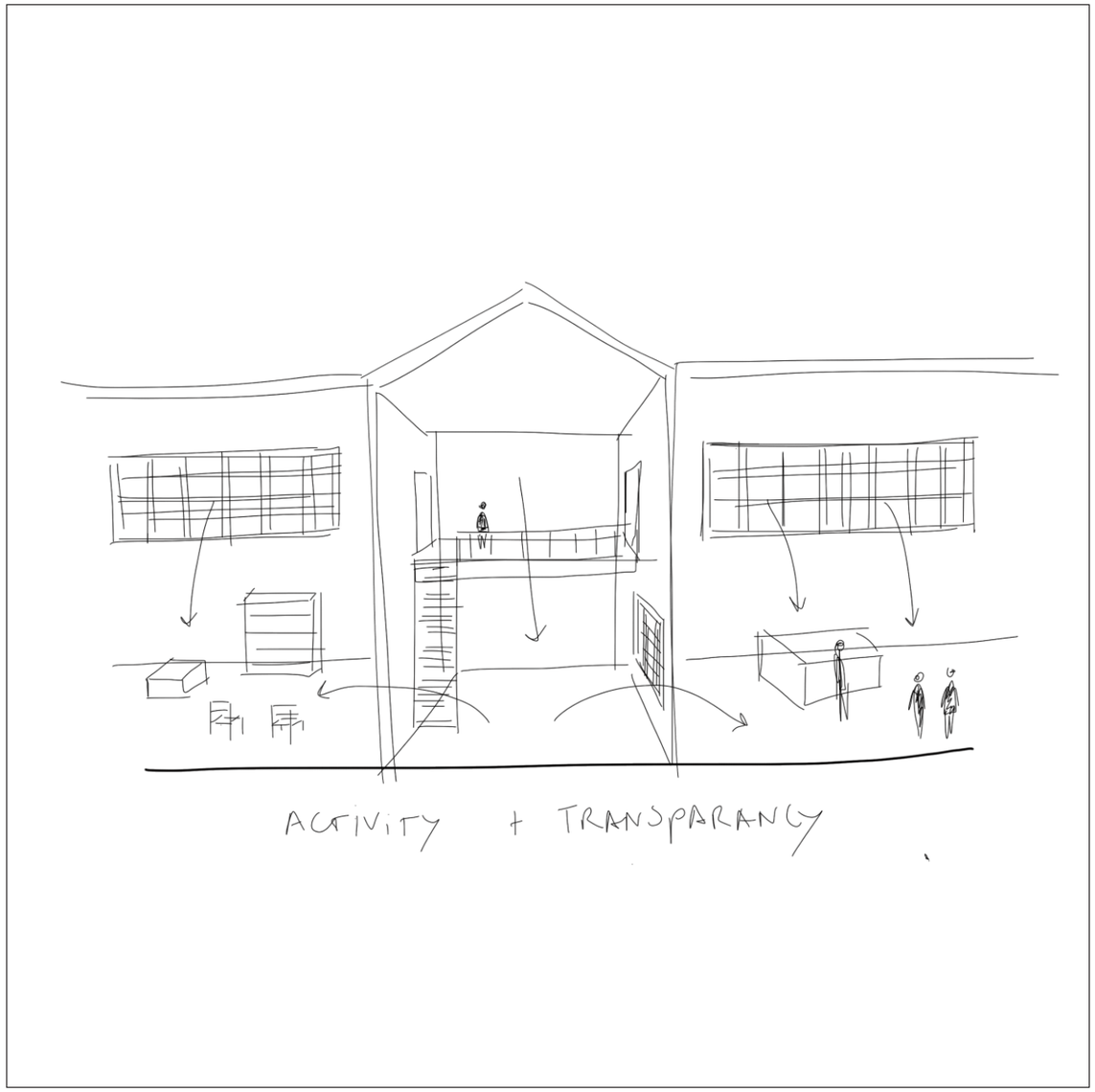
WINTERSWIJK

DESIGN OPTIONS

WEEKLY DRAWING

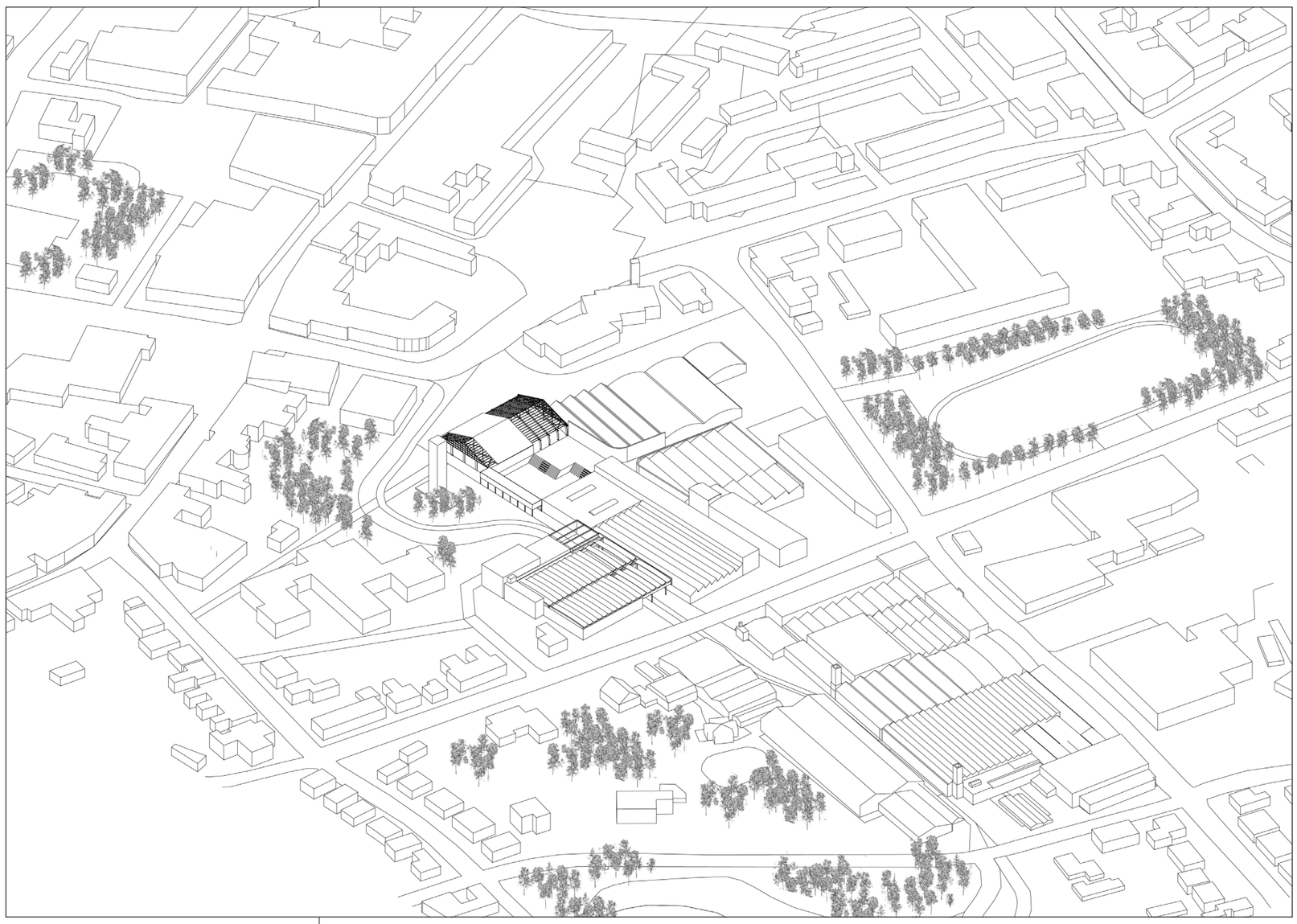
09-12-2019

TIMBER



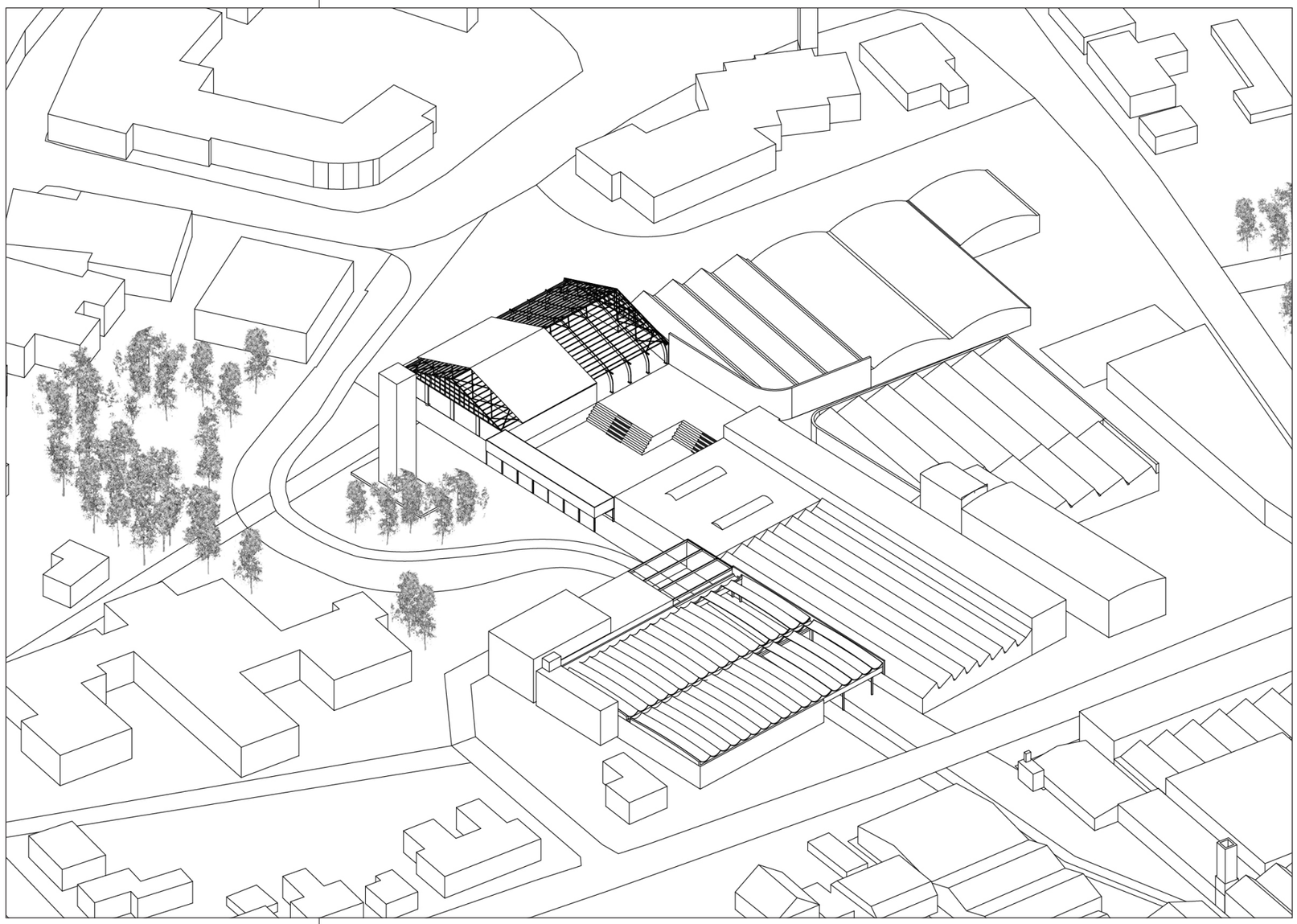
MASTERPLAN

SURROUNDINGS:



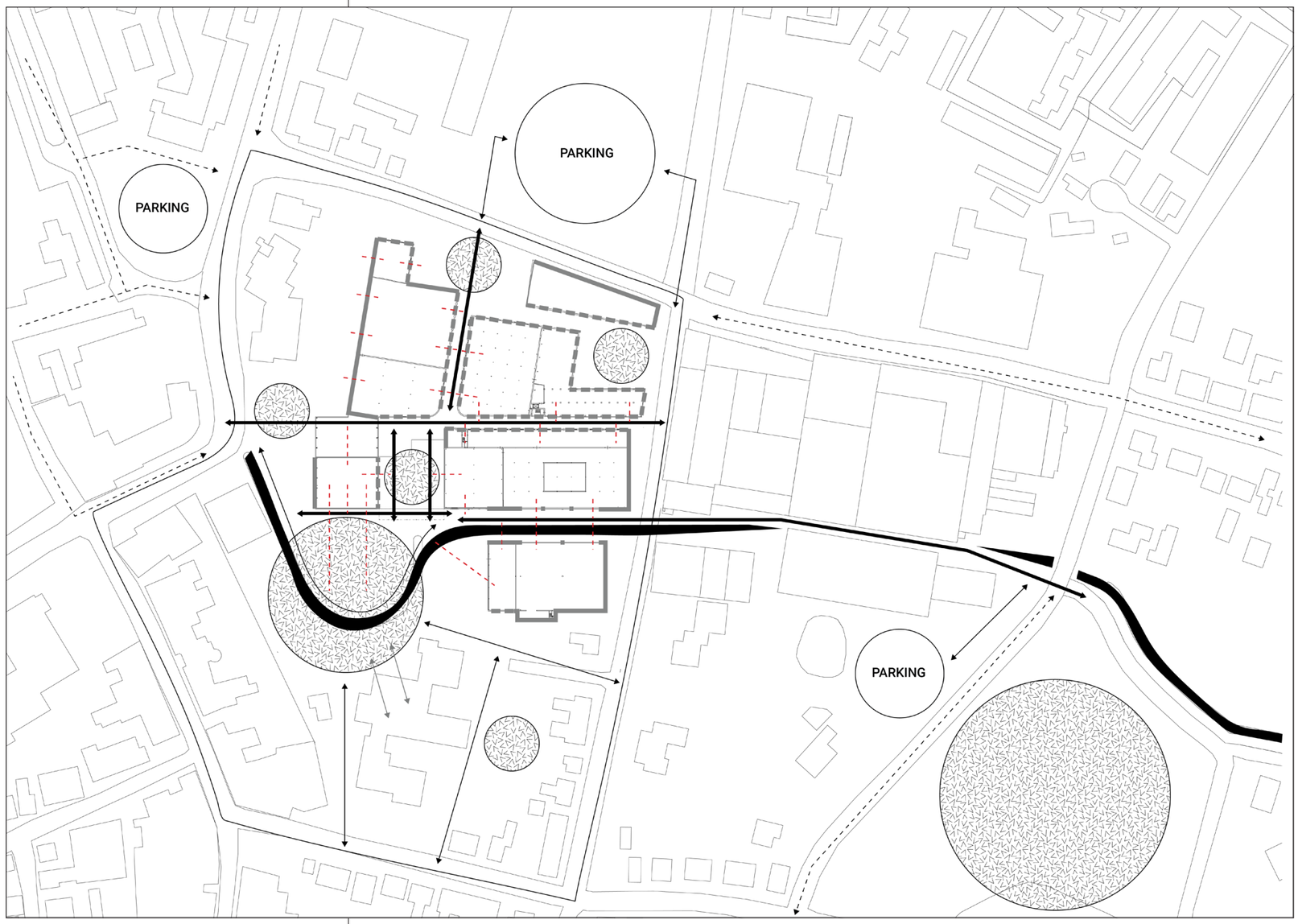
MASTERPLAN

SITE



PRELIMINARY DESIGN

LAYERS, CONNECTIONS

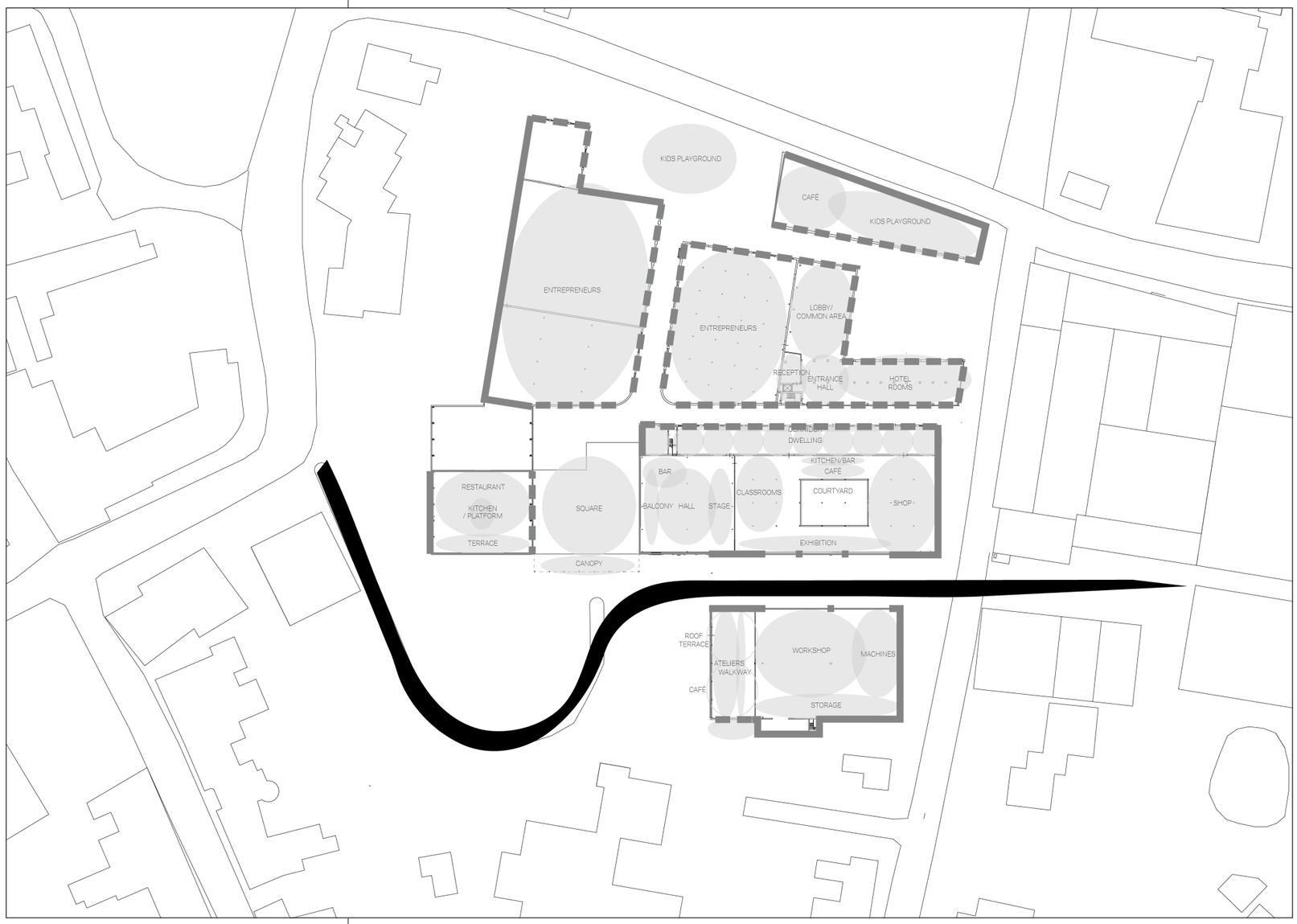


PRELIMINARY DESIGN

LAYERS, STRUCTURE

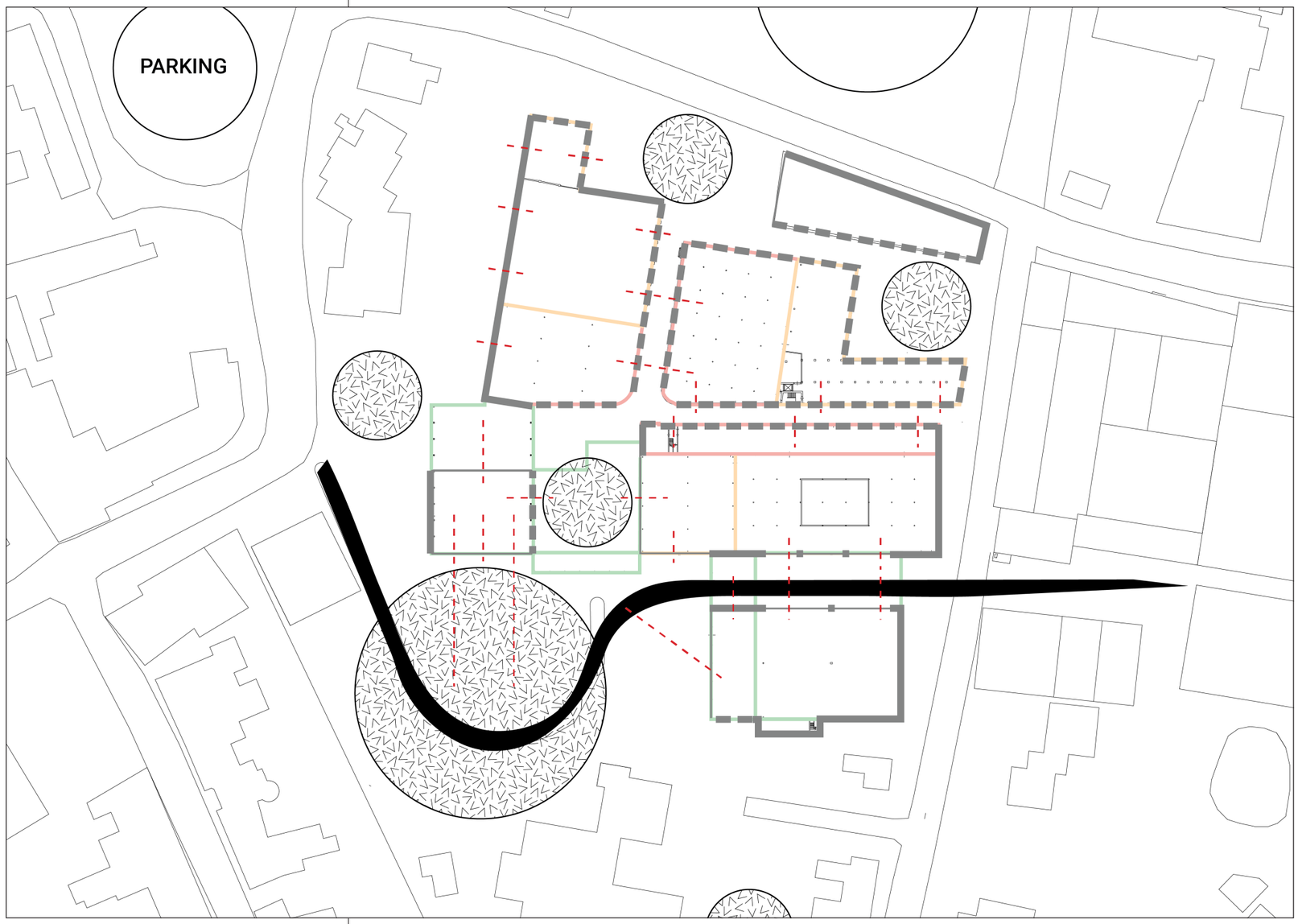
PRELIMINARY DESIGN

LAYERS, PROGRAMME



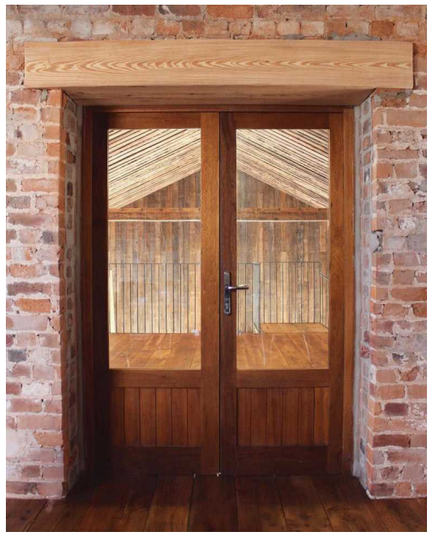
PRELIMINARY DESIGN

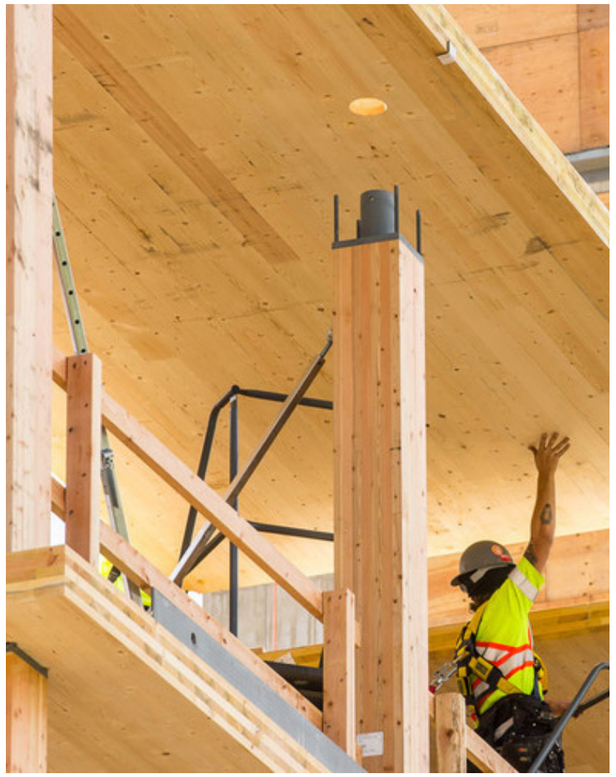
LAYERS, CULTURAL VALUE

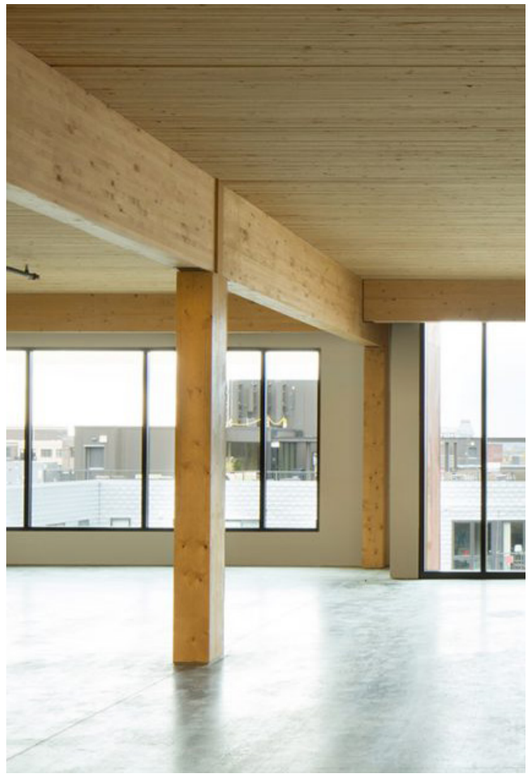


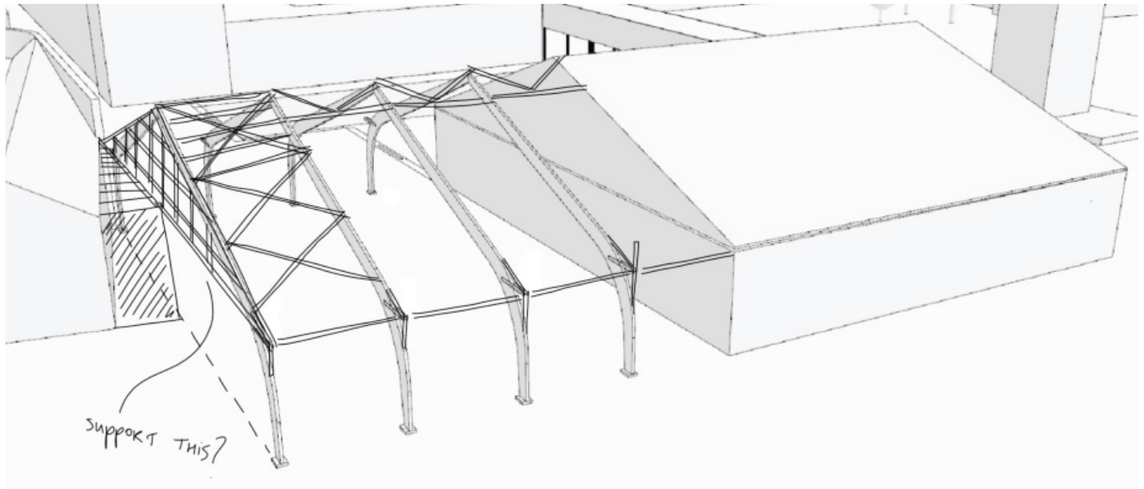
BUILDING TECHNOLOGY

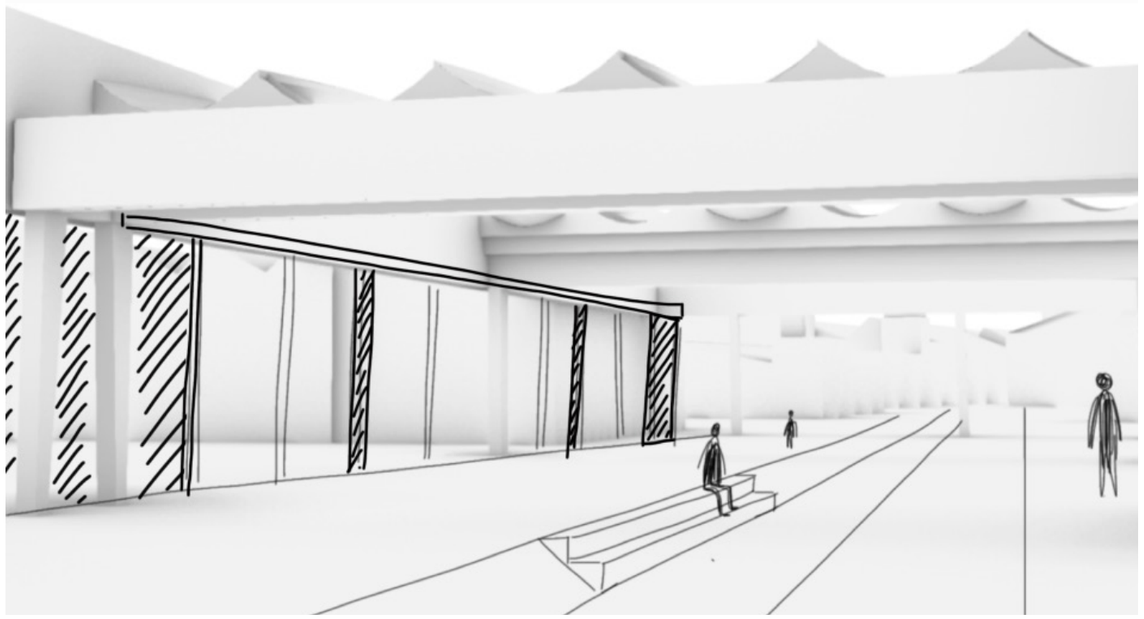
EXISTING STRUCTURES

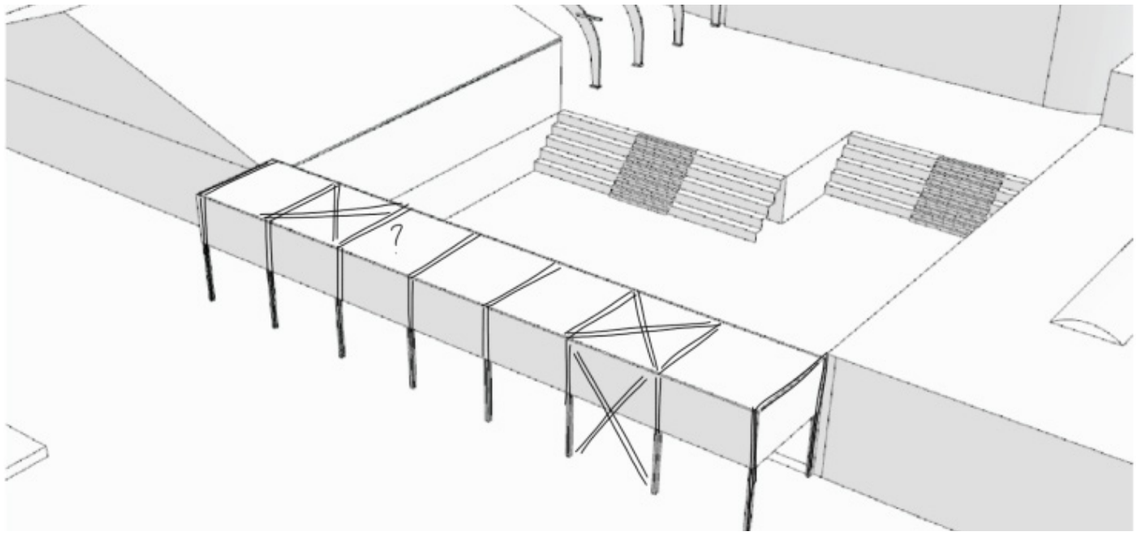






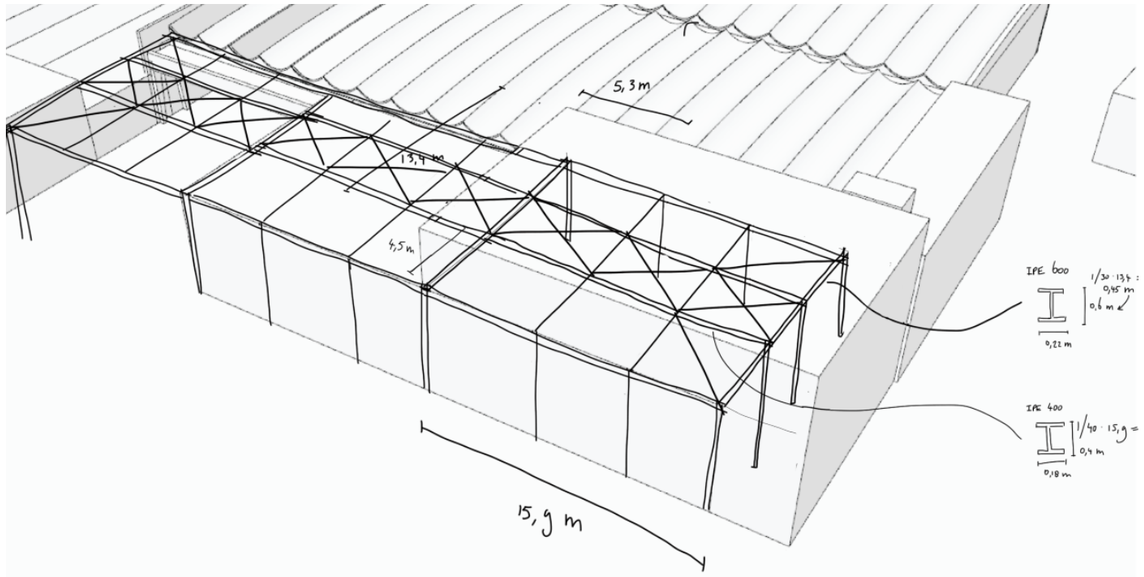


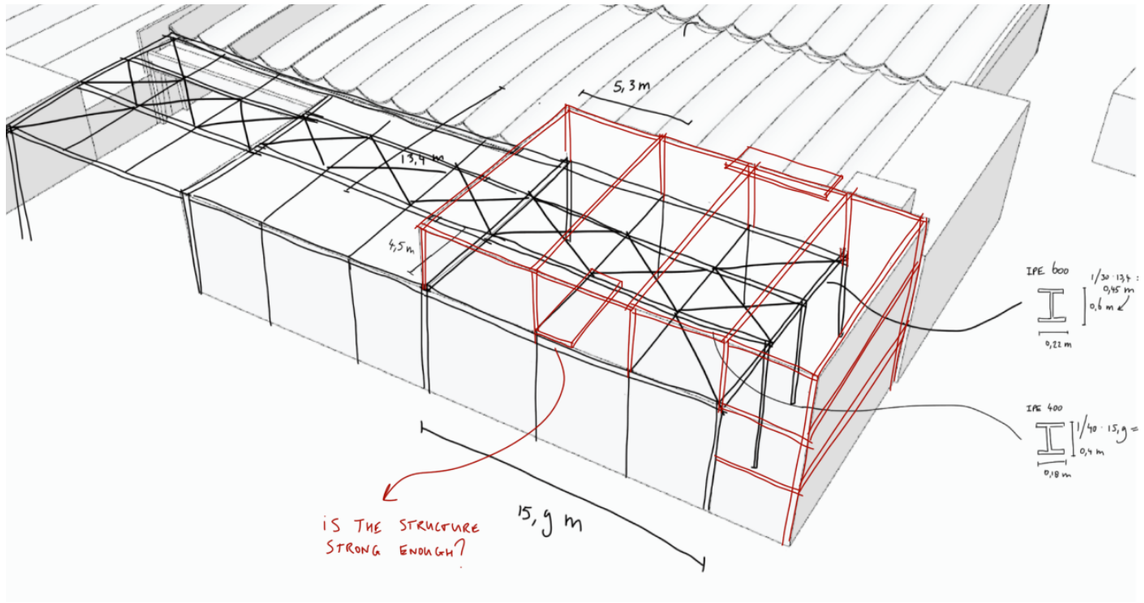


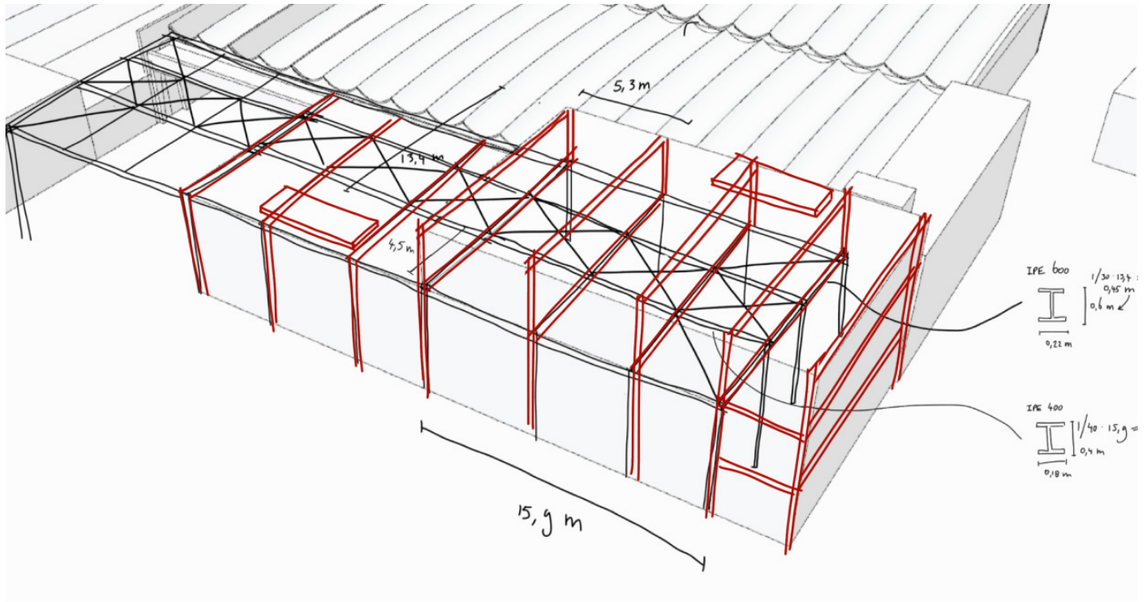


BUILDING TECHNOLOGY

TIMBER STRUCTURE:



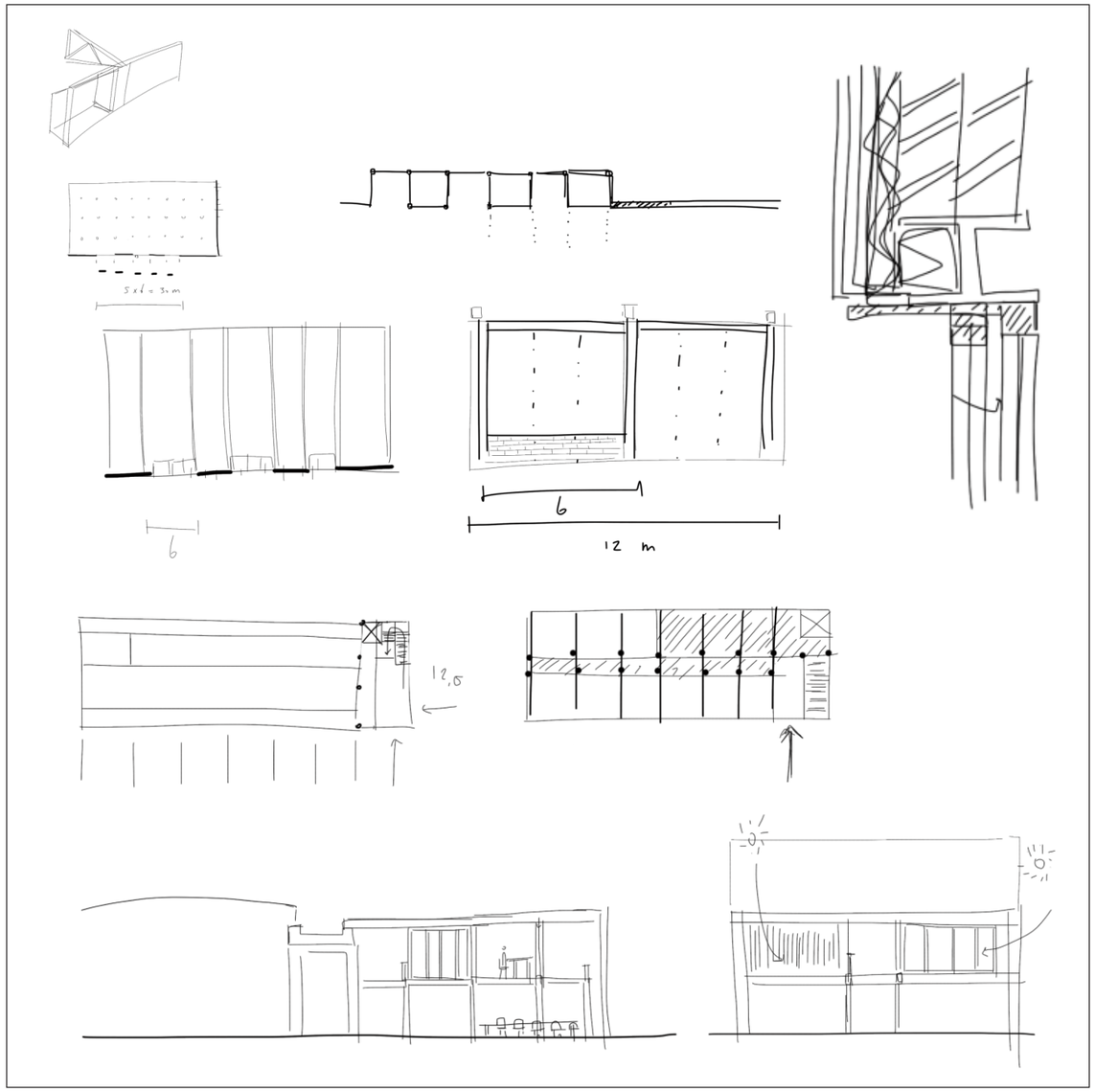




WEEKLY DRAWING

17-12-2019

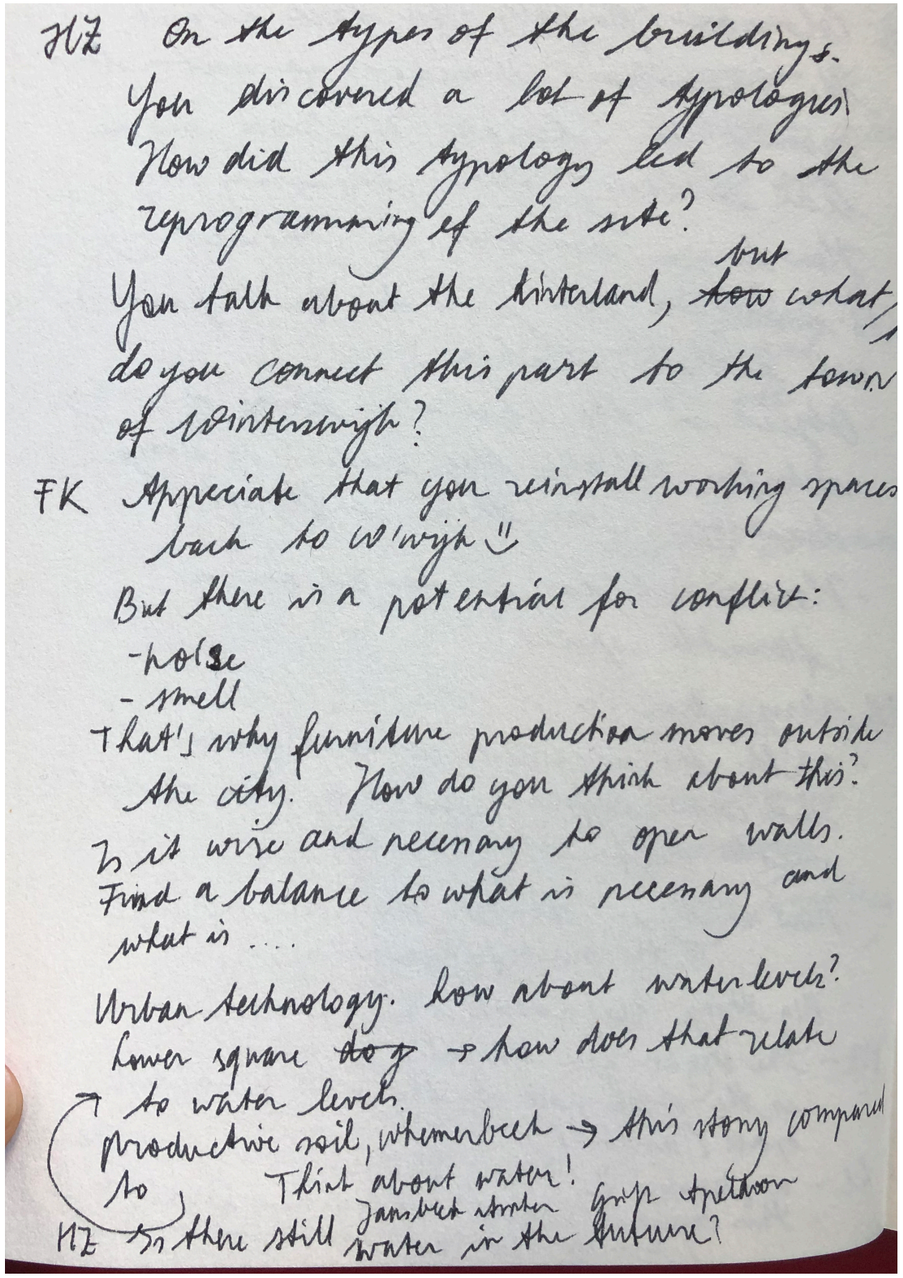
PRELIMINARY DESIGN



P2 PRESENTATION

13-01-2019

HIELKJE:



FEEDBACK:

Het project is op een goed niveau. Het is een complexe opgave over een grootgebied met veel gebouwen. Bepaal op hoofdlijnen wat de uitgangspunten zijn (op basis van de voorstudies zoals betekenis, waarden, typologiën, etc) voor het ontwerp. Maak dan een keuze welk onderdeel je eerst verder gaat uitwerken. Daarna volgt de rest. Stap voor stap opbouwen en uitwerken. Realiseer je welke impact bepaalde ingrepen hebben op de omgeving. Bepaal je positie als architect, waarbij het belangrijk is hoe het nieuwe zich verhoudt tot het bestaande. Eerst op onderdelen focussen en dan het geheel oppakken. Zoek voorbeelden (ruimtelijk, functioneel, architectonische uitwerking), analyseer ze en leer daar van.

Denk aan conflicten die je mogelijk zelf organiseert in je programma voor het gebied: b.v. geluid en geur overlast.

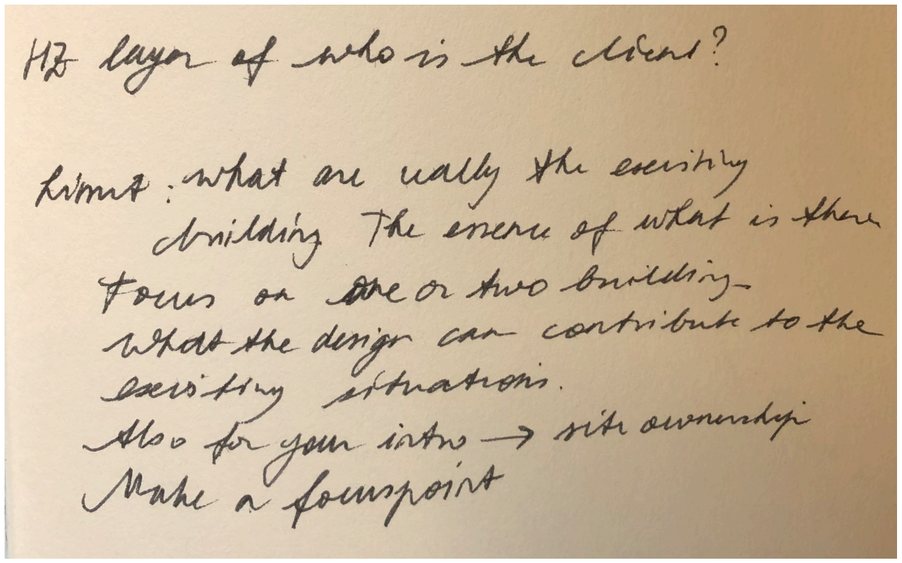
Wat is de rol van het grond- regen- beek- water niveau in je plan?

Vraag van Ab Straub: Wie is je opdrachtgever?

- Exploration: openness, discovering and investigation, analysis and testing

- Spatial aspects: such as experiencing space, by circulation, composition, light, texture, colour, shape and mass

- Material and technical aspects: such as material, detailing, physics, structure, construction, and climate design

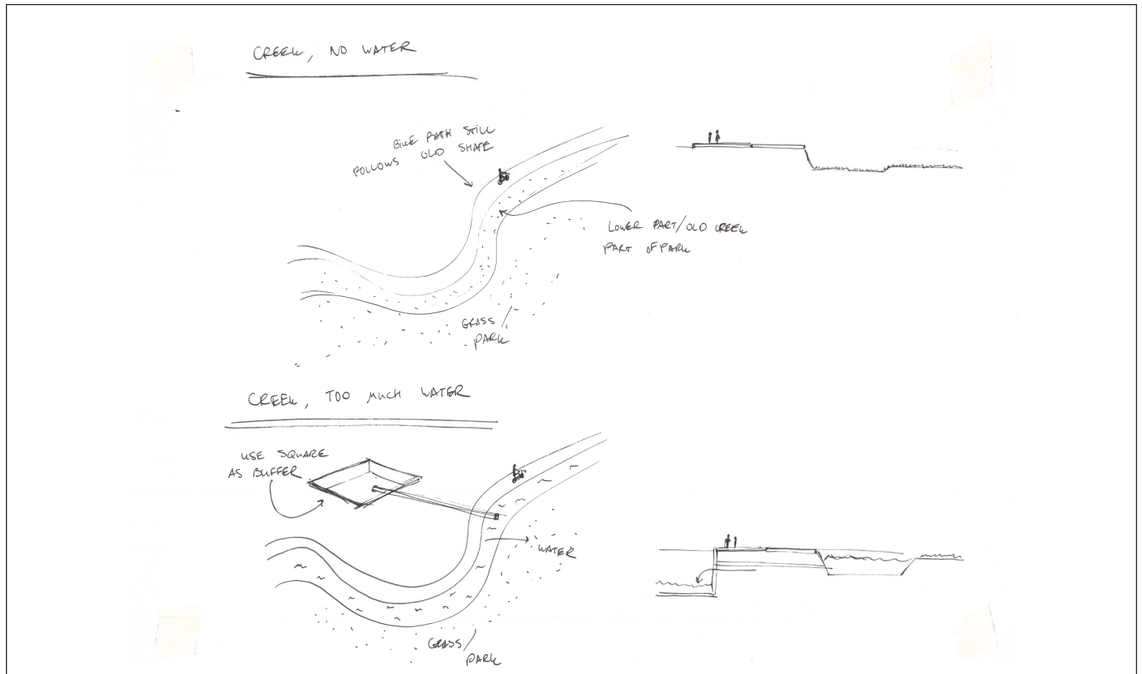


EXPLORATION

AFTER P2 RESEARCH:

- Wat zijn de uitgangspunten? Op basis van voorstudies zoals betekenis, waarden, typologiën
- Welk onderdeel ga je verder uitwerken?
- Welke impact hebben bepaalde ingrepen op de omgeving?
- Wat is je positie als architect? Hoe verhoudt het nieuwe zich tot het bestaande?
- Zoek voorbeelden: ruimtelijk, functioneel, architectonische uitwerking

- Geluid en geuroverlast?
- Wat is de rol van het grond- regen- eek water niveau in je plan?

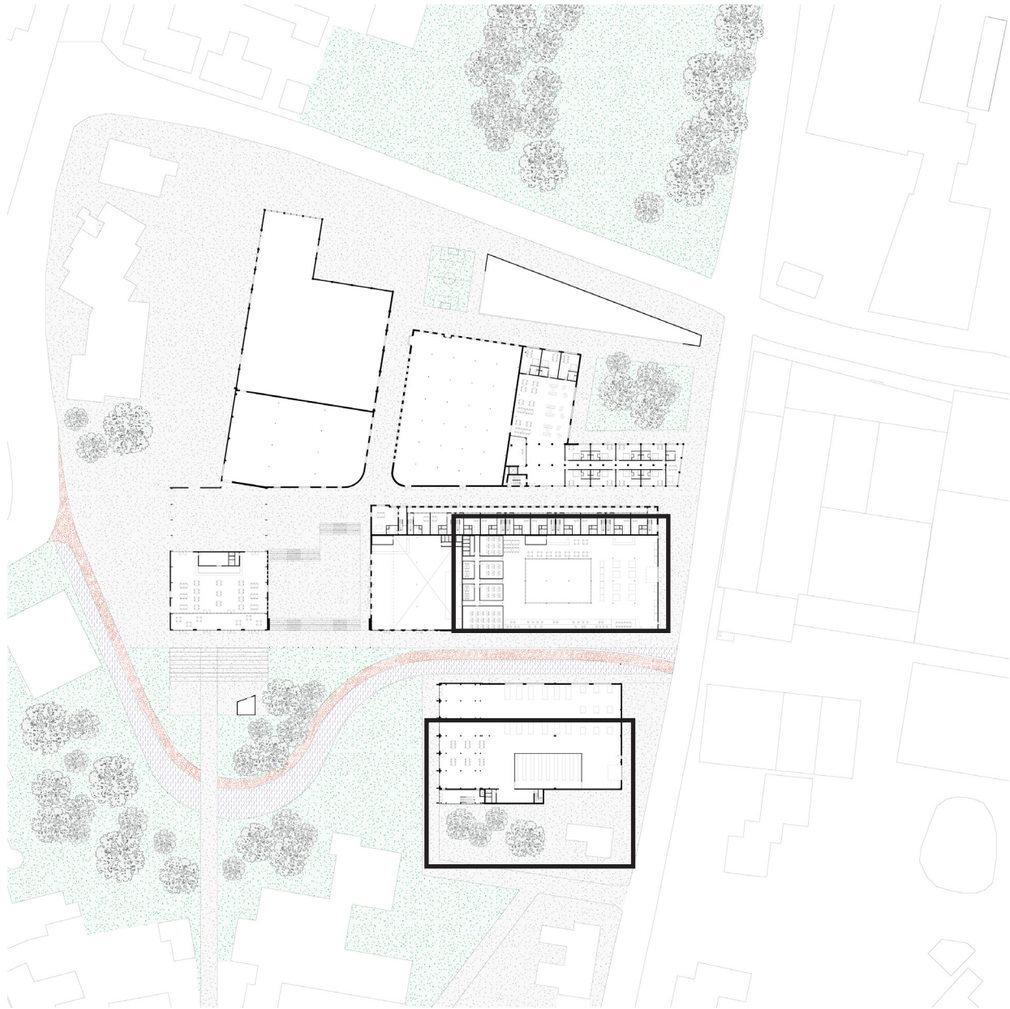


HERITAGE BASED DESIGN

Designed past, designed presence, non-designed presence
Designed presence:
- Certain features of the existing architecture are used in a new way. The is a connection between the old and the new, but the new design is also autonomous.
- To carefully respect the heritage, but to keep additions recognisable as a new time layer
- The Neues Museum in Berlin. the building was completed, but not restored. It forms one whole, but tells three stories: of an ancient monument, of the destruction and of the new age.

FOCUS BUILDINGS:

- The creek is important. Both buildings have a close relation with the creek
- The buildings are the heart of the programme, where almost everything is related to the timber workshop.
- Looking at the typologies in the Morsepoort, the chosen typologies are interesting. The HP-shell roof is rare in itself and has an interesting but solid structure. The chosen shed-roof structure could appear as not to be rare, but is kind of special because it is the only one which is present in this particular column beam combination in the ensemble in Winterswijk.



EXPLORATION

(HERITAGE) POSITION AS AN ARCHITECT

HERITAGE

Heritage based design
Designed past, designed presence, non-designed presence
Designed presence:
- Certain features of the existing architecture are used in a new way. The is a connection between the old and the new, but the new design is also autonomous.
- To carefully respect the heritage, but to keep additions recognisable as a new time layer
- The Neues Museum in Berlin. the building was completed, but not restored. It forms one whole, but tells three stories: of an ancient monument, of the destruction and of the new age.

- Blending (Jo Coenen)
BK A.VII.1203a

Adaptable architecture: theory and practice
- Robert Schmidt
BK A.XIII.468

JAPANESE TIMBER ARCHITECTURE

Kengo Kuma: materials, structures, details
- Kengo Kuma
BK W.II.Kuma. 3

INDUSTRIAL HERITAGE

Adaptive Re-use, Liliane Wong
Adaptation: Adaptation means the process(es) of modifying a place for a compatible use while retaining its cultural heritage value. Adaptation processes include alteration and addition.
ICOMOS NEW ZEALAND, 2010
Alteration: Change in formation, that is removal of partition walls to enlarge a space within the fabric of a building, or conversely the introduction of partition walls to subdivide a space into smaller units.
PAUL WATSON, 2008

Industrial Heritage re-tooled
Industrial Heritage sites in transformation

TIMBER

Wood architecture
- Ruth Slavid
BK U.IV.172
Spaces for innovation
- Kursty Groves
VGB216

(HERITAGE) POSITION AS AN ARCHITECT

-Liliane Wong, Adaptive Re-Use

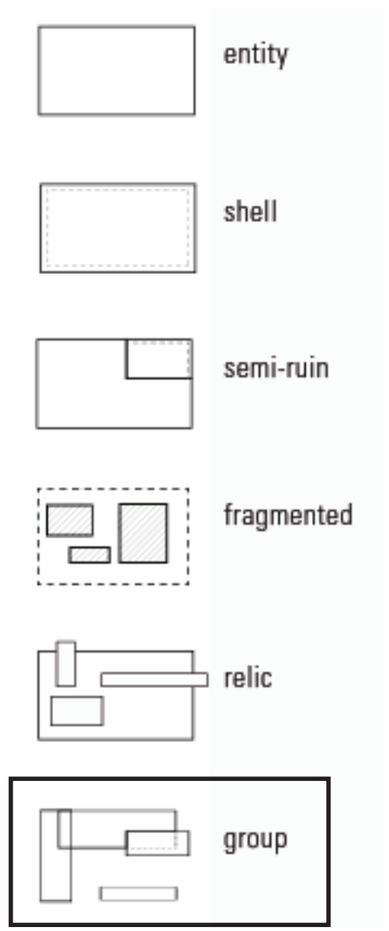


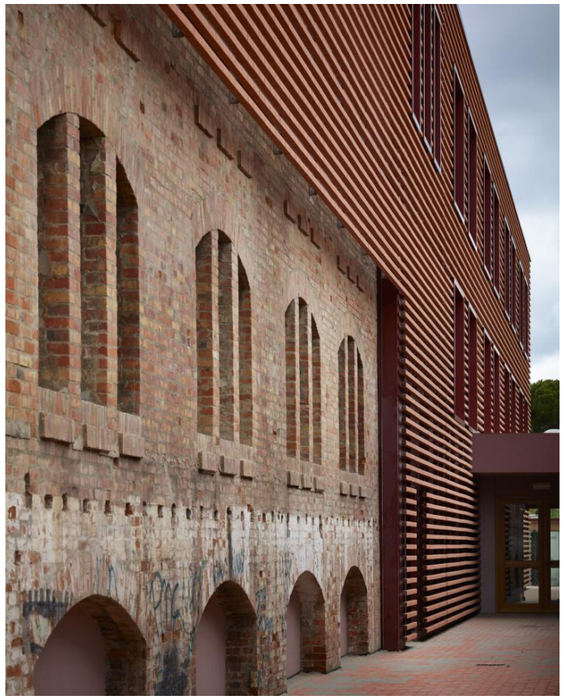
FIG.3: Host structure types.

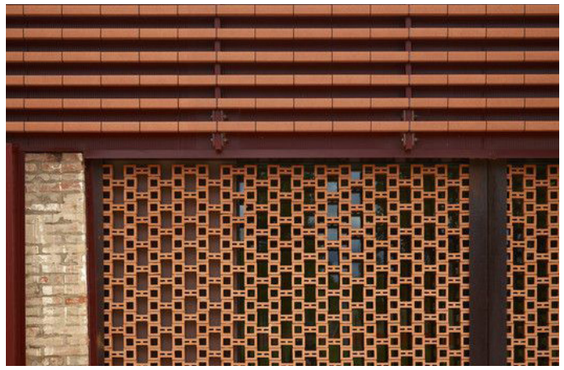
- This group somehow needs to be tied together through the design. A research on this topic should be conducted. What are presedents which show such approaches?

PRECEDENTS HERITAGE

EX-FURNACE RICCIONE

- A former industrial complex for the production of bricks
- Now a secondary school, a theatre, and an office building



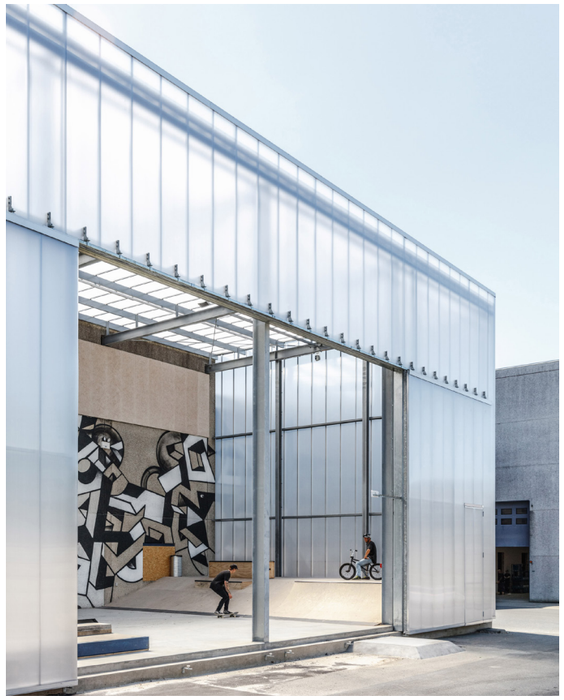


RIGOT STALARS

- Originally a cotton mill founded in 1928, but abandoned for years
- Co-working environment replete with workrooms, a conference space, a micro-nursery, and a cafetaria.

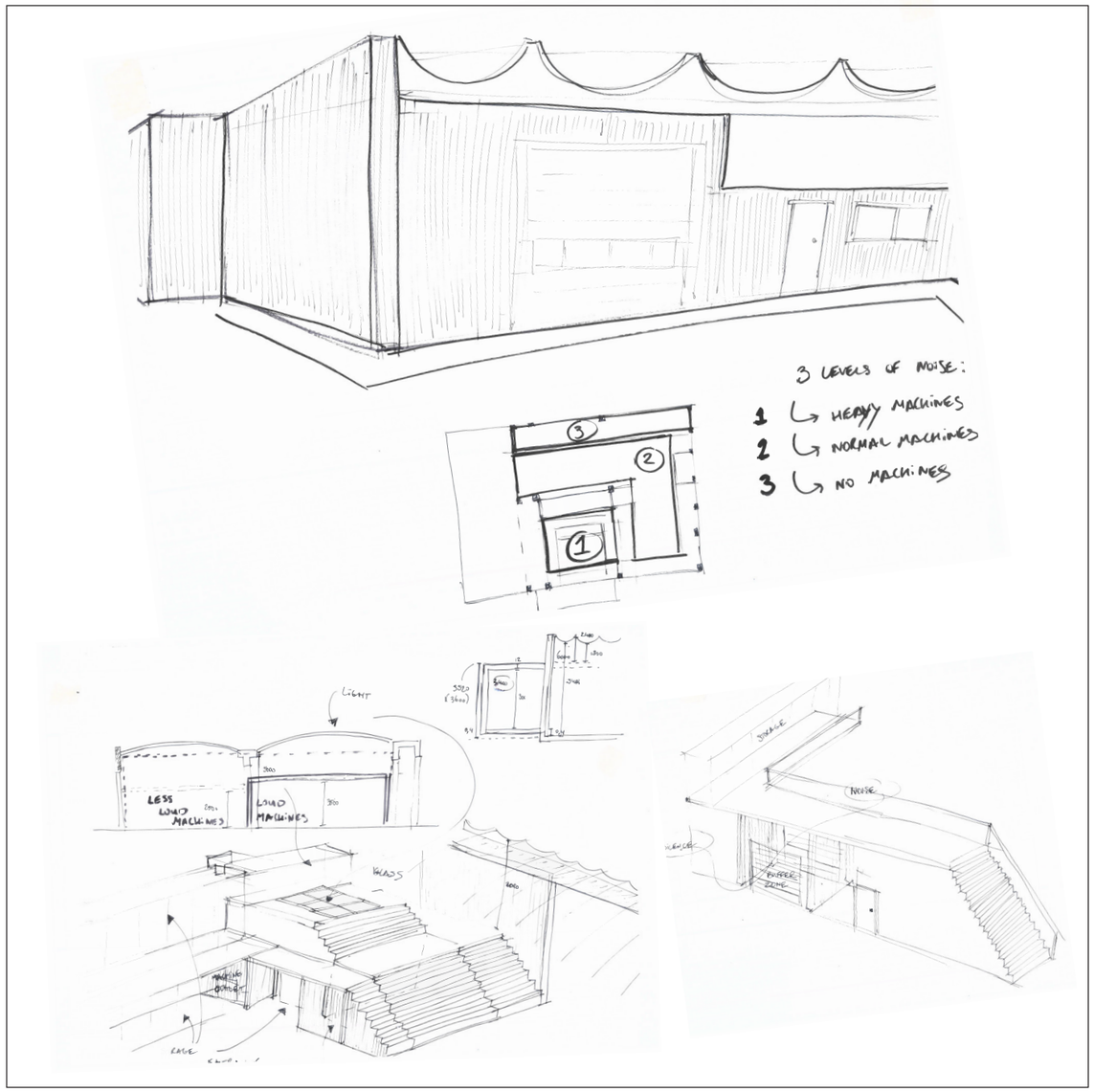
STREETMEKKA VIBORG BUILD, VIBORG

- A former windmill factory
- Now housing a skating bowl, basketball courts, maker workshops and DJ facilities.



WEEKLY DRAWING

FAÇADE



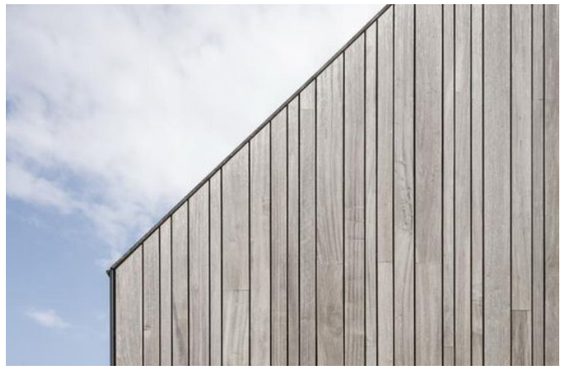
PRECEDENTS TIMBER

TIMBER CLADDING

- The timber cladding belongs to the same colour palette
- Timber cladding is sustainable, the cladding will not be treated and shows the stains of time
- The cladding provides for a great transparant façade, which can look closed from some points of view
- When dark outside, the workshop and timber centre will be visible even more and almost become lantarns with activity inside

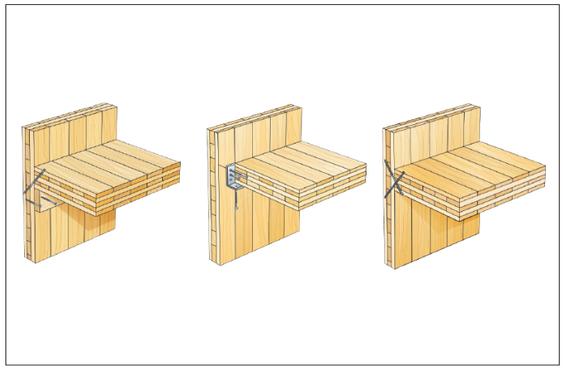
DESIGN IDEA

To keep the idea of the closed façades, but to open them up with. To mirror what is going on now and to emphasize the closed/surprising character of the buildings. A closed building with sometimes a big opening.



TIMBER STRUCTURE

- Structures inside are either made of laminated timber beams, or cross laminated timber elements.
- The structures are as much as possible designed to be modular

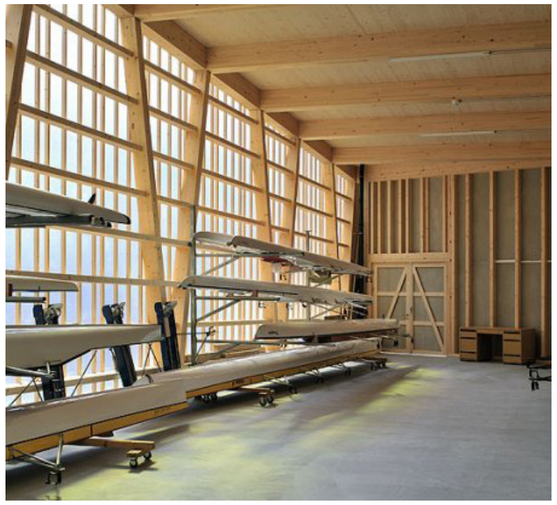


TIMBER GENERAL

HIROKI TOMINAGA ATELIER - PALLETS

FOKKEMA & PARTNERS - WERKZAAK RIVIERENLAND

ORGA - CIRCULAIRE GEMEENTEWERF

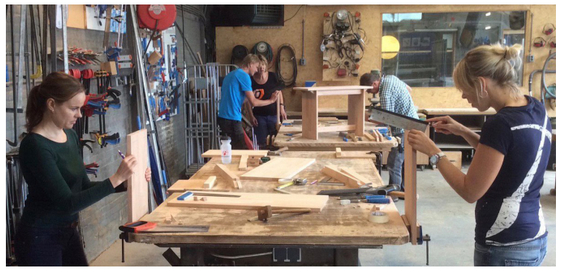


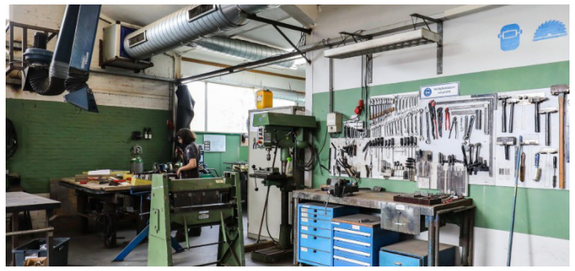
TIMBER SCREEN

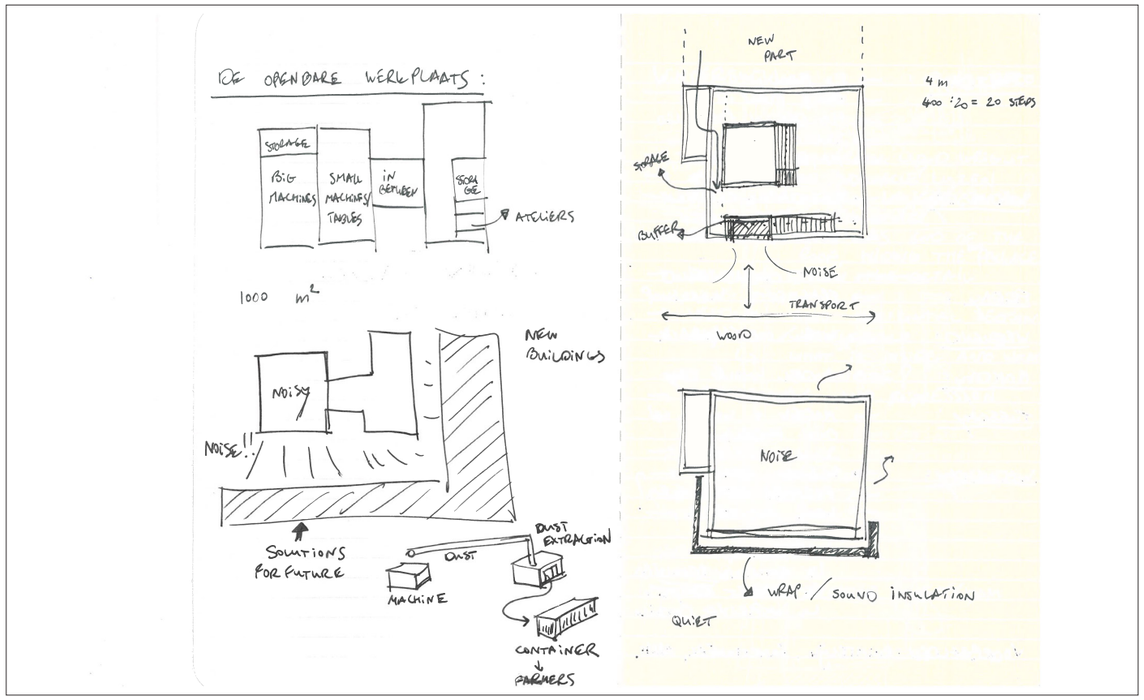
PRECEDENTS TIMBER WORKSHOP

FUNCTIONAL - DE OPENBARE WERKPLAATS, AMSTERDAM

- Shared (timber) workshop where professionals and private creative people can rent a space and work alone or together on several projects.

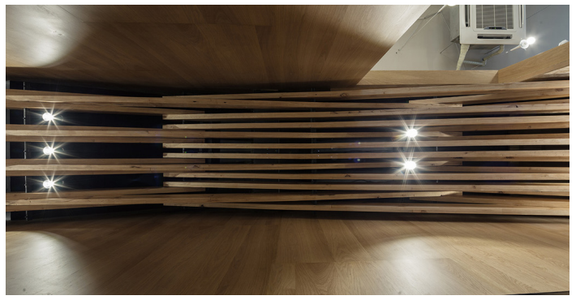


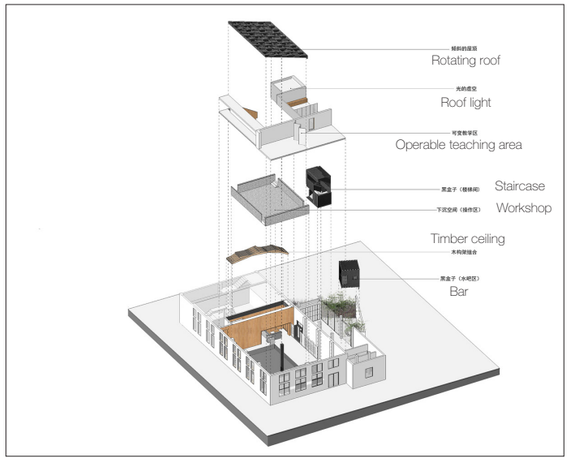


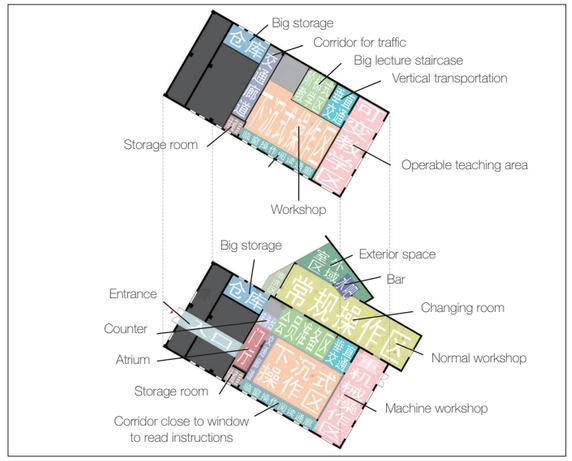


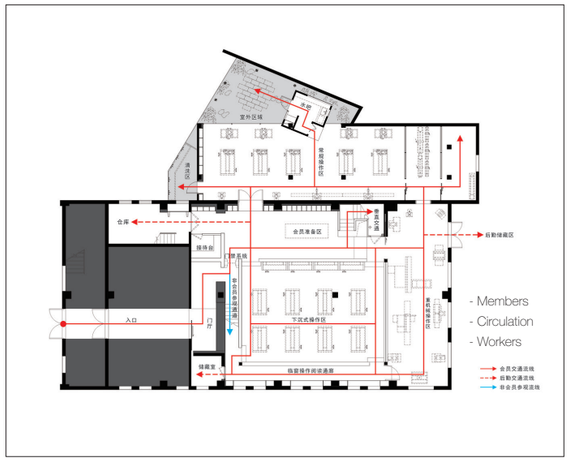
FUNCTIONAL/ARCHITECTURAL - M.Y.LAB WOOD WORKSHOP

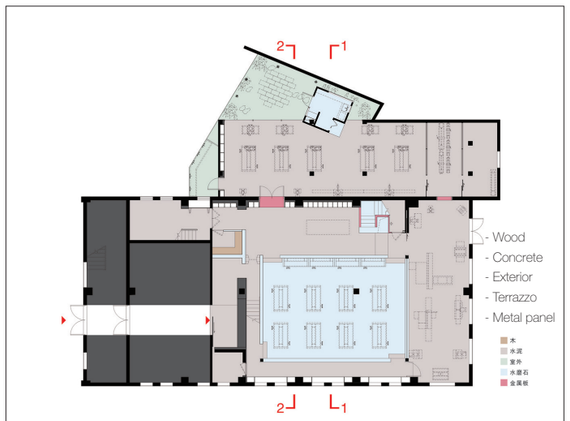
- A transformation project: shared (timber) workshop where timber craftmanship is give back its importance
- Rooms with machines and rooms with tables are seperated from each other
- The working area is visible from multiple point of views and forms the heart of the project

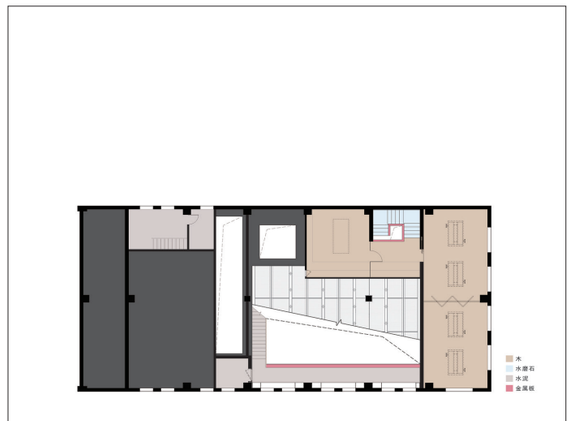






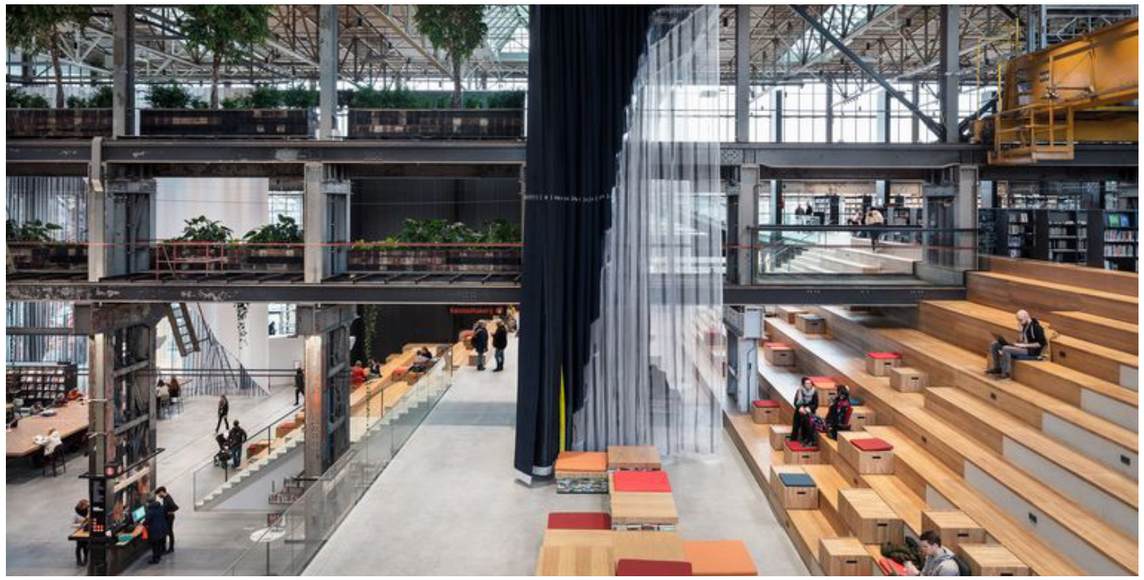


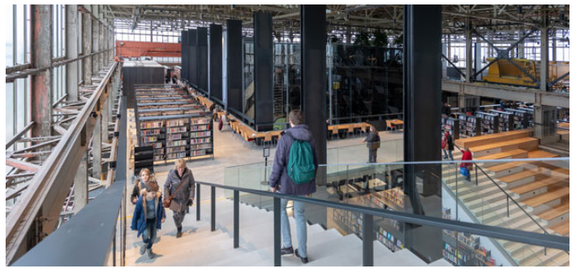


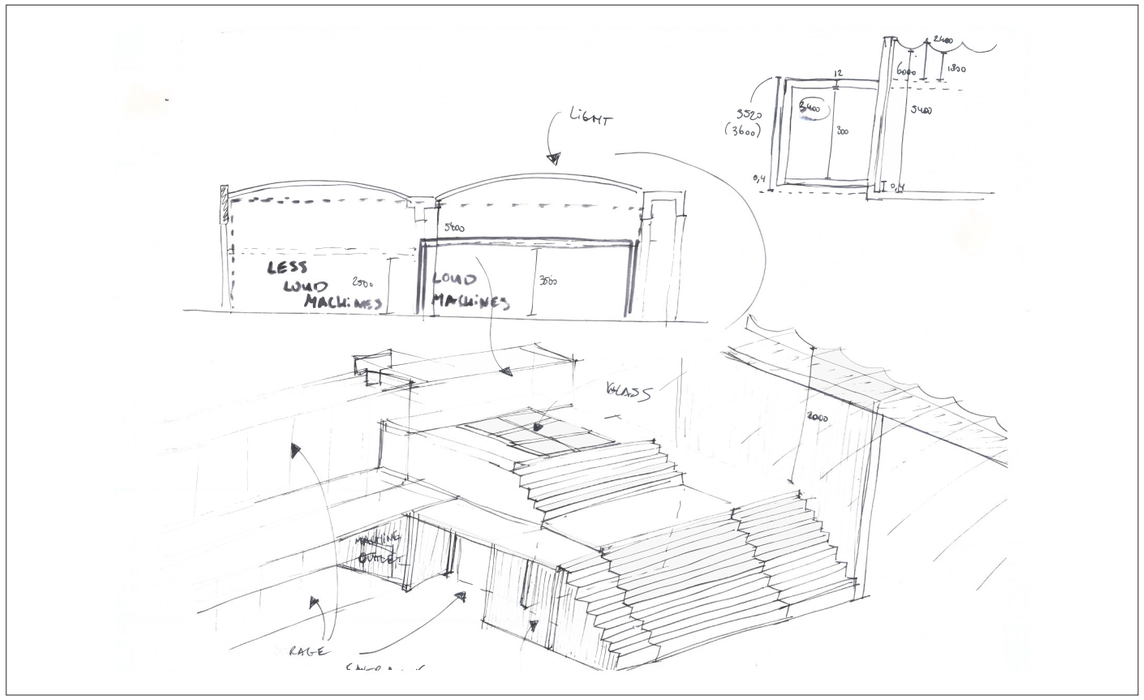


ARCHITECTURAL/SPATIAL - LOCHAL, TILBURG

- A transformation project of an old locomotive factory. There is a library, study spots, an event hall, freelance working spaces, food and much more





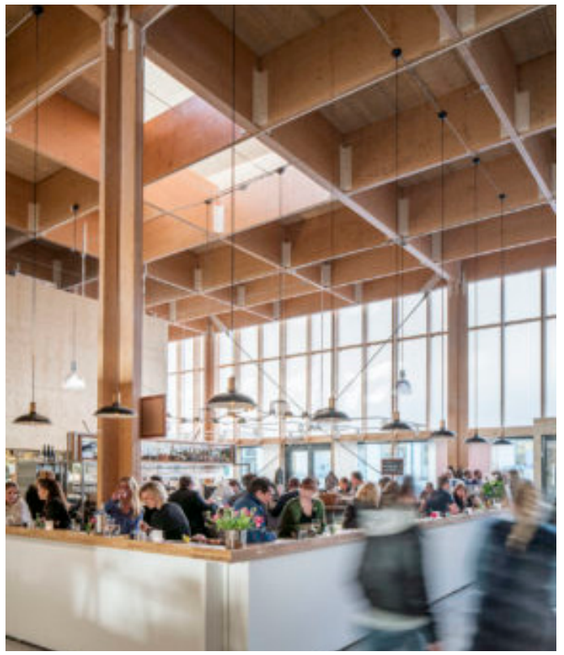


ARCHITECTURAL - HOUTCENTRUM, IJLST

- Ijlst used to be the timber village of The Netherlands. This design is a museum which is focussed on bringing timber into attention again and to show the history of wood and the village.
- The building is also meant to use for other different functions. A workshop, small movie theatre and meeting room are also part of the programme.

ARCHITECTURAL - MARKET HALL, STOCKHOLM

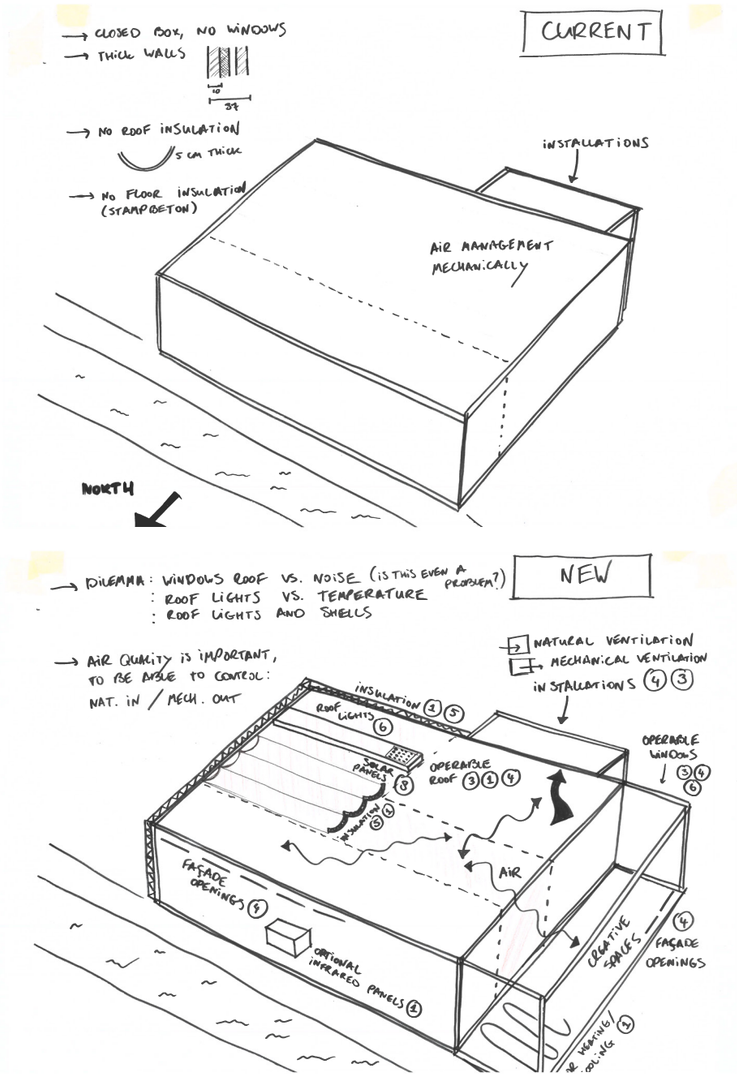
- Temporary market hall made out of wood, glass and plastic
- The building is completely demountable and can be built again somewhere else



WEEKLY DRAWING

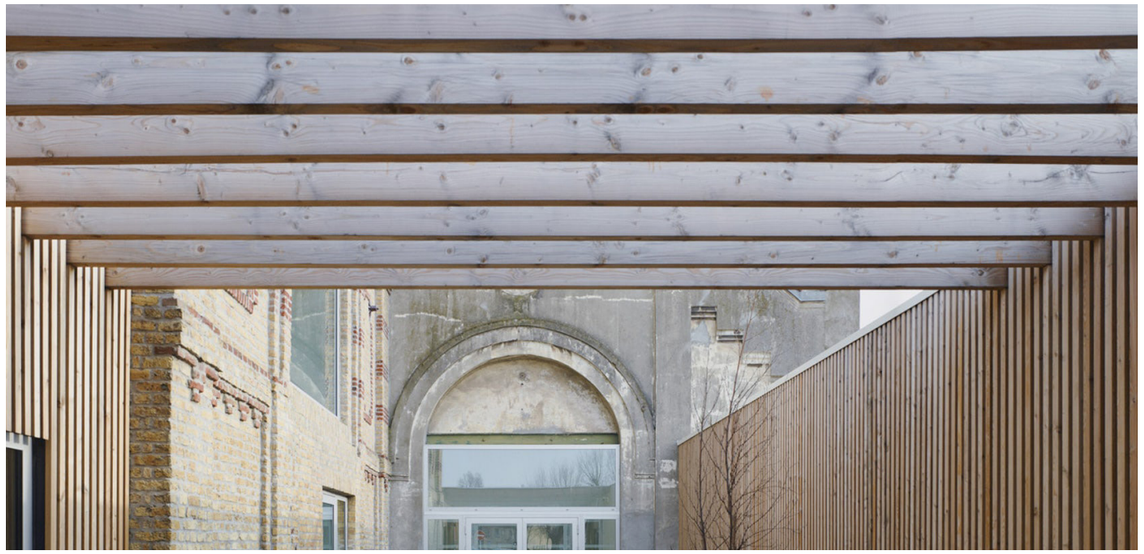
BUILDING TECHNOLOGY

20-02-2020

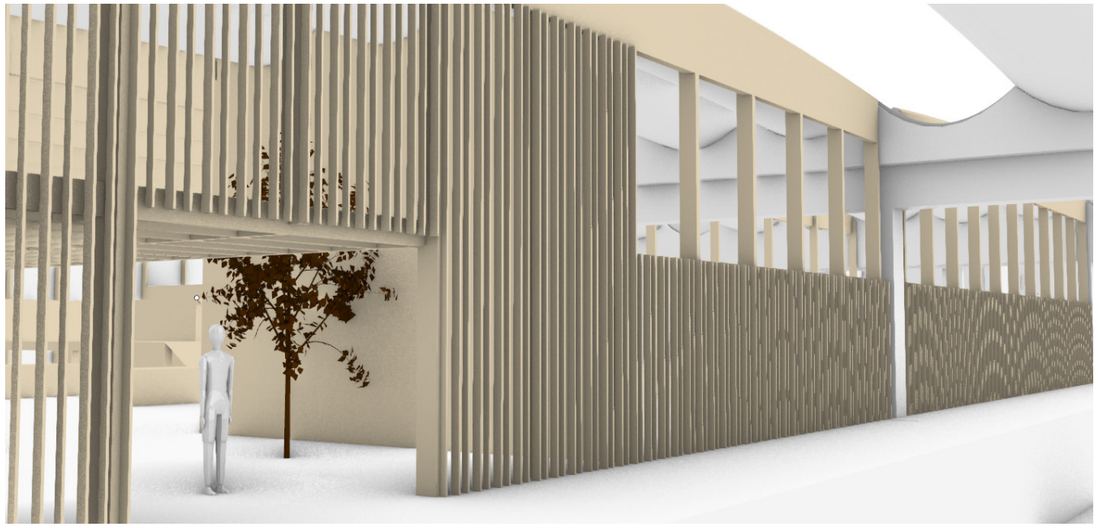


PRECEDENTS ENTRANCE

THE ARCHITECTURAL PROMENADE

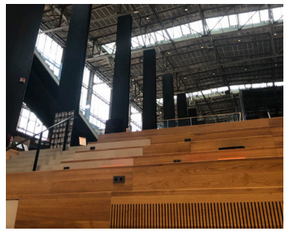


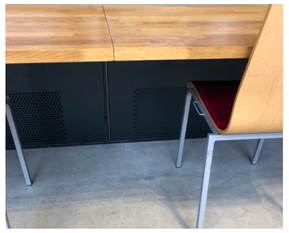
ENTRANCE + FAÇADE, 2

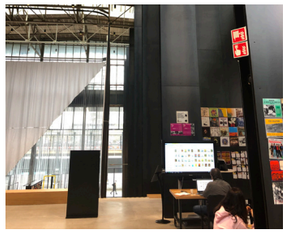


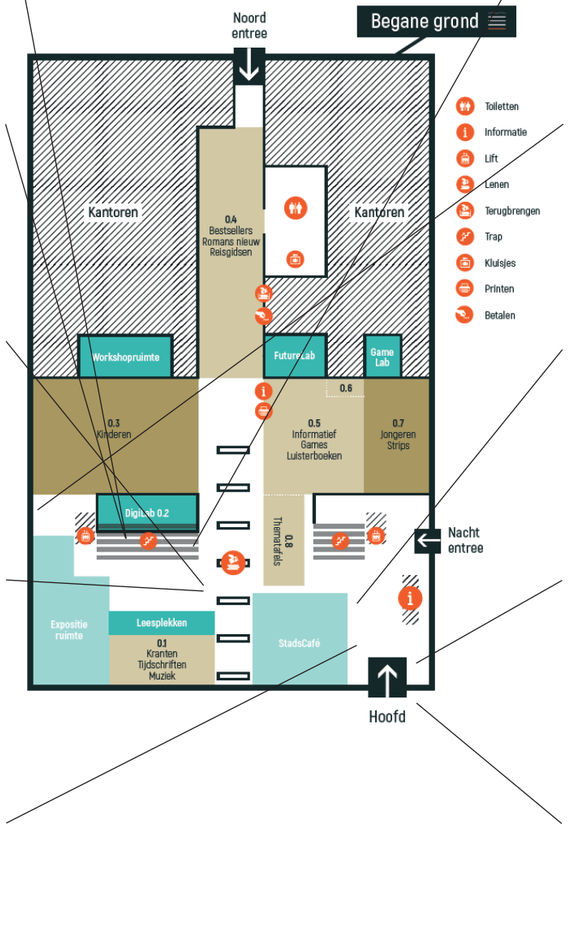
TILBURG EXCURSION

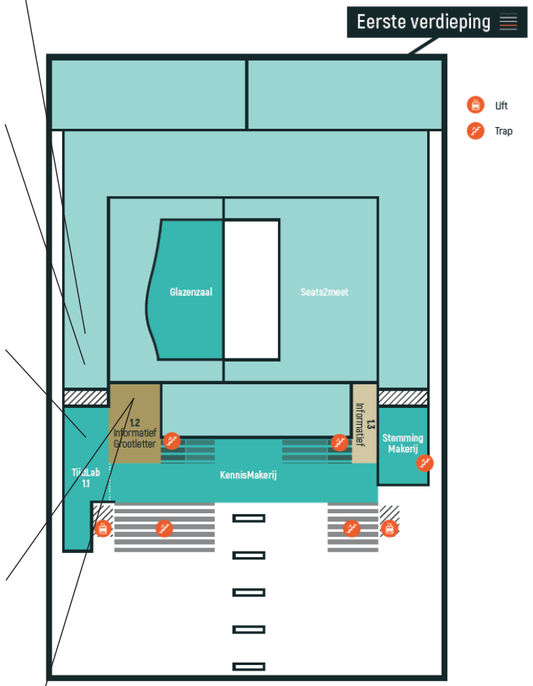
LOCHAL





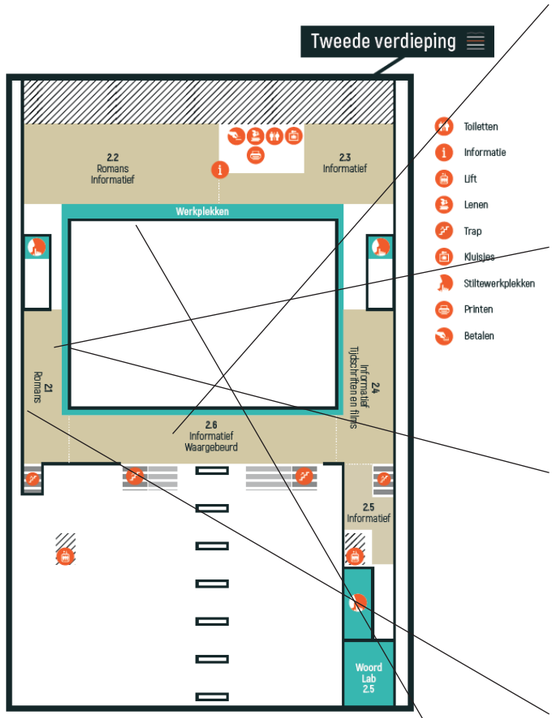


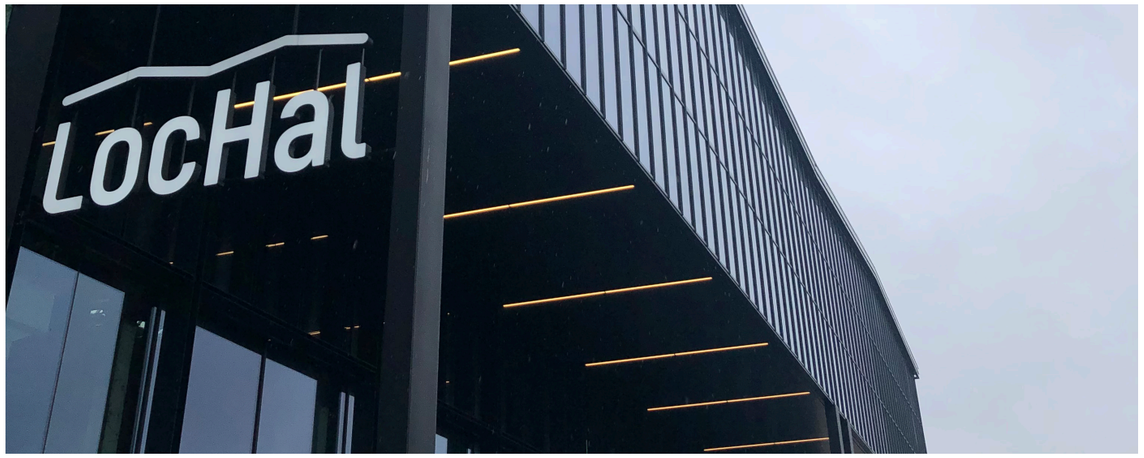


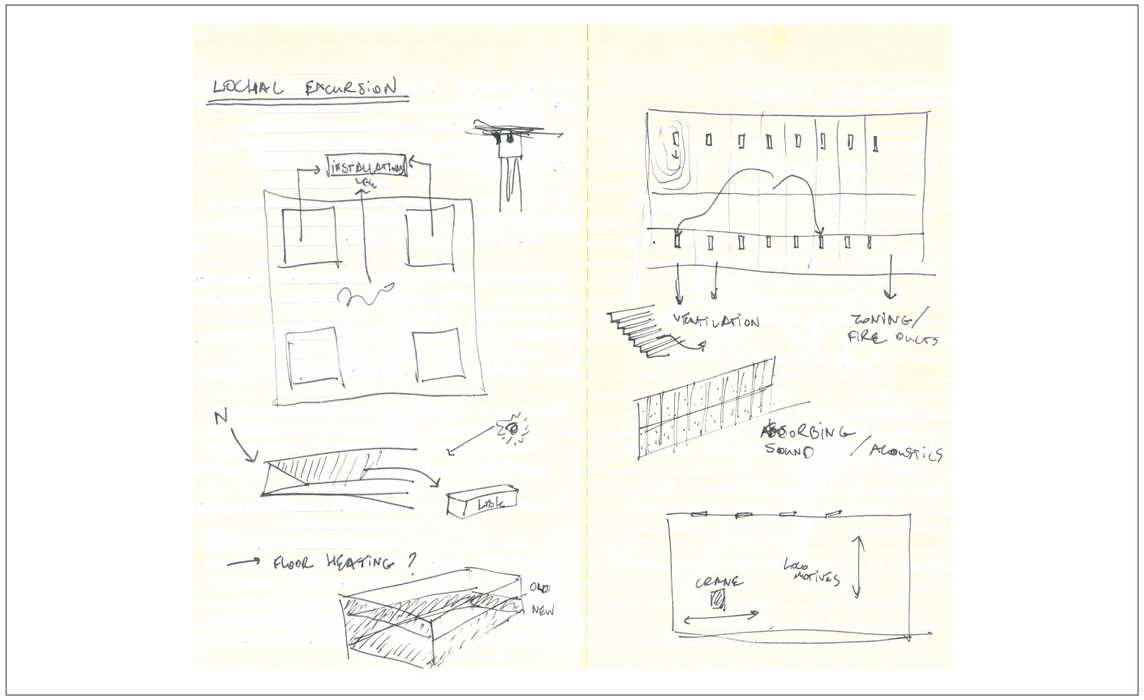


TILBURG EXCURSION

LOCHAL



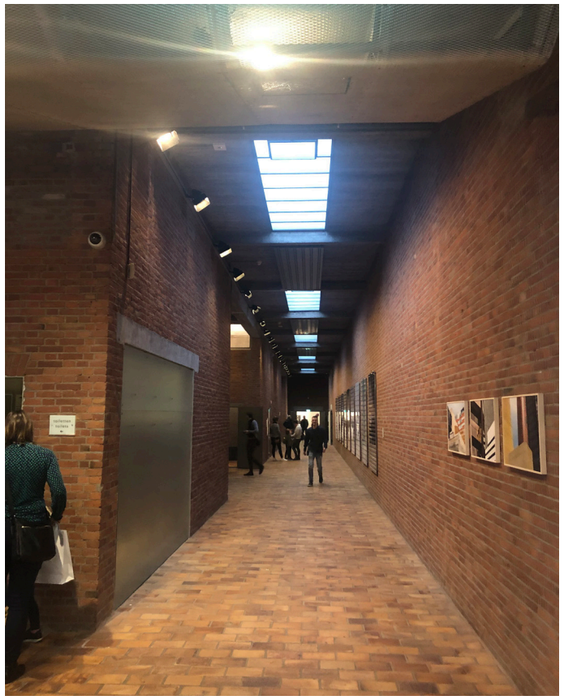




TILBURG EXCURSION

TEXTIELMUSEUM

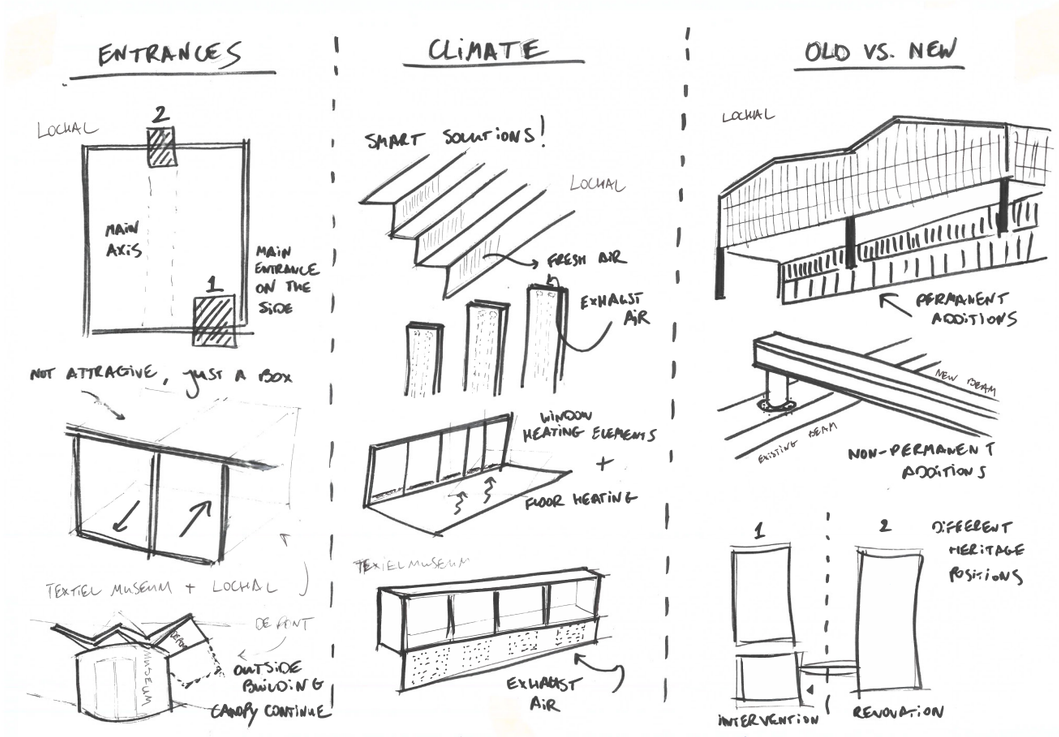
MUSEUM DE PONT



WEEKLY DRAWING

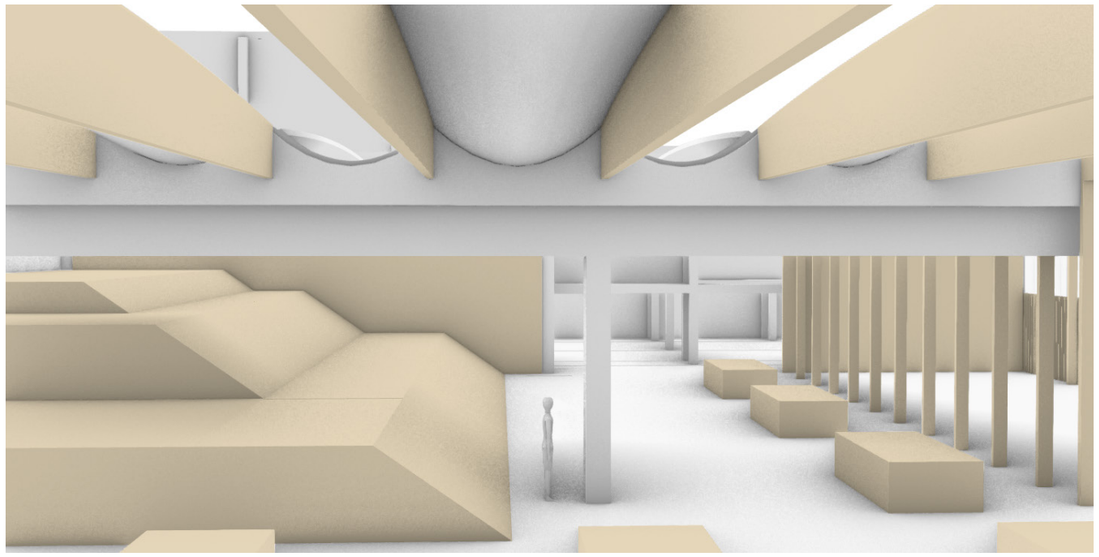
27-02-2020

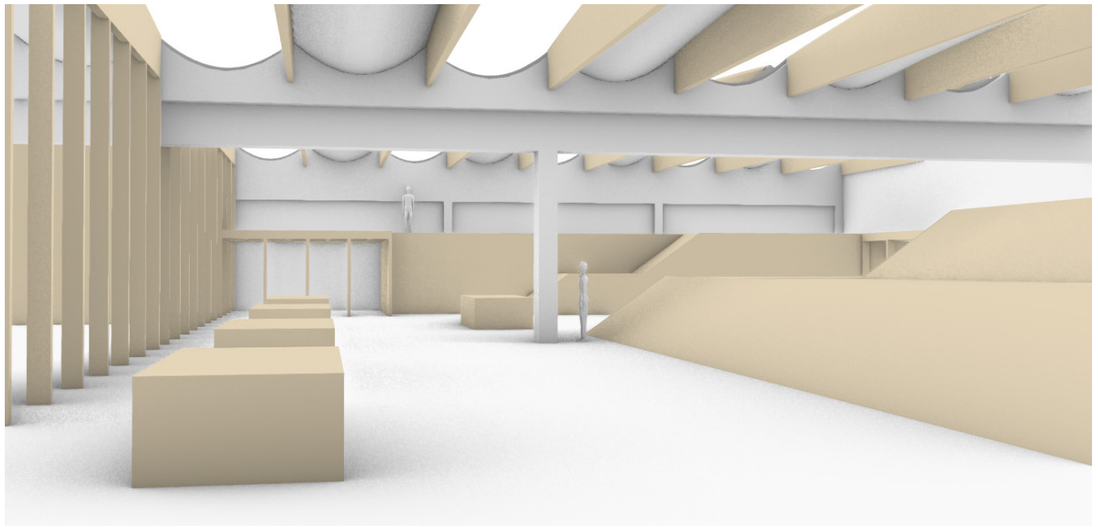
TILBURG EXCURSION



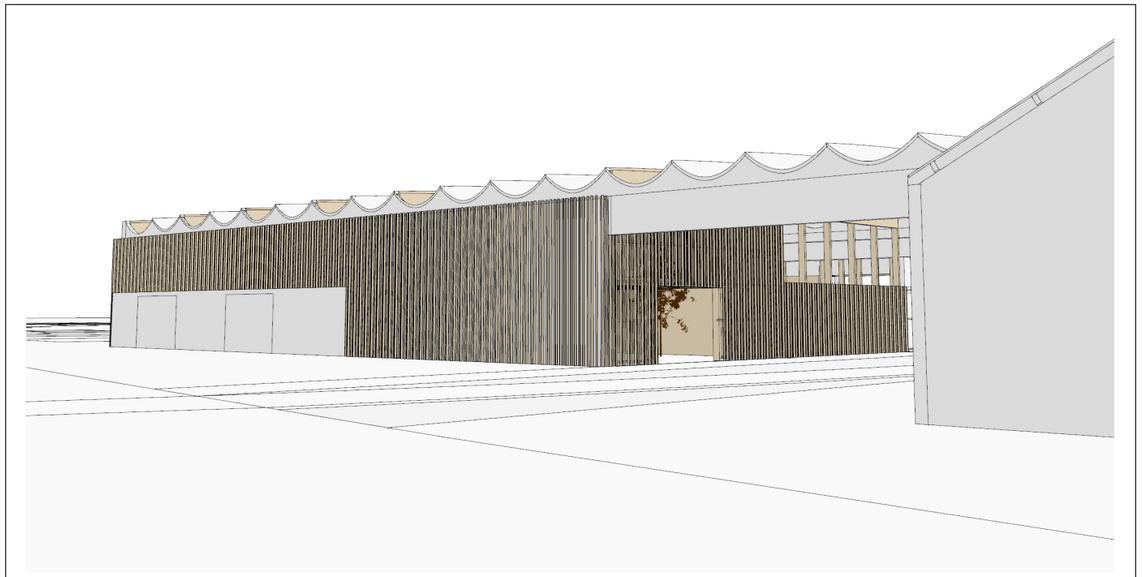
DESIGNING

INTERIOR





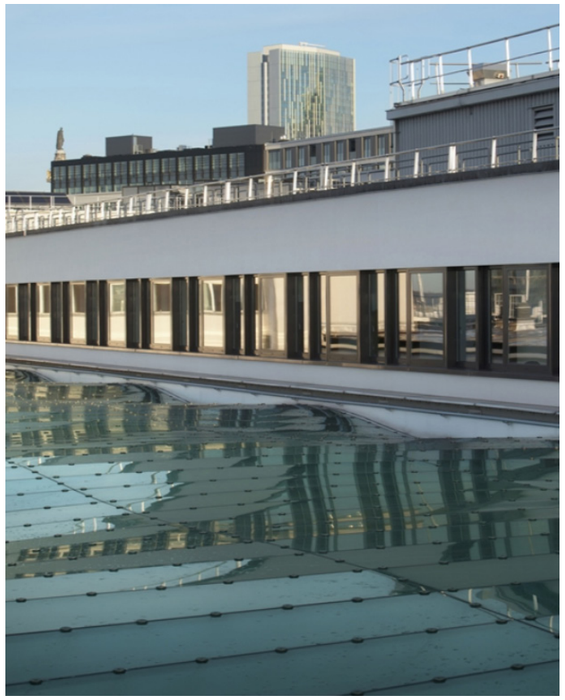
FAÇADE



PRECEDENTS GLASS ROOF

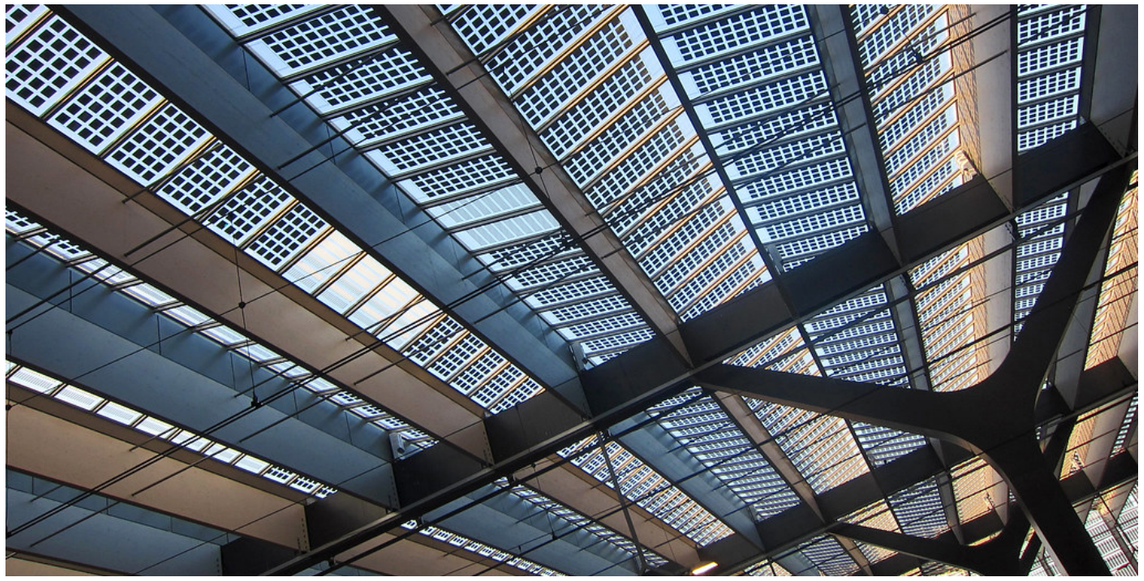
NATIONALE BANK BELGIË

- DOK Architecten
- Double curved glass roof with invisible connections



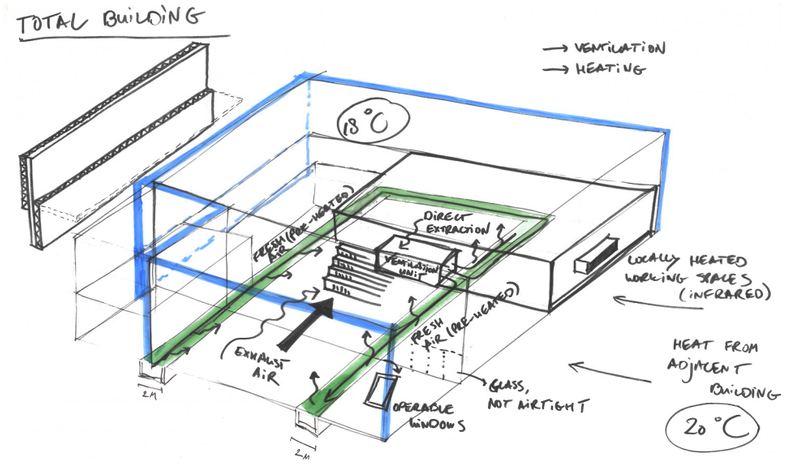
SOLAR PANEL ROOF

- Rotterdam Central Station
- Porta Susa Station Turin
- Messe Essen Exhibiton Center



DESIGNING

INTERIOR



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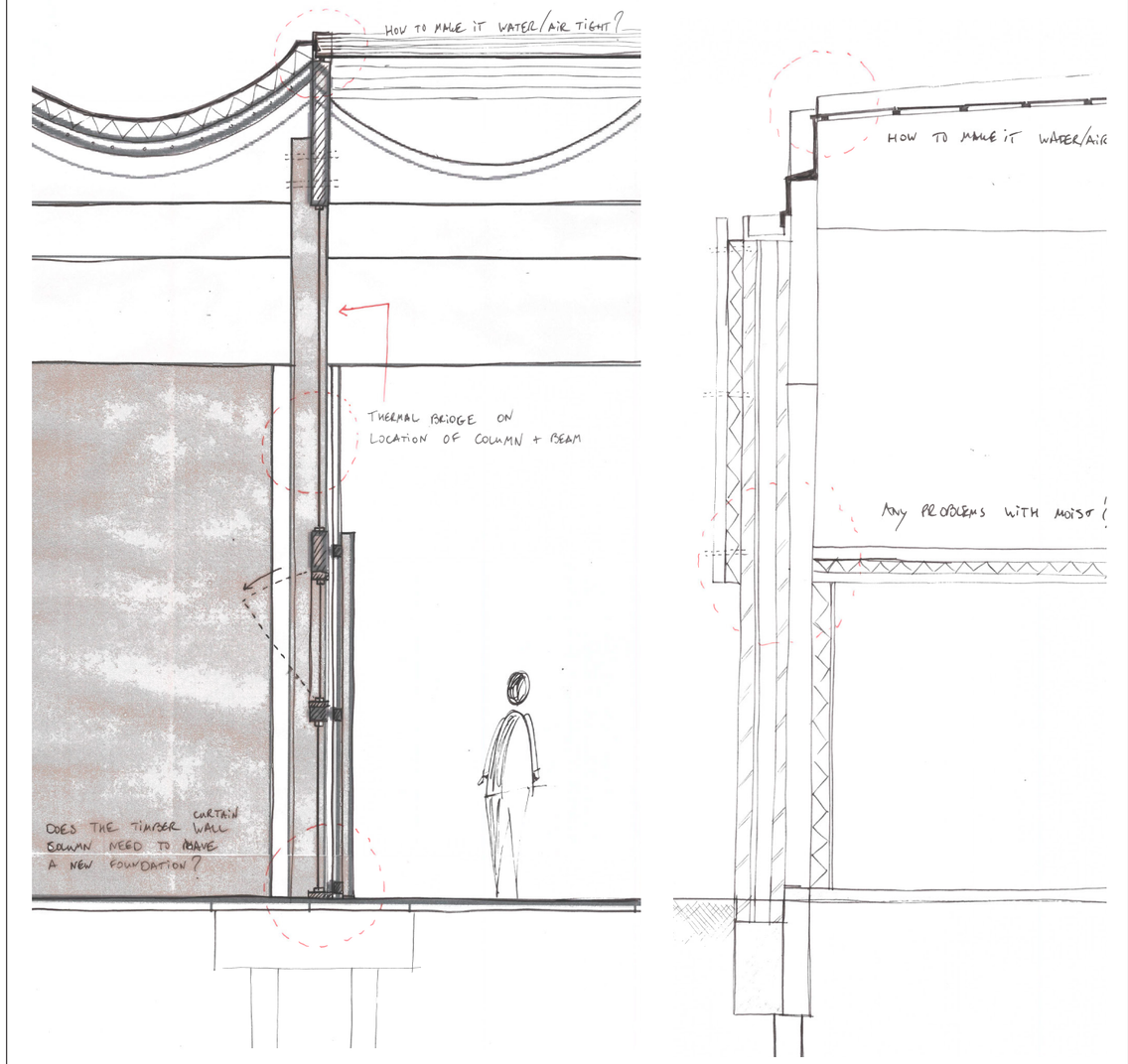
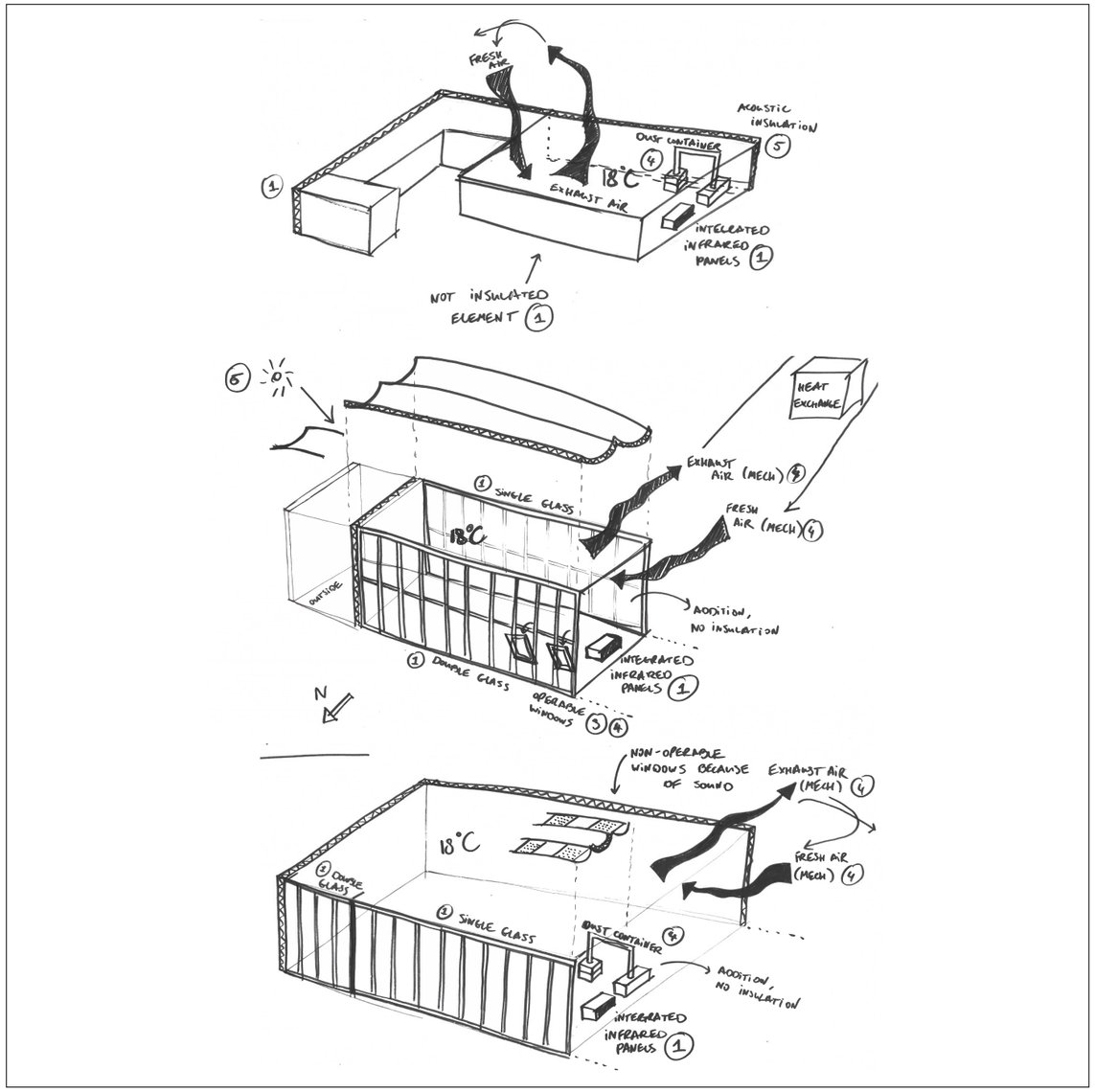


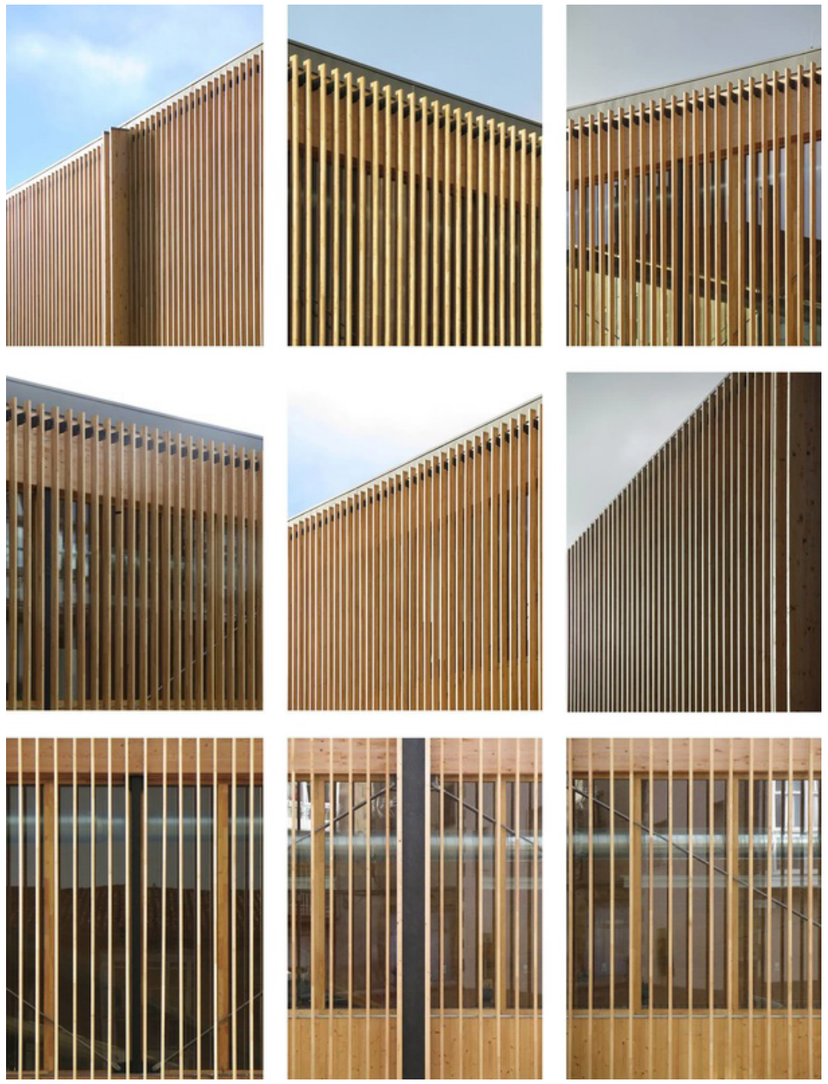
WEEKLY DRAWING

RE-DO / RETHINK

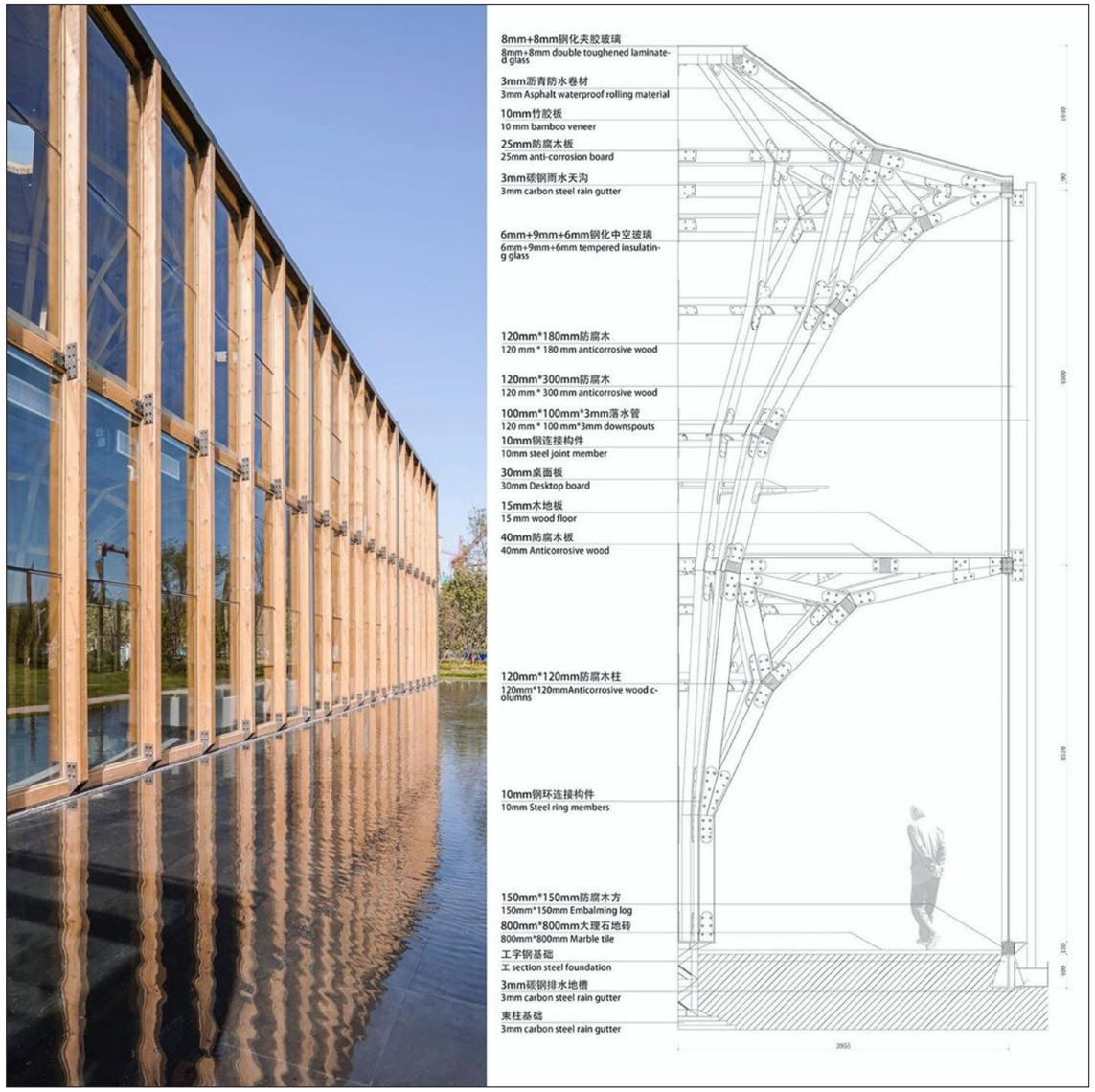


MODULAR TIMBER STRUCTURE

DE ABAJO GARCÍA - IMPLUVIUM

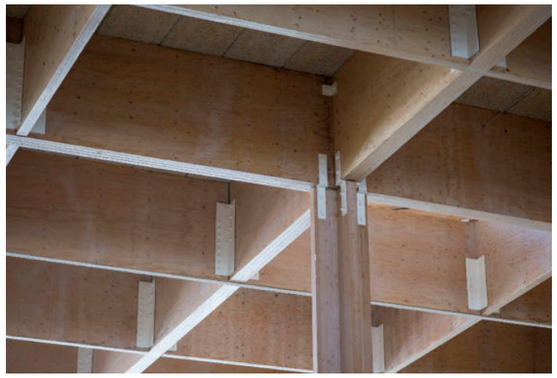


LUO STUDIO - LONGFU LIFE EXPERIENCE CENTRE



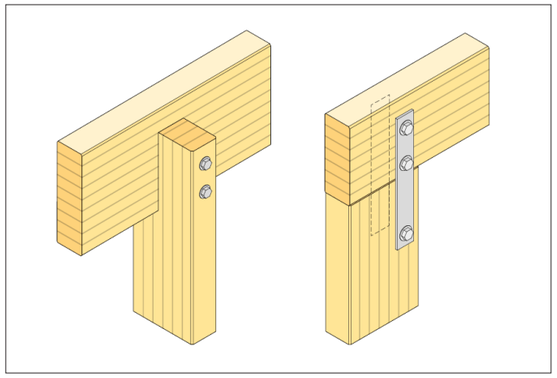
TIMBER STRUCTURE

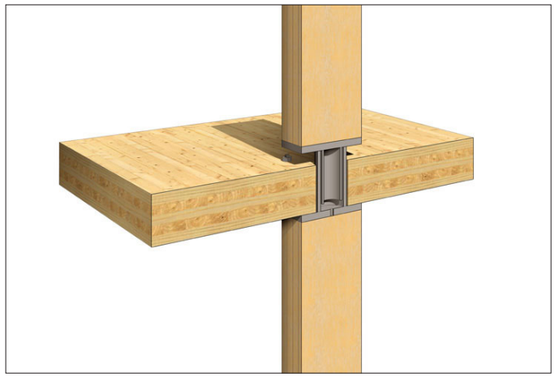
MODULAR CONNECTIONS / JOINTS



Tengbom - Market Hall

Kengo Kuma - Nest we Grow





Acton Ostry Architects Inc. - Brock Commons

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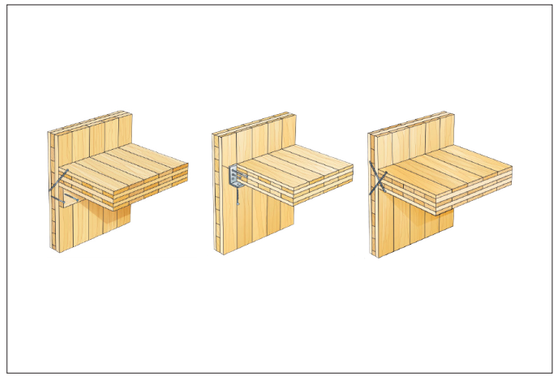
CONNECTIONS / JOINTS

Works Progress Architecture - Framework

Studio Botter - Congress and Exhibition Centre



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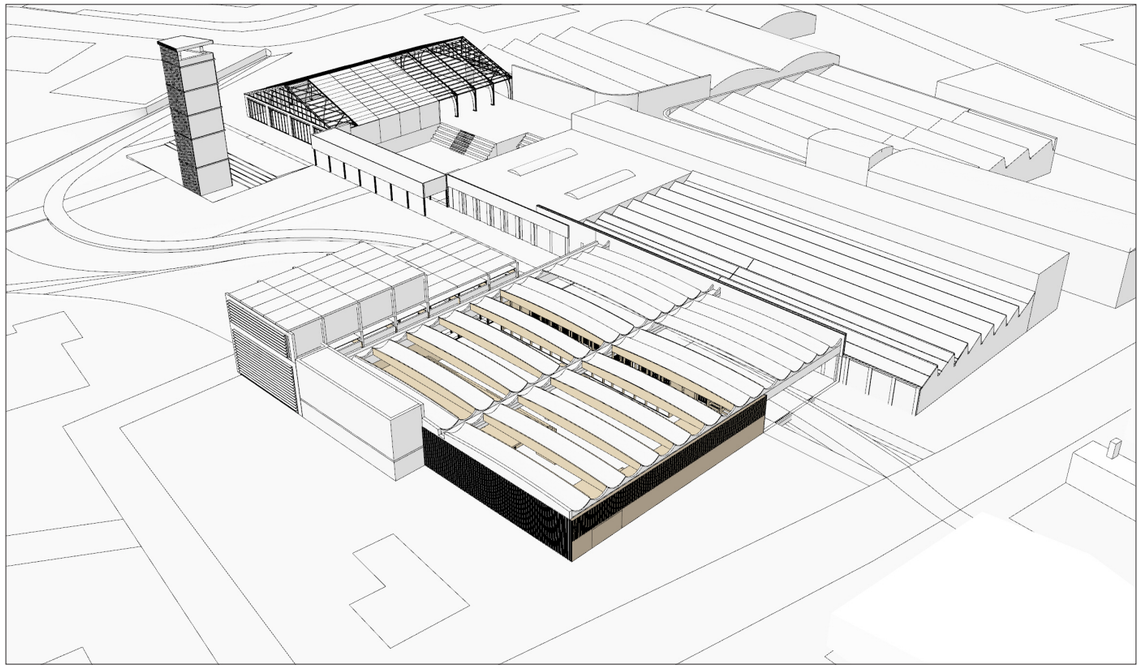
Rothoblaas Alumidi

-

DESIGNING

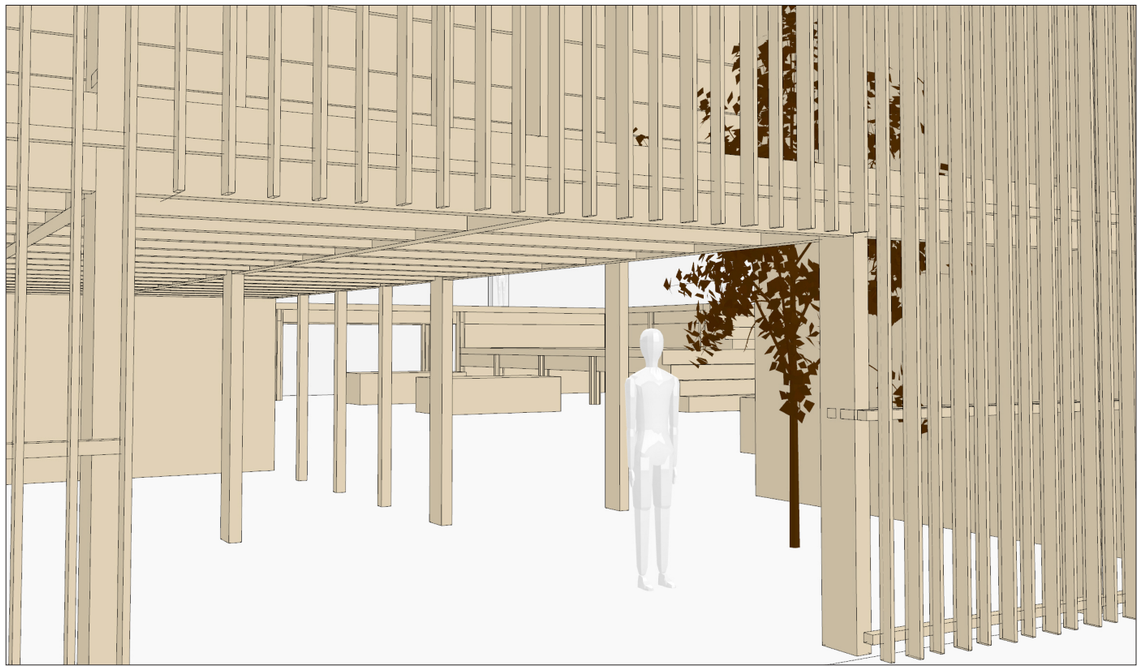
INTERIOR



INTERIOR

FAÇADE

FAÇADE



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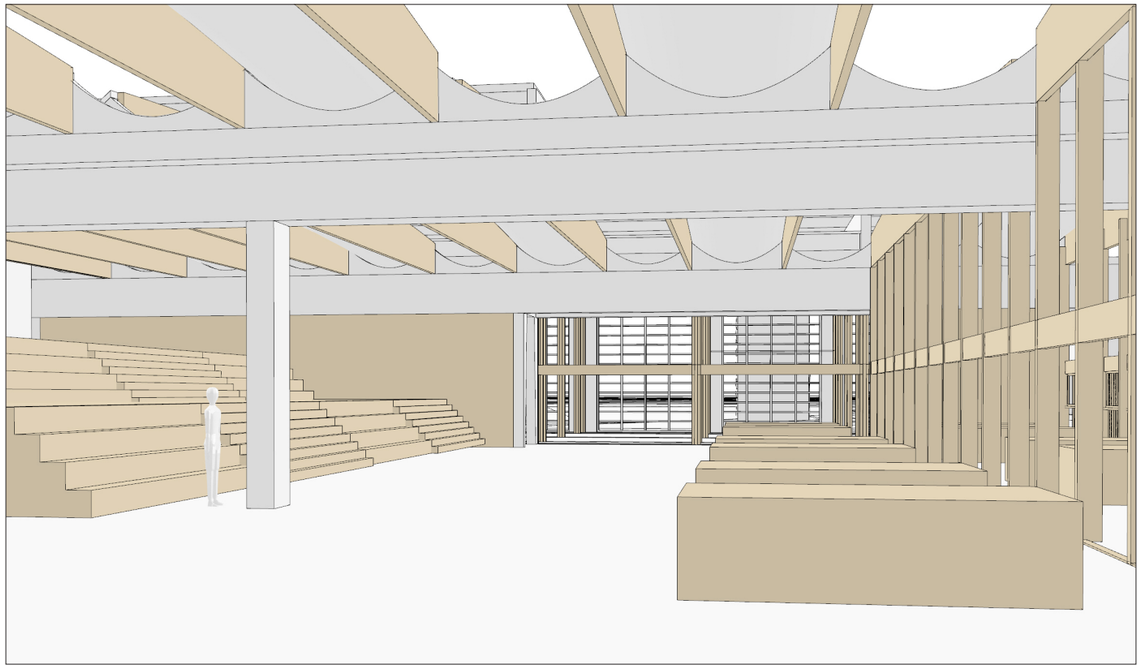

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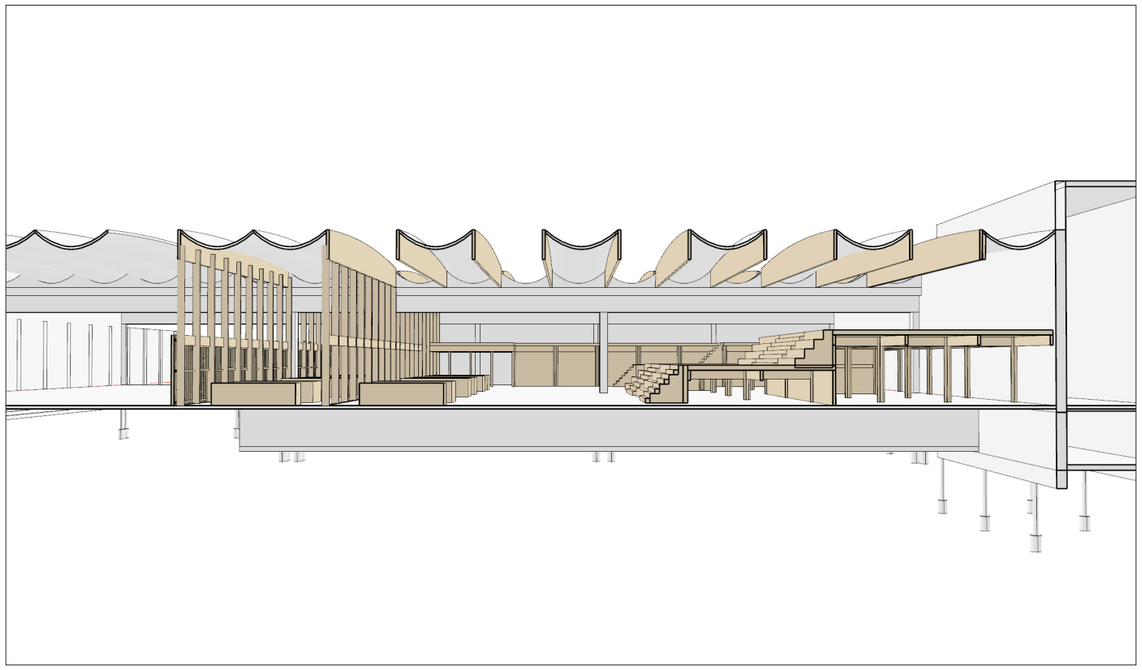

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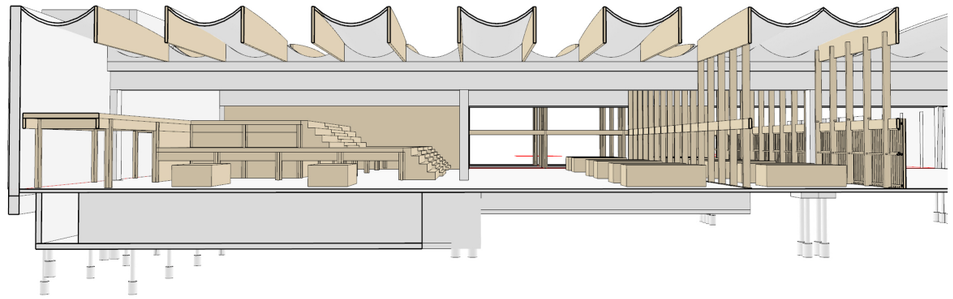
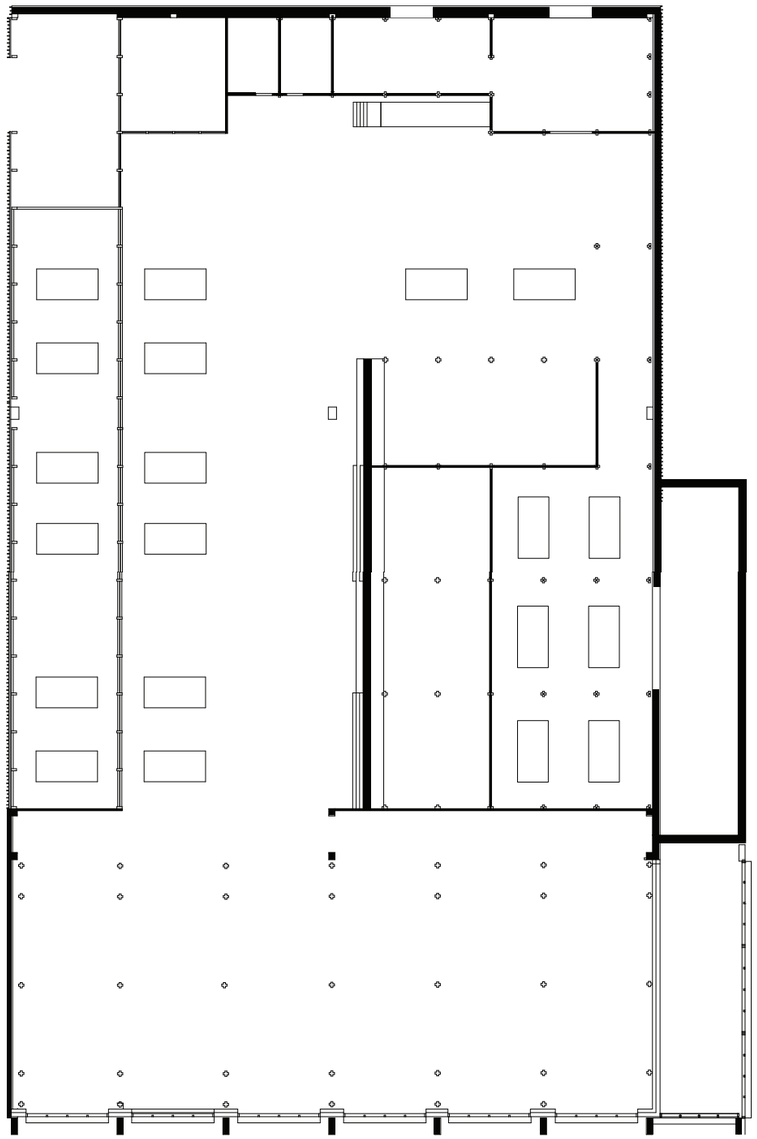


DESIGNING

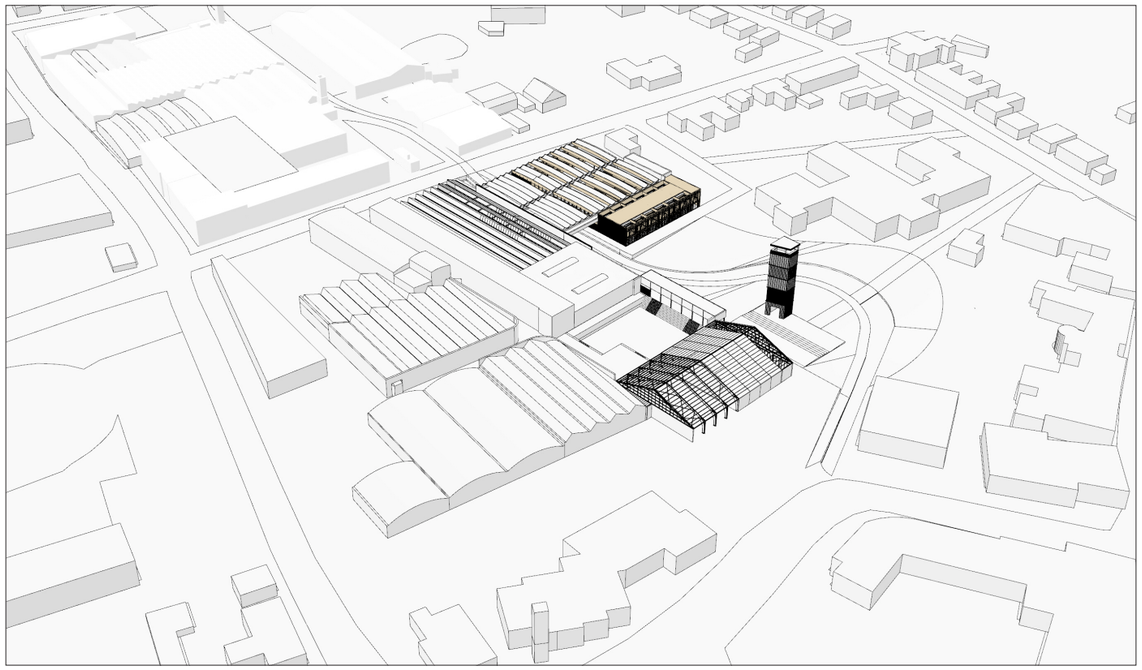


TIMBER TOWN

12-03-2020

DESIGNING

INTERIOR



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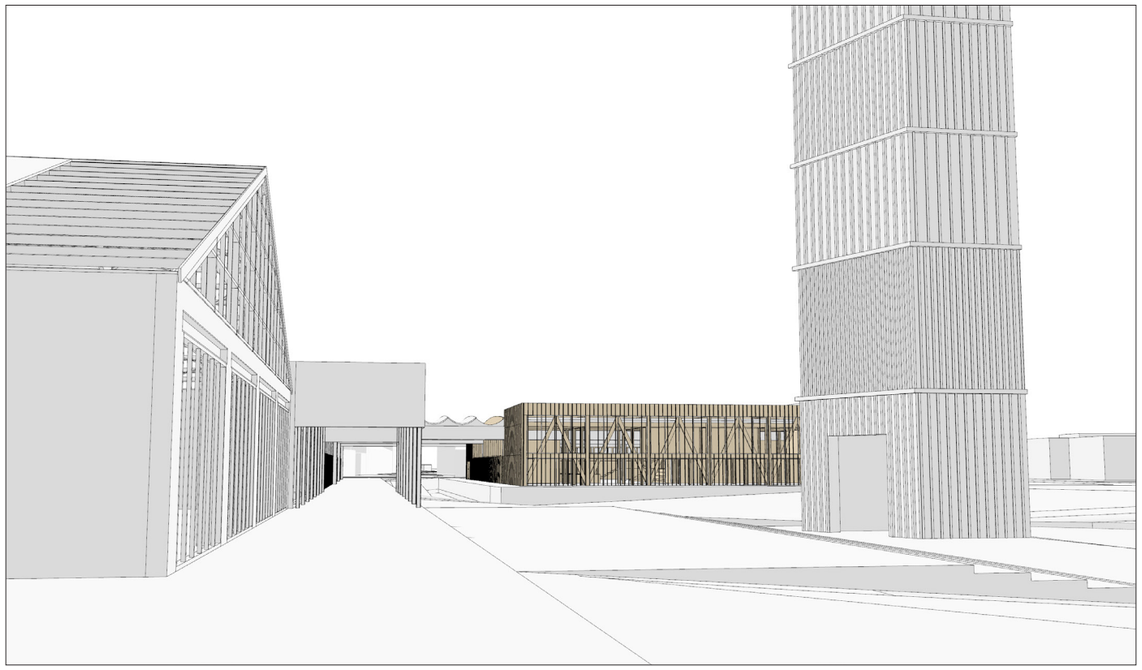

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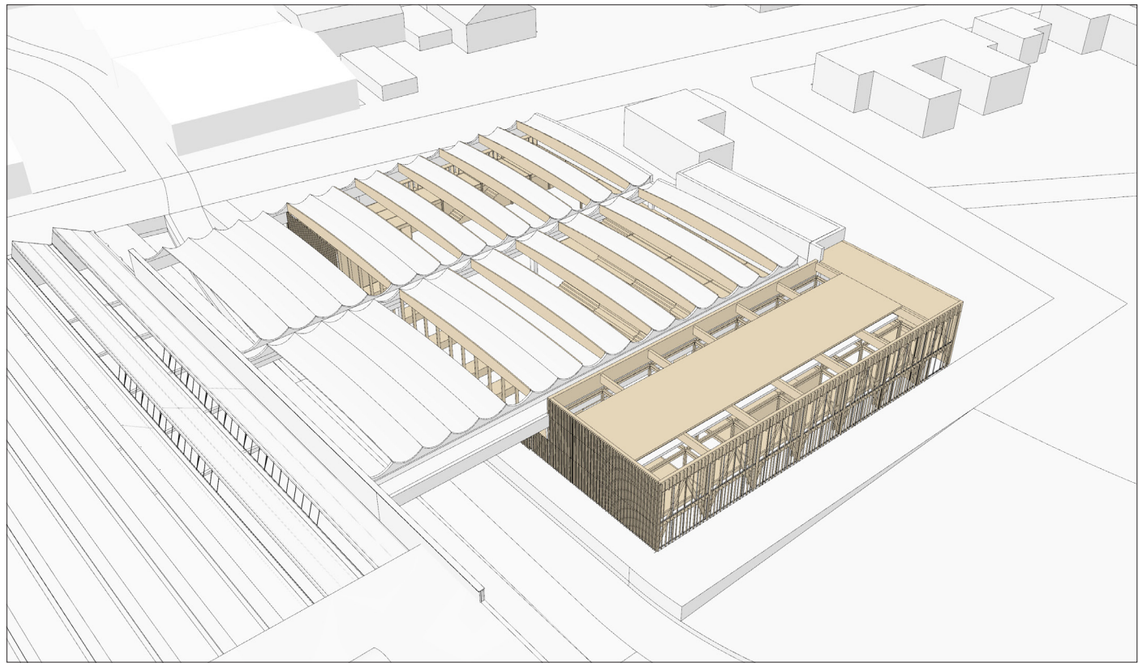

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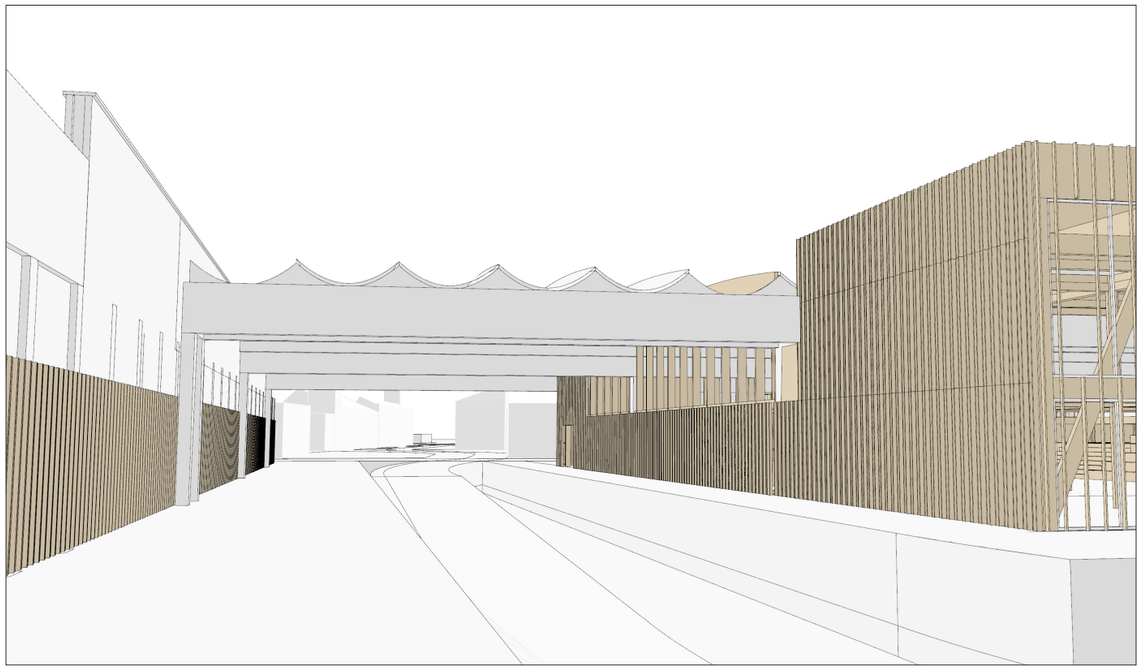
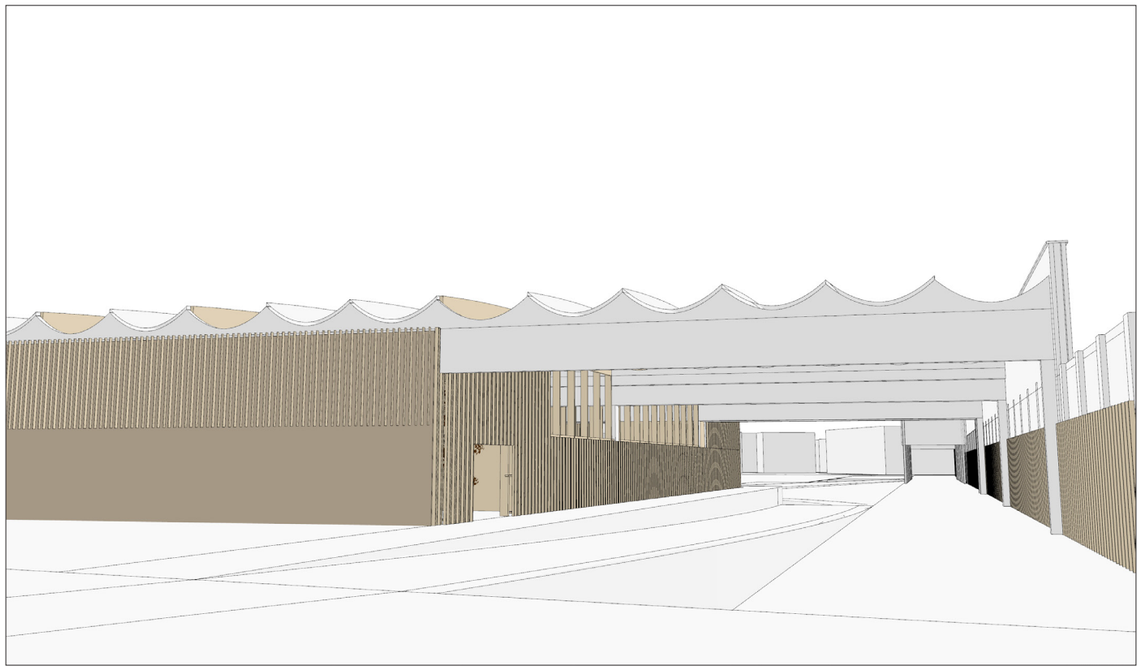
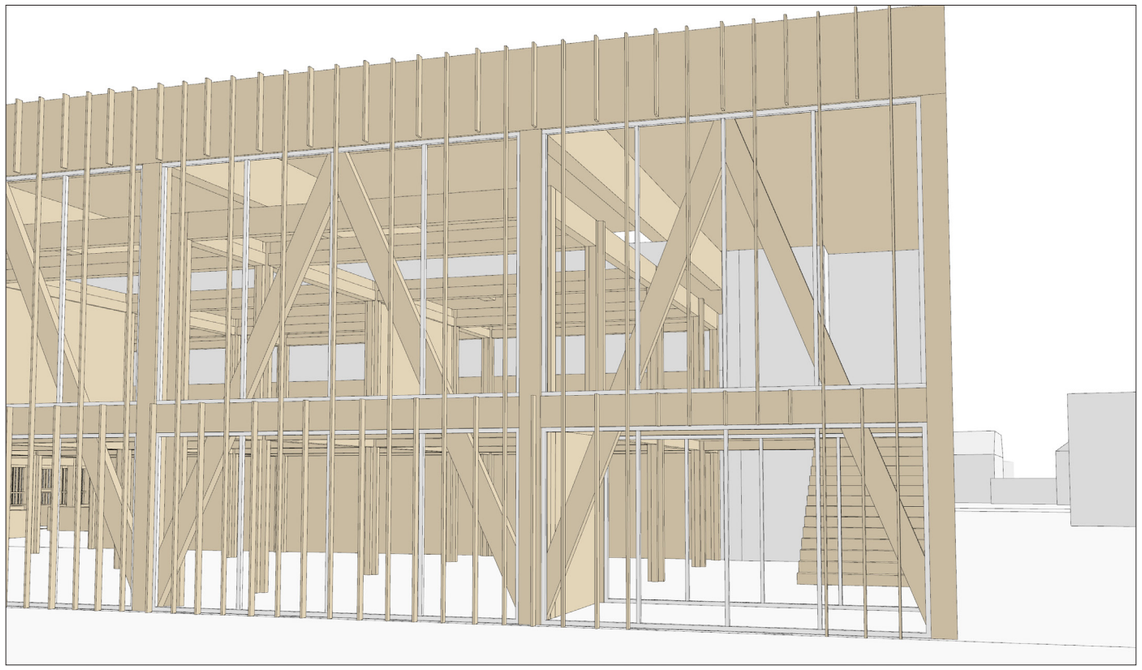


DESIGNING

INTERIOR



INTERIOR



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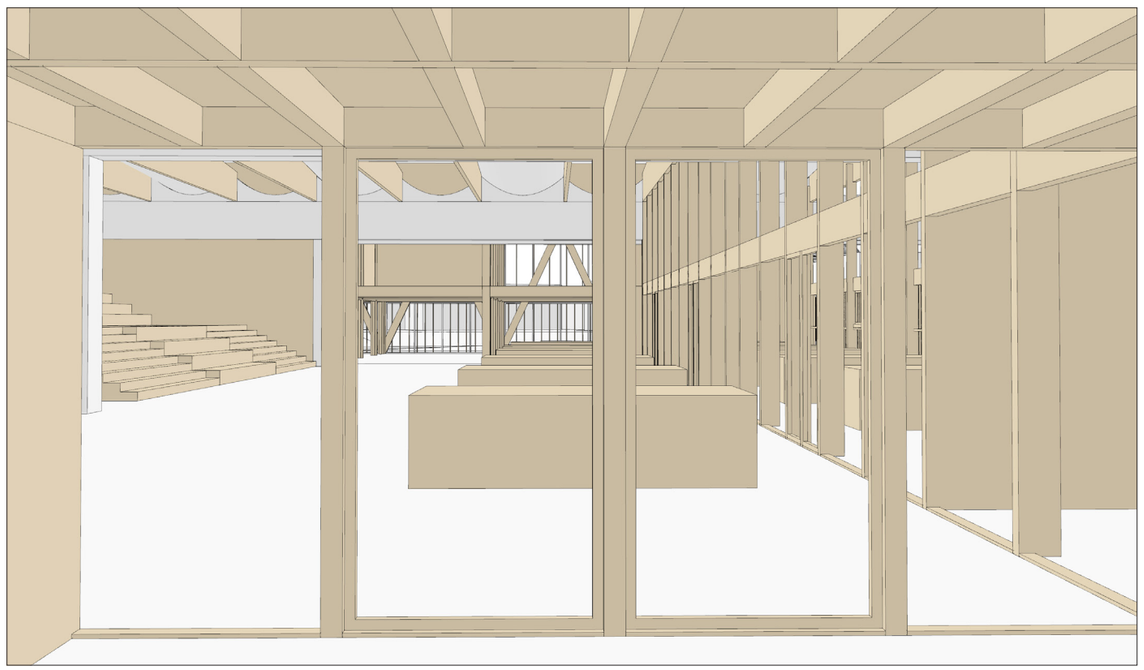
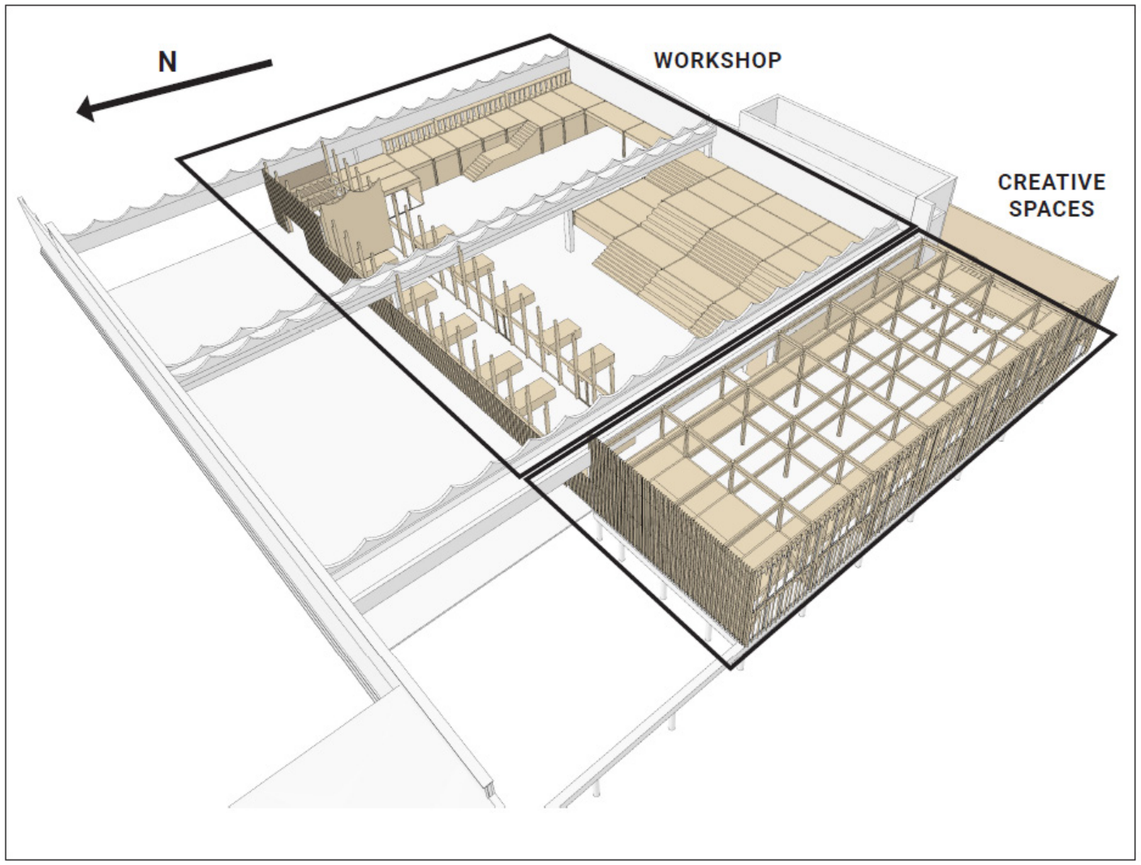


FAÇADE

STRUCTURE

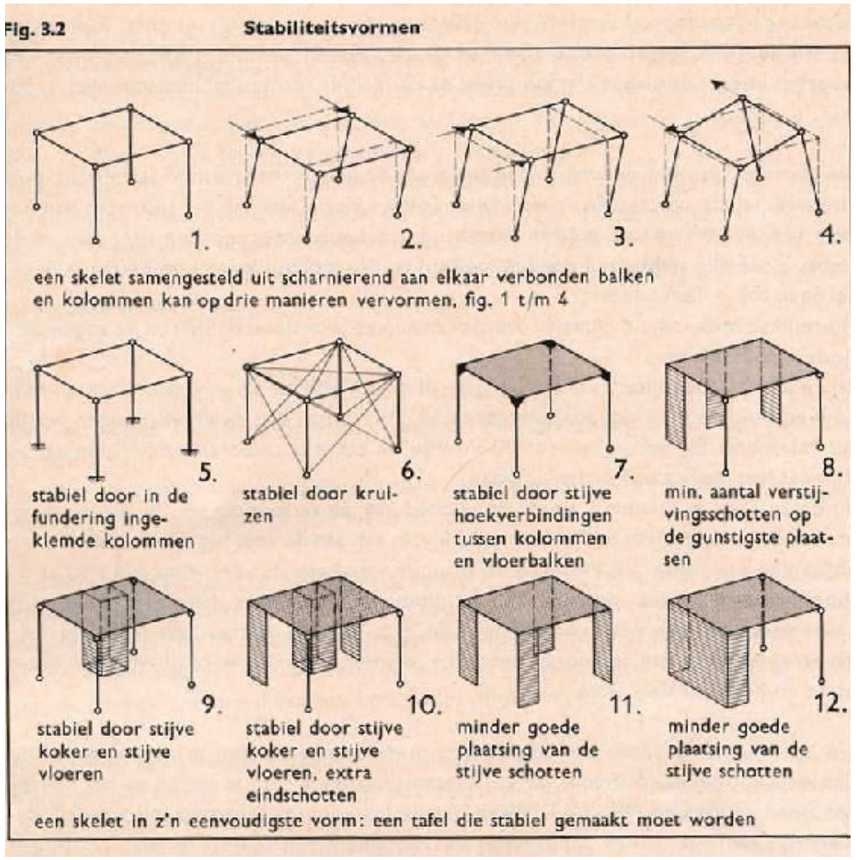
GENERAL BUILT UP

- The grid of both buildings IS SIMILAR, AND is based on the existing building.
- 1850 X 2583
- The façades and changes on the outside of the existing buidling are permanent, whilst the interior is completely demountable



STRUCTURAL SCHEMES OPTIONS

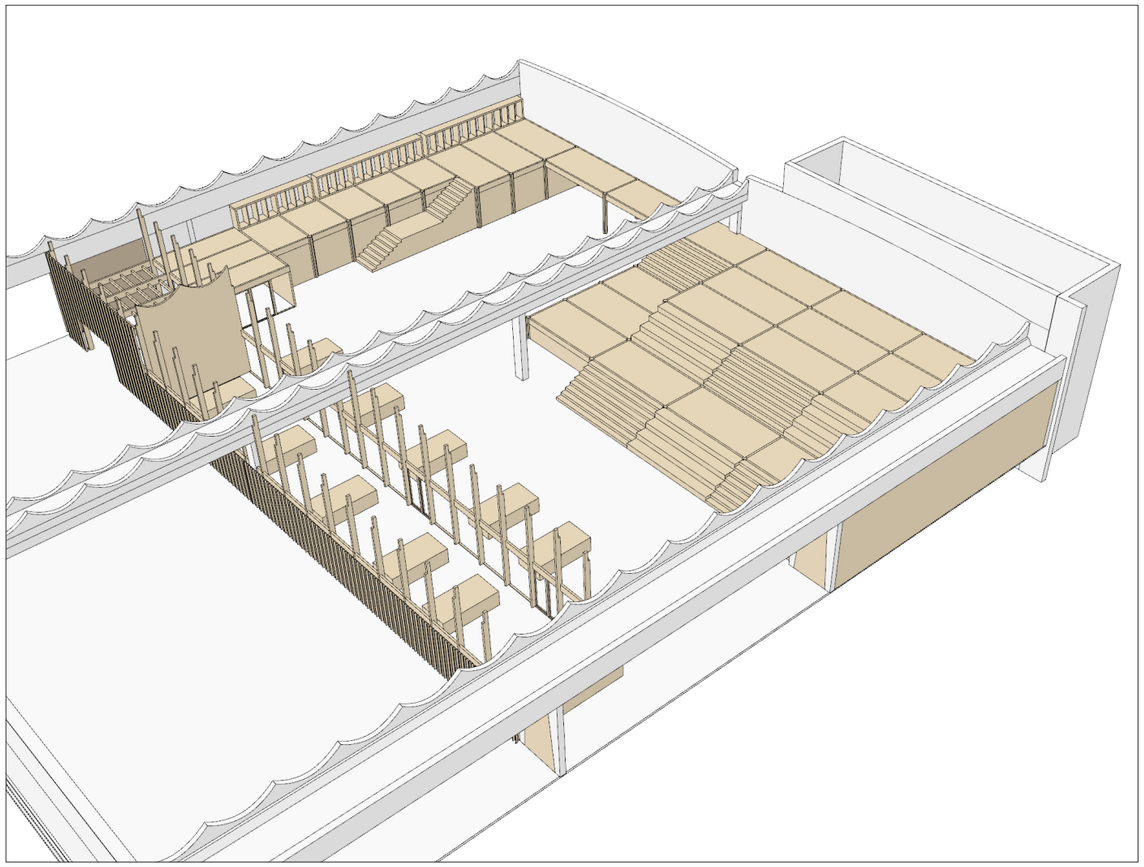
- Options for this structure were considered, where stability played an important role
- Due to the demountability, option 5 is not an option
- Due to the flexibility, option 6, 8, 9, 10, 11, and 12 are not an option
- Option 7 was chosen



STRUCTURE

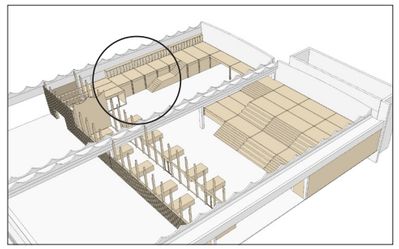
WORKSHOP

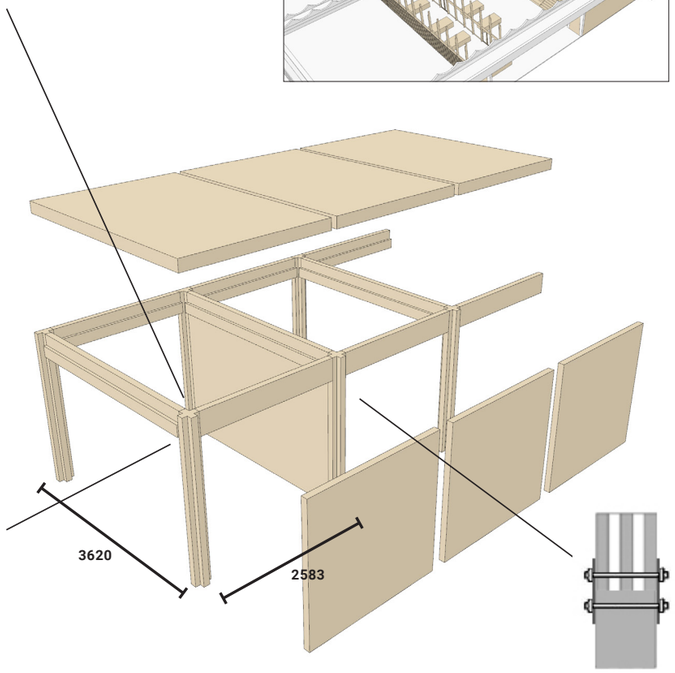
- The structure consists of laminated timber beams and columns and clt panels as floors and partition walls.
- The whole structure is prefabricated



DEMOUNTABLE STRUCTURE

- Every columns is cross-shaped.
- T-beams are connected to the columns with a bolted system. bolts are only visible on the beams.
- Because the t-beams make a frame, the rectangular clt floor panels can be positioned inside that frame.
- The floor panels leave clearage where the frame of the beams provide for a floor without gaps
- The beam system provides for uniform floor slabs and makes the structure easy repeatable
- CLT partition walls are bolted onto the columns





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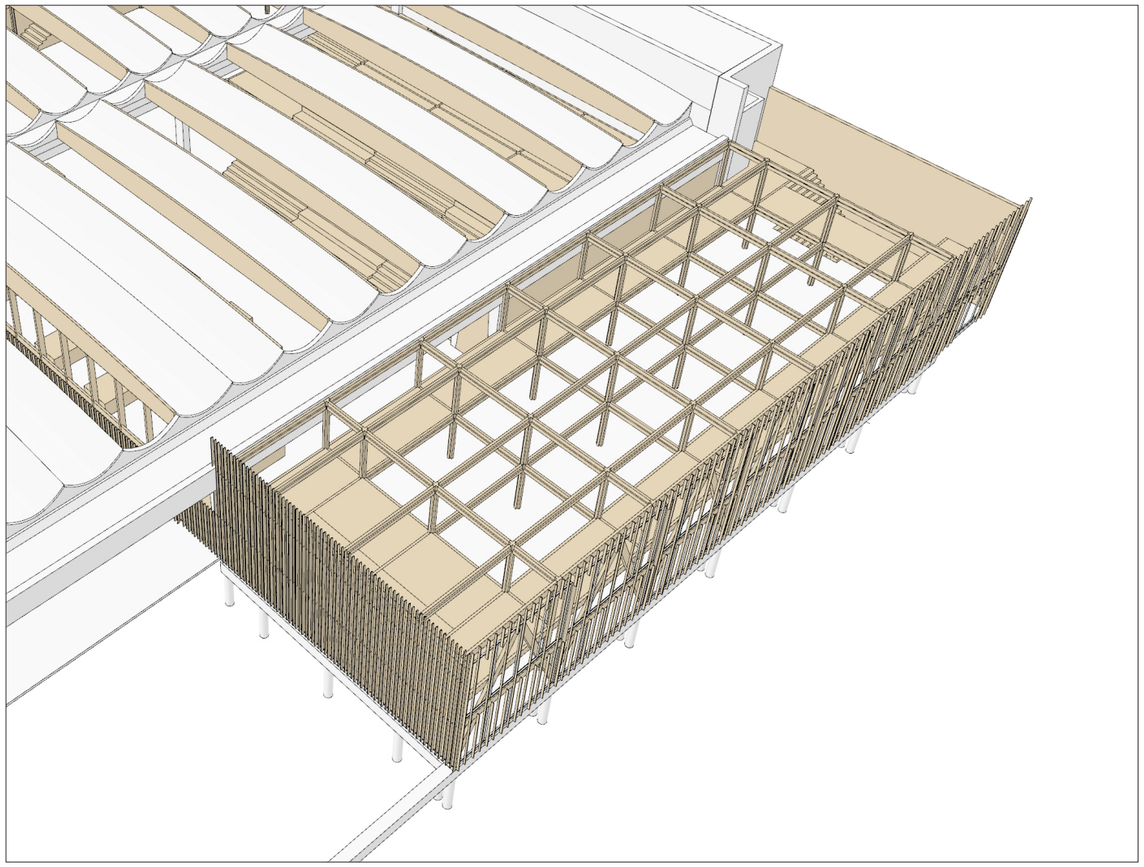

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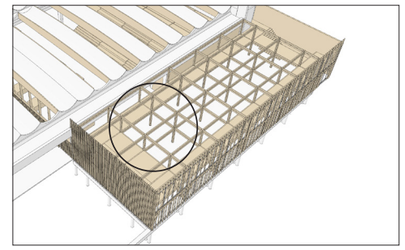
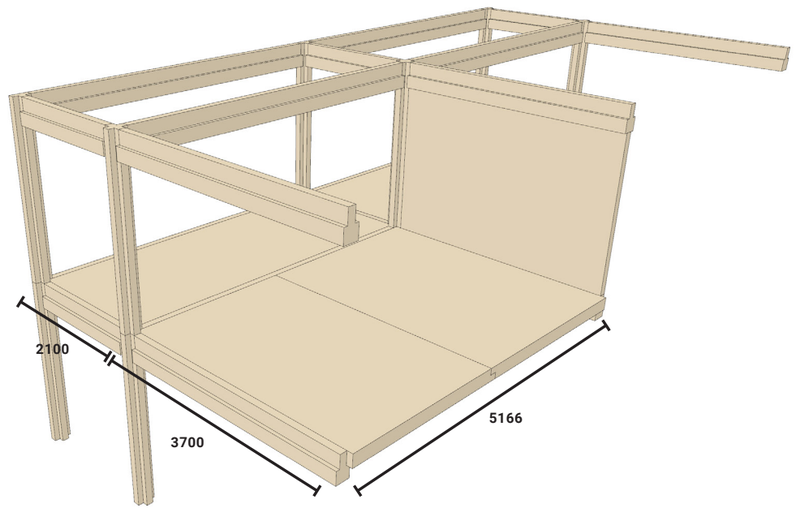
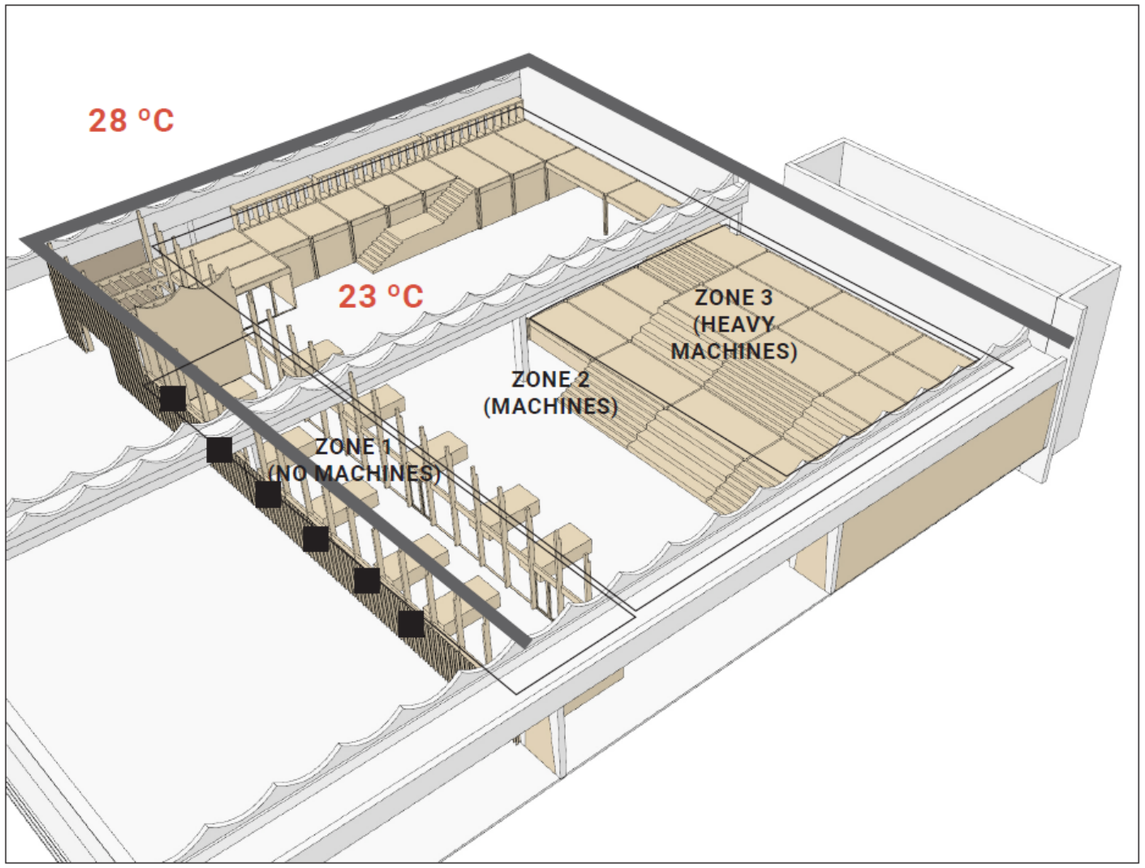




INSTALLATIONS

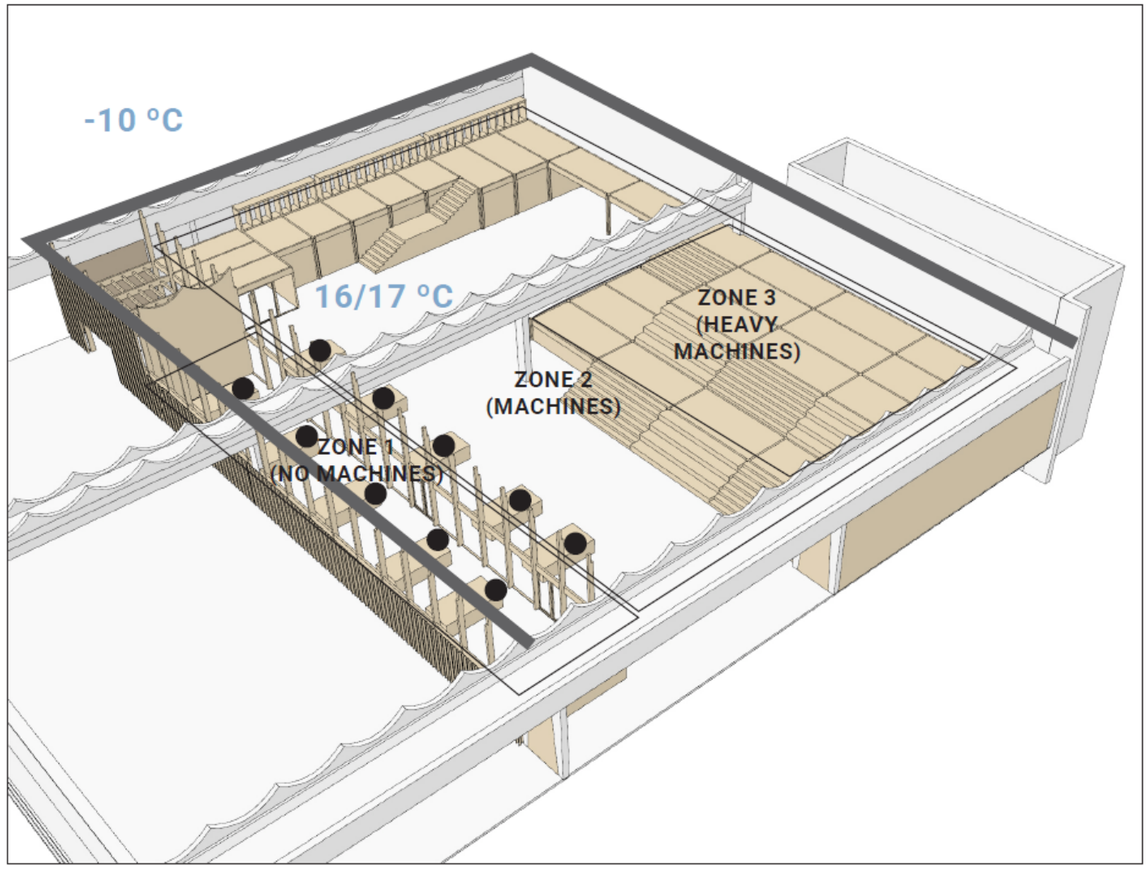
WORKSHOP - SUMMER

- The whole façade will be insulated
- The roof will be insulated where possible. also triple glazing will be used for the rooflights.
- There is a possibility to open the windows on the north side of the building, whereas this is not that favourable for the climate system. the idea is to give the user of the building more freedom.



WORKSHOP - WINTER

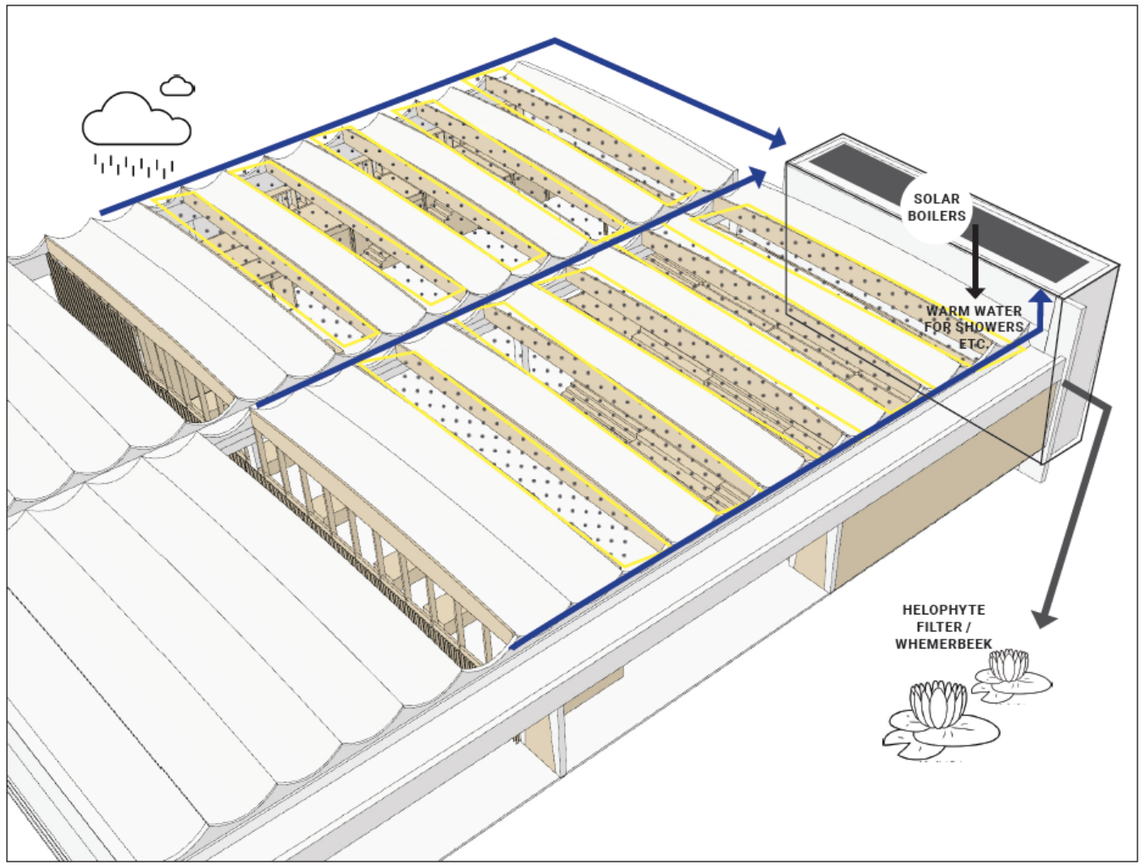
- The whole façade will be insulated
- The roof will be insulated where possible. also triple glazing will be used for the rooflights.
- The temperature can be relatively low, since physical labour will be done in the workshop
- Heat will be produced by infrared panels integrated in the work tables and the machiines itself.



INSTALLATIONS

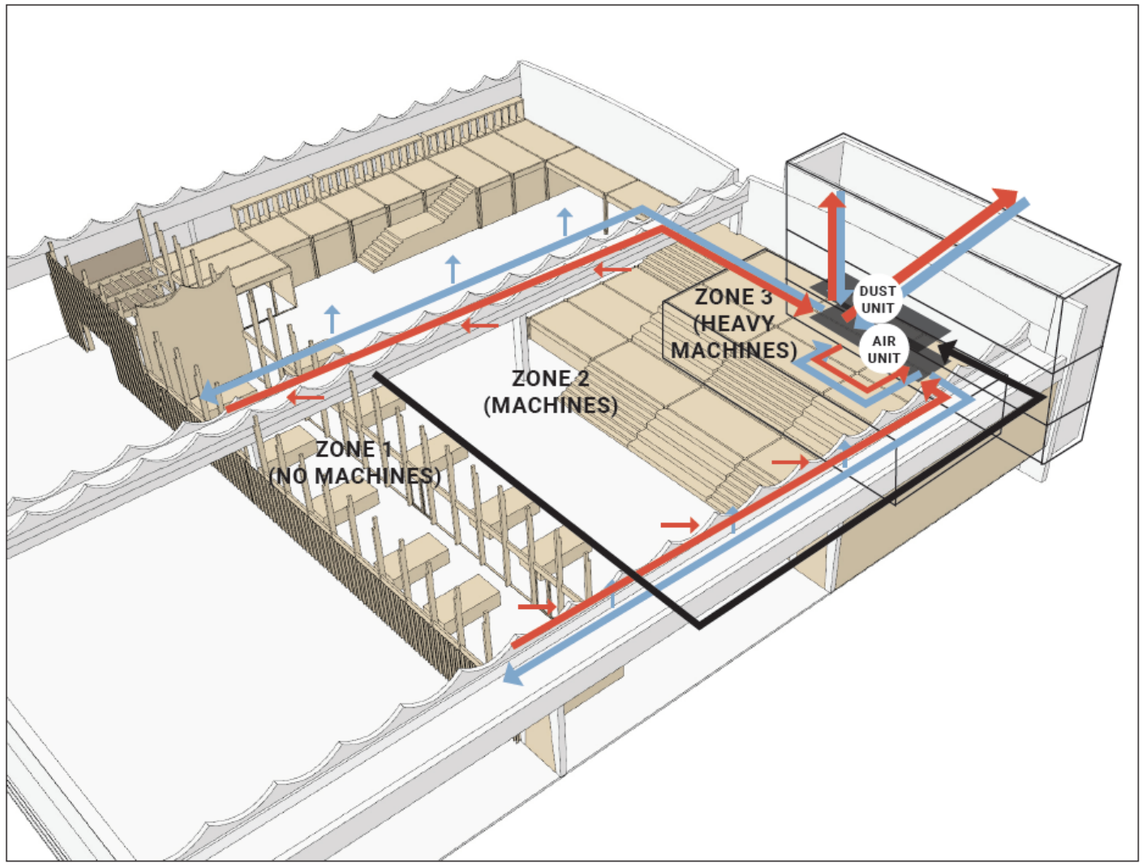
WORKSHOP - SYSTEMS

- Rain water is collected to be used into the grey water system
- Solar boilers on the roof of the side building provide for warm water
- Used grey water is let into the whemerbeek, where it is filtered by helophyte filters. this idea is feasible since the grey water system is not used that intensively.
- The glass of the new rooflights contain solar panels to provide for the energy demand of the workshop



WORKSHOP - VENTILATION

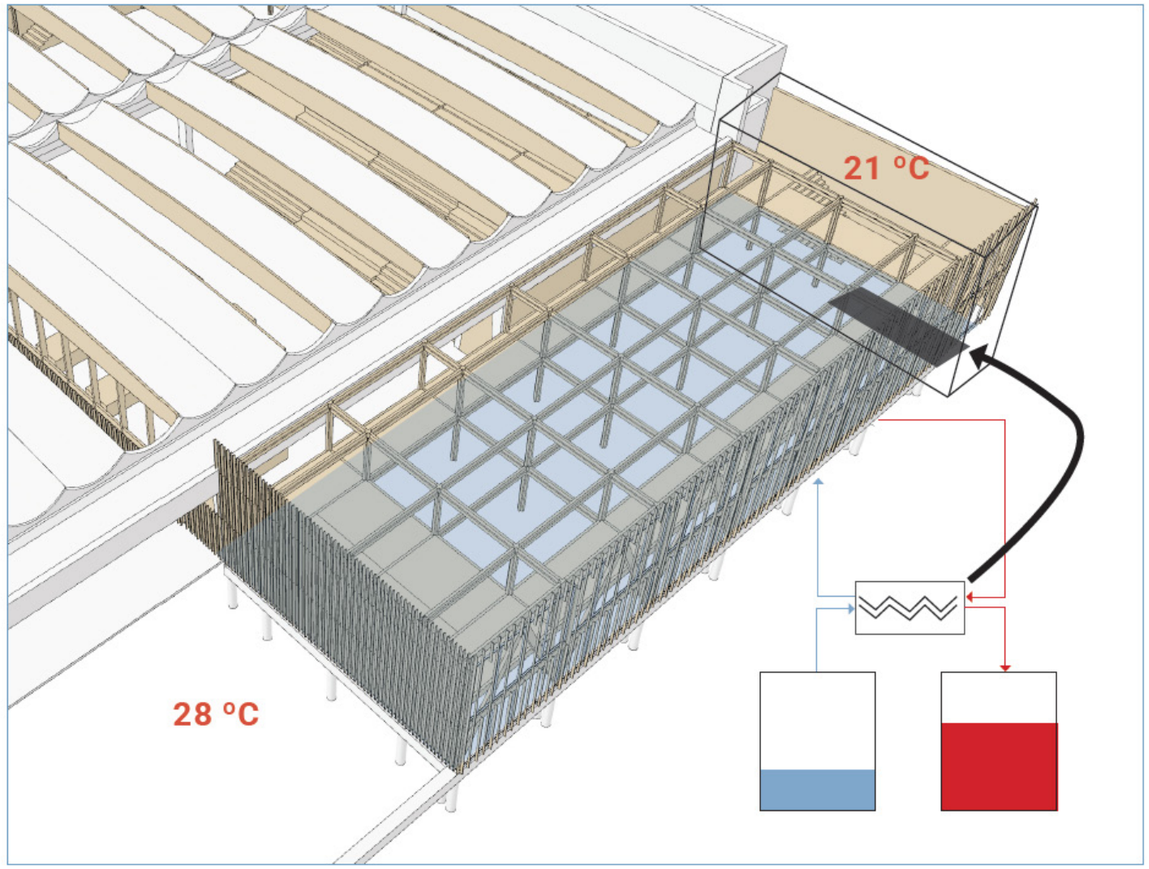
- Balance ventilation system
- The air unit is placdes in the basement of the side building, the dust unit is placded on the first floor of the side building
- Ventilation inlet from existing air ducts under teh floor
- Ventilation outlet also through existing air ducts under the floor
- Zone 3 has its own outlet and inlet
- Dust outlet from duct (hanging from ceiling) towards the dust unit
- Since all zones have different requirements, the ventilation/air demand has to be calculated for the different zones! Also the room where the dust unit is placed needs to be ventilated carefully!



INSTALLATIONS

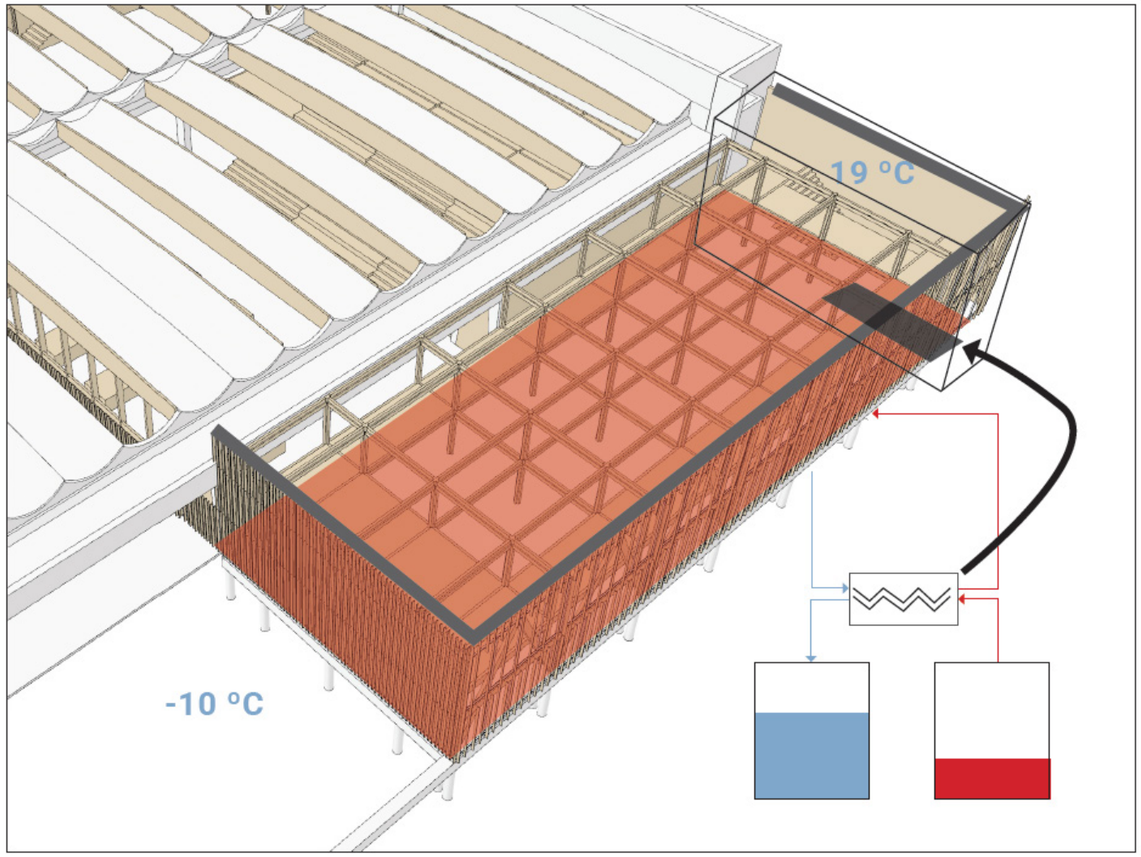
CREATIVE SPACES - COOLING (SUMMER)

- Since people will ‘work’ in this building, a lower temperature is desirable than present in the workshop area.
- Floor cooling of this part is connected to thermal energy storage.
- Installations are placed in the new basement of the addition



CREATIVE SPACES - HEATING (WINTER)

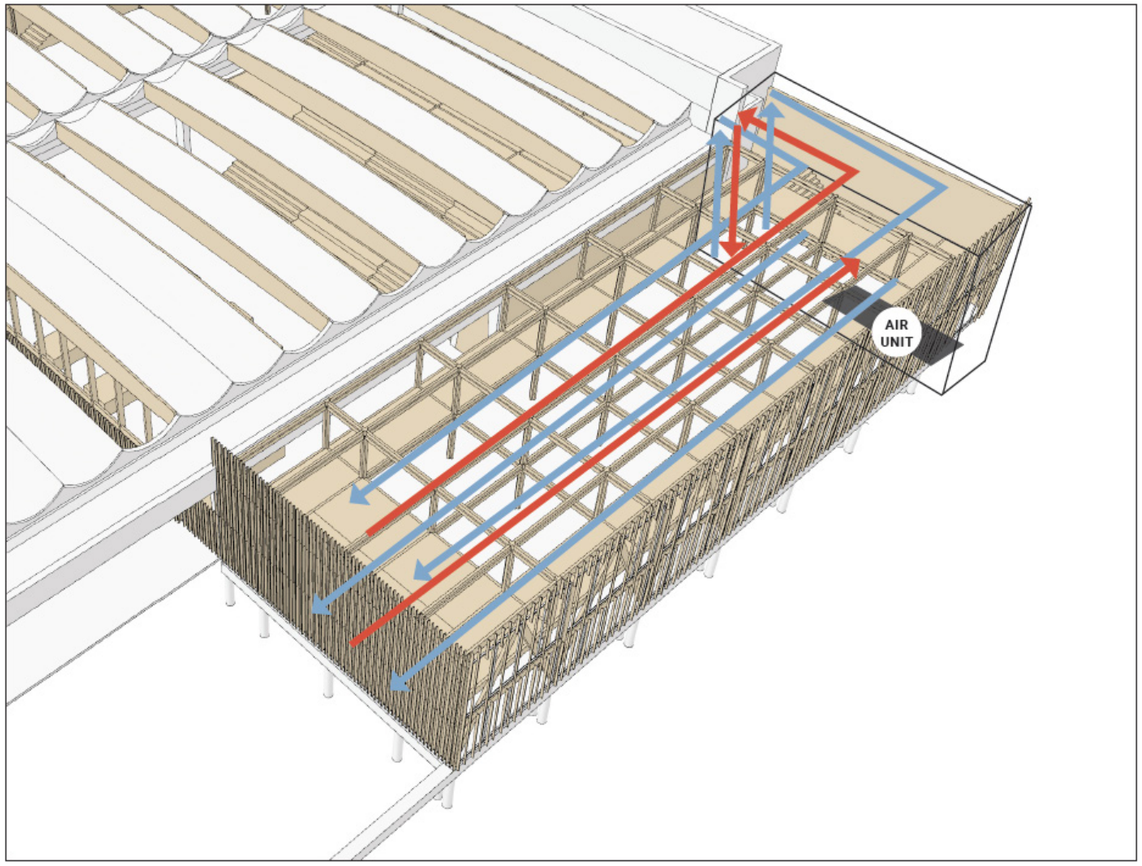
- Since people will ‘work’ in this building, a higher temperature is desirable than present in the workshop area.
- The addition will be insulated properly.
- Floor heating of this part is connected to thermal energy storage.
- Installations are placed in the new basement of the addition



INSTALLATIONS

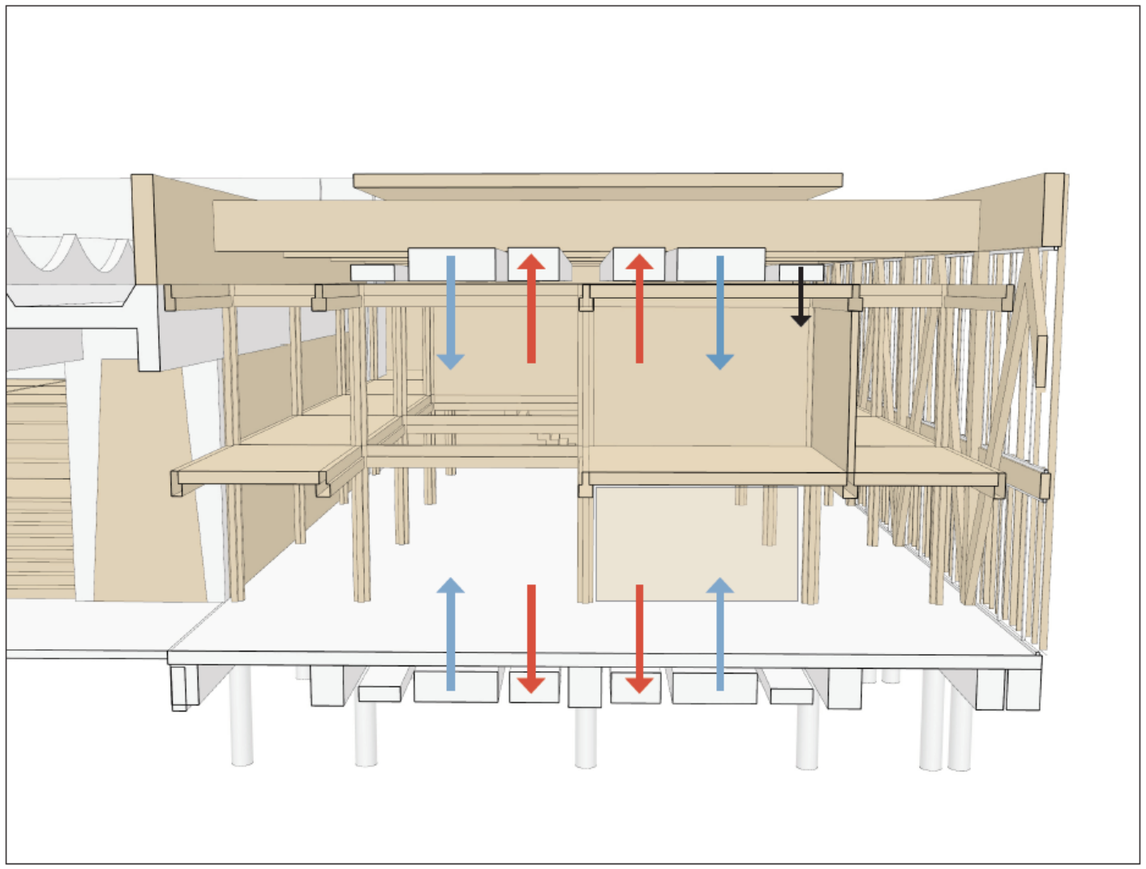
CREATIVE SPACES - VENTILATION

- Just under the roof and under the floor ventilation ducts are placed. they are the main ventilation system, separate cubicles can be connected to those.
- The air unit is placed in the basement of the side building



CREATIVE SPACES - GENERAL DUCT SYSTEM

- A general system of inlet and outlet of air is installed underneath the roof and floor.
- All cubicles can connect to the ventilation and energy system.



FUTURE SCENARIOS

PHASE 1

WORKSHOP:

- PEOPLE CAN 'RENT' TIMESLOTS FOR THEIR OWN PROJECTS
- THE ELEMENT CAN BE USED FOR SMALL LESSONS AND WORKSHOP INTRODUCTIONS
- PROJECTS CAN ALSO BE EXHIBITED ON THE ELEMENT

CREATIVE SPACES:

- NO RENTERS
- HALF OF STRUCTURE IS BUILT
- SMALL KITCHEN AND RELAX AREA
- BIG AREA, OPEN 'EXPERIMENT AREA'

SHEDS:

- EXHIBITION SPACE IS USED FOR LOCAL INITIATIVES
- FREE RENTABLE SPACE
- INDOOR MARKET PLACE

PHASE 2

WORKSHOP:

- PEOPLE CAN 'RENT' TIMESLOTS FOR THEIR OWN PROJECTS
- THE ELEMENT CAN BE USED FOR SMALL LESSONS AND WORKSHOP INTRODUCTIONS
- ARTISTS ARE WORKING ON THEIR PROJECTS

CREATIVE SPACES:

- SOME OF THE CUBICLES ARE RENTED OUT
- THE WHOLE STRUCTURE IS BUILT
- 'EXPERIMENT AREA' MOVES TO TOWER

SHEDS:

- A SMALL SHOP OPENS, ALSO WITH THE LOCAL INITIATIVES
- EXHIBITION CONSISTS OF HALF LOCAL INITIATIVES AND HALF ARTIST'S PROJECTS
- INDOOR MARKET PLACE

PHASE 3

WORKSHOP:

- ARTISTS ARE WORKING ON THEIR PROJECTS

CREATIVE SPACES:

- (ALMOST) ALL CUBICLES ARE RENTED OUT

SHEDS:

- SHOP COMPLETELY FOR ARTISTS
- EXHIBITION COMPLETELY FOR ARTISTS
- CLASSROOMS FOR EDUCATION AND WORKSHOPS

PHASE4

--> CREATIVE SPACES IN THE PARK
--> EXTENSION 'EXPERIMENT AREA'

TUTORING 19-03-2020

ARCHITECTURE:

- Does this wood communicate what is new or what is old? What is the role of the wood? Wood is added to create unity. Different pieces are recognizable because of the changes visible in the wooden skin.

- With the scenarios, think of a minimum starting point.
    - Is it flexible? What is the role of the addition?
    - The reasoning for the different scenarios needs to be better, what is the 'motor' of the project?
    - Call the renters entrepreneurs, not artists (they always cost money)
    - What is necessary to start the first phase, what building and what installations/elements

- How about investments? How is the one situation going to be as prosperous to be able to invest in the next phase?

- Try to see if you can move functions around, maybe start at the last phase and work from there backwards.

BUILDING TECHNOLOGY:

- The demountable structure does not have to be attached to the building

- Depending on the weight of the structure, there can be calculated whether the structure needs to have a foundation. The load on the tamp-concrete needs to be researched for this (it cannot hold pull tension, only pressure)

- The energy systems have to be as sustainable as possible. Draw 3 energy schemes (2 summer/winter heat and 1 ventilation). Try to connect these schemes together.

- Try to see if you can connect both parts to a thermal heat storage in the ground (Winterswijk is suitable for this type of energy storage). You need to come up with something to gain the heat which the sun creates in summertime to store it in the ground for reusage.

- Check Klimapedia for smart systems

- Creative spaces: where are people working? What happens when there are no people / what happens when there are people present in the units?
    - Try to draw multiple options for this. Make simple schemes

- It is important to know how air flows through your building, draw this in diagrams

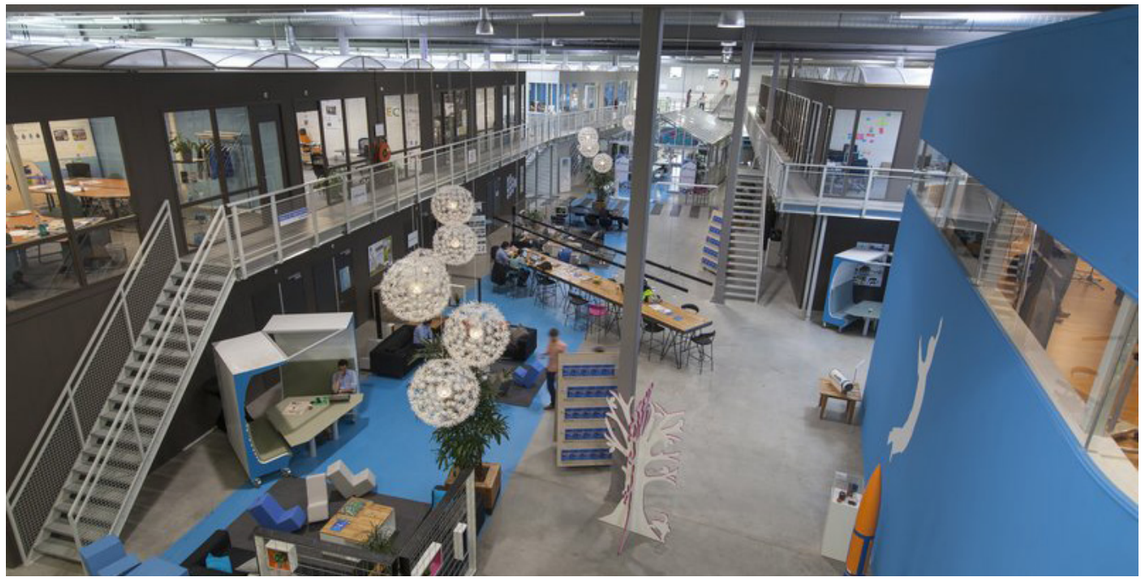
TIMBER TOWN

19-03-2020

PRECEDENTS CREATIVE SPACES

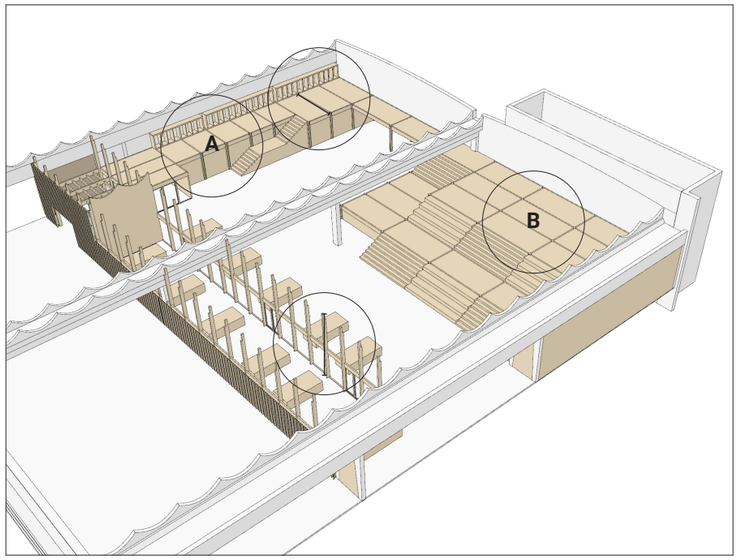
FUNCTIONAL - YES DELFT, DELFT

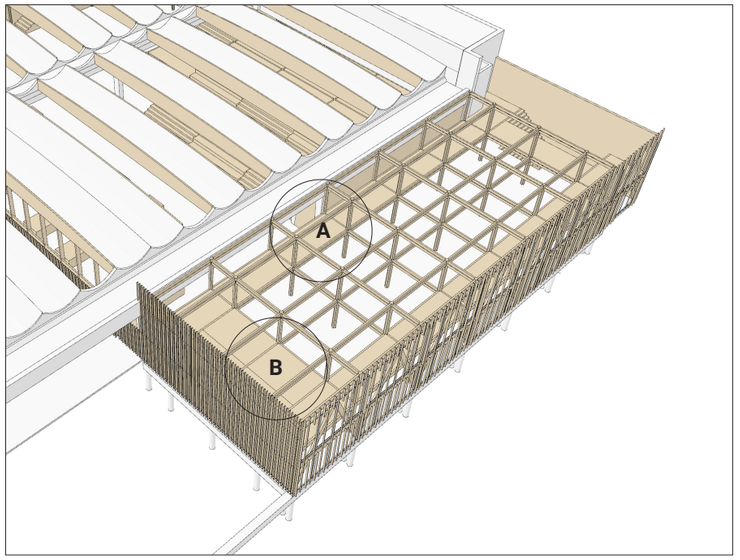
- An incubator for start-ups. Every start-up has its own office, which is either situated on the ground floor or one floor up.
- The ‘street’ downstairs provides a ‘public space’ where all companies can meet, relax and eat.



STRUCTURE CALCULATIONS

TIMBER WORKSHOP AND CREATIVES SPACES





Maximum span beam = 5,45 m
Laminated timber beams: h = 1/15*l

Height = 1/15*5,45 = 0,36 m
Width = 1/8*0,36 = 0,06 m (0,1 chosen)

Maximum height column = 5,7 m
(Laminated) timber columns: w = 1/22*h

Width = 1/22*5,7 = 0,26 m

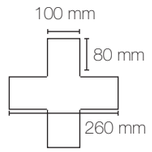
Dimensions CLT floor A = 3,6 m * 2,5 m
Dimensions CLT floor B = 5,45 m * 2,5 m

CLT floor slabs for maximum span of 5,45 m (from CrossLam®, 175E > 5 times 35 mm layers) 175 mm + 5 mm finish = 180 mm thickness of panels

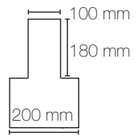
Maximum span beam = 4,9 m

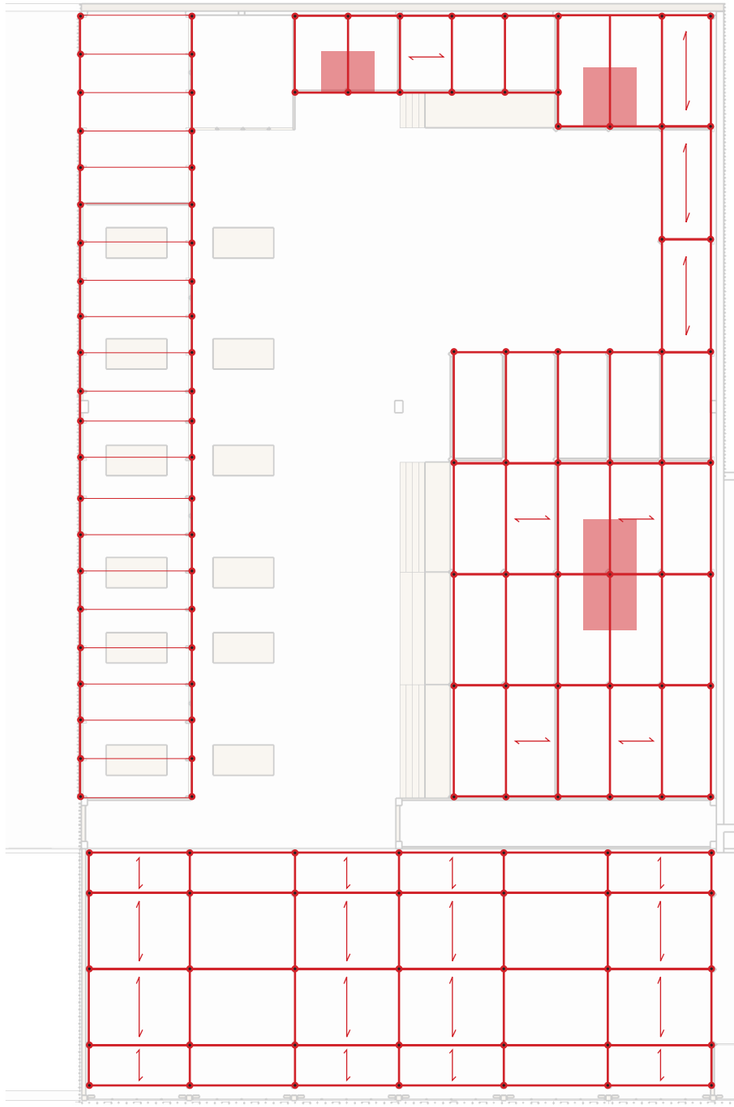
Dimensions CLT floor A = 5 m * 2 m
Dimensions CLT floor B = 2,3 m * 3,6 m

Cross shaped columns
0,26*0,26 m =
0,26*0,1 + 2*0,08*0,1
= 0,042 m²



T shaped beams
0,36*0,2 m =
0,36*0,1 + 2*0,05*0,18
= 0,054 m²





1. Weight of the column itself
2. Load on the column (structure)
3. Permanent loads
4. Variable loads

Laminated timber: 500 kg/m³
CLT: 450 kg/m³

1.
0,042*2,6m=0,1029 m³
0,1029*500=51,45 kg

2.
Floor B = 5,45 m * 2,5 m = 13,6 m²
13,6*0,18 = 2,45 m³
2,45 * 450 = 1102,5 kg

Beams B = 5,45 m and 2,5 m = 7,95 m
0,054*7,95m=0,4293 m³
0,4293*500=214,65 kg

3.
500 kg (tables/furniture/art pieces)

4.
Variable load of 3 kN/m²
3*13,6 = 40,8 kN = 40800 N = 4080 kg

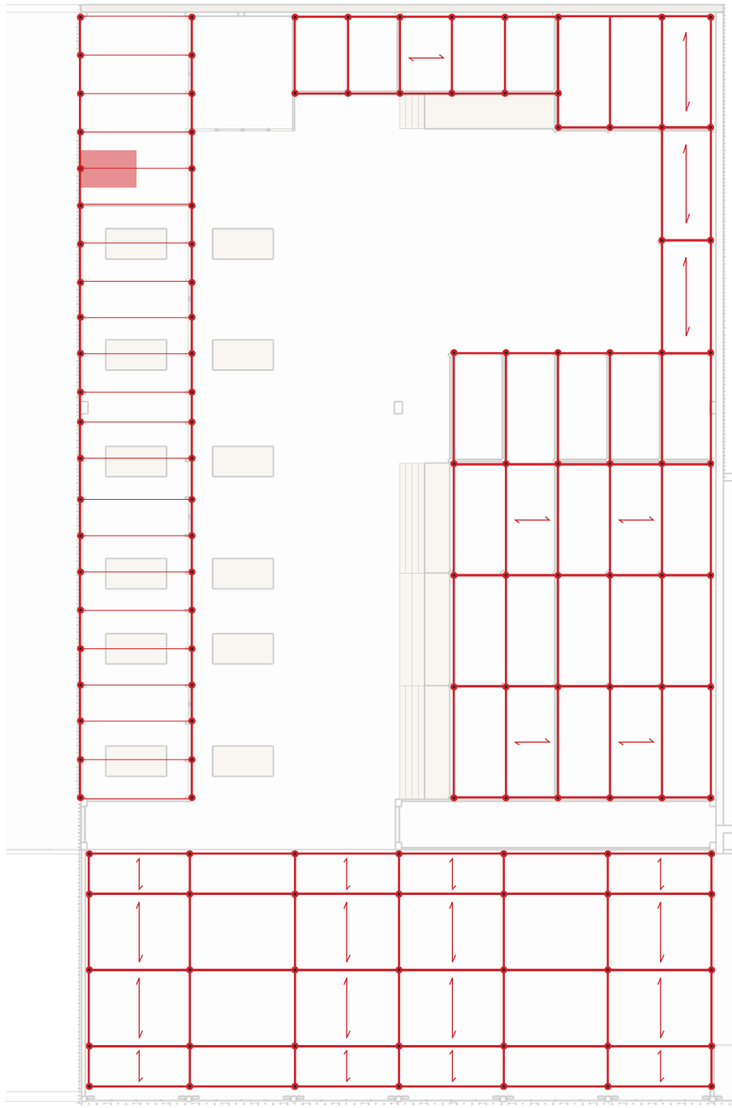
Pointload of 5948,6 kg = 59486 N
= 59,486 kN

0,042 m² = 42000mm²
59486/42000 = 1,42 N/mm²

Tamp-concrete has a strength class of C12/15 which means 12 N/mm² cilinder pressure strength and 15 N/mm² cube pressure strength

STRUCTURE CALCULATIONS

TIMBER WORKSHOP AND CREATIVES SPACES



1. Weight of the column itself
2. Load on the column (structure)
3. Permanent loads
4. Variable loads

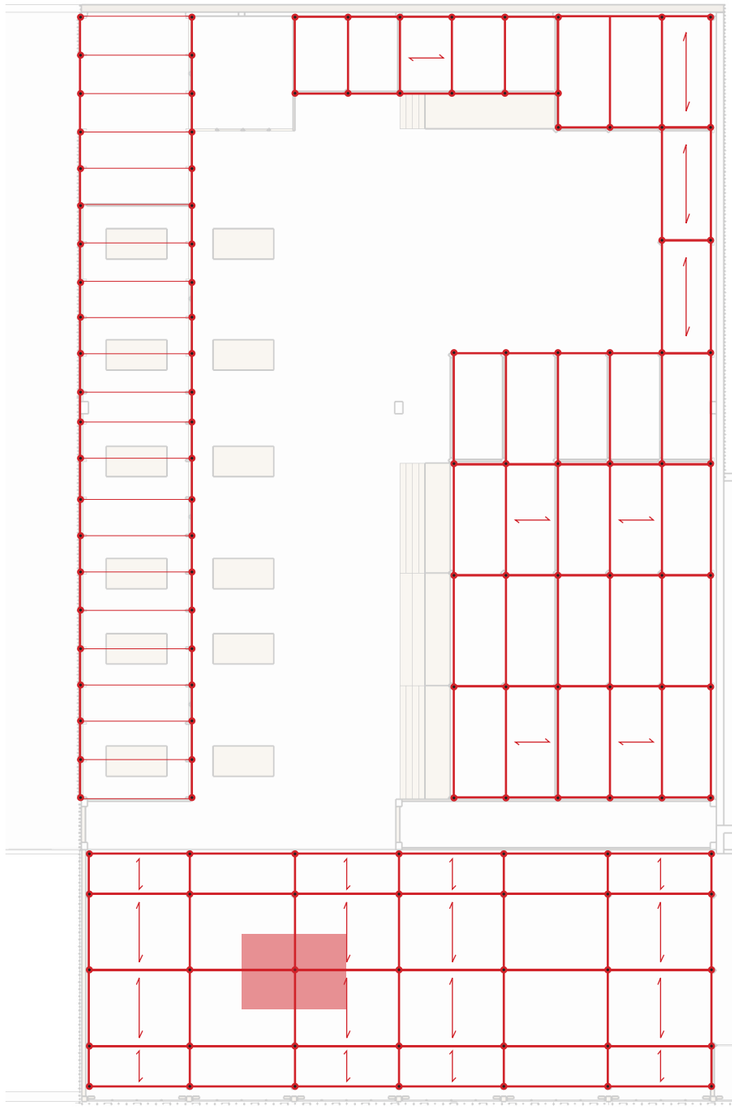
Laminated timber: 500 kg/m³
Timber:: 1500 kg/m³

1.
0,26*0,1*5,7m=0,15 m³
0,15*500=74,1 kg

2.
Beams B = 1,75m*0,026 = 0,046 m³
0,046* = 22,75 kg * 2 = 45,5 kg

Façade = 10 vertical timber slats
0,1*0,025*5,7=0,014
0,014*1500 = 21,4 kg

Pointload of 141 kg = 1410 N
= 1,41 kN



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2. Load on the column (structure)
3. Permanent loads
4. Variable loads

Laminated timber: 500 kg/m³
CLT: 450 kg/m³

1.
0,042*2,6m=0,1029 m³
0,1029*500=51,45 kg * 2 = 102,9 kg

2.
Floor B = 2,3 m * 3,6 m = 8,28 m²
8,28*0,18 = 1,49 m³
1,49 * 450 = 670,5 kg * 2 = 1341 kg

Beams B = 2,3 m and 3,6 m = 5,9 m
0,054*5,9m=0,3186 m³
0,3186*500=159,6 kg * 2 = 318,6 kg

Walls = 4,9 m * 2,24 m and 3,44 m * 2,24 m = 11 m² and 7,7 m²
11*0,1*450=495 kg and 346,5 kg
495*2= 990 kg and 346,5*2=693 kg

3.
500 kg (tables/furniture/art pieces)

4.
Variable load of 3 kN/m²
3*8,28 = 24,84 kN = 24840 N = 2484 kg

Pointload of 6429,5 kg = 64295 N
= 64,3 kN

0,042 m² = 42000mm²
64295/42000 = 1,53 N/mm²

CLIMATE/INSTALLATIONS

TIMBER WORKSHOP - WINTER

-10 ºC

Solar cells
in the new roof
lights provide
for electricity for
installations

Solar collectors
(boilers)
provide for heat
which is transported
to the thermal
storage

16/17 ºC

Existing façades
and roof shells
will be insulated

Infrared panels
for local
heating

Dust
unit

Air
unit

2 m

1,7 m

Pre-heating
the ventilation
air with thermal
storage

CLIMATE/INSTALLATIONS

TIMBER WORKSHOP - SUMMER

28 ºC

Solar cells
in the new roof
lights provide
for electricity for
installations

Solar collectors
(boilers)
provide for heat
which is transported
to the thermal
storage

Windows of the
north façade are
operable

22/23 ºC

Dust
unit

Air
unit

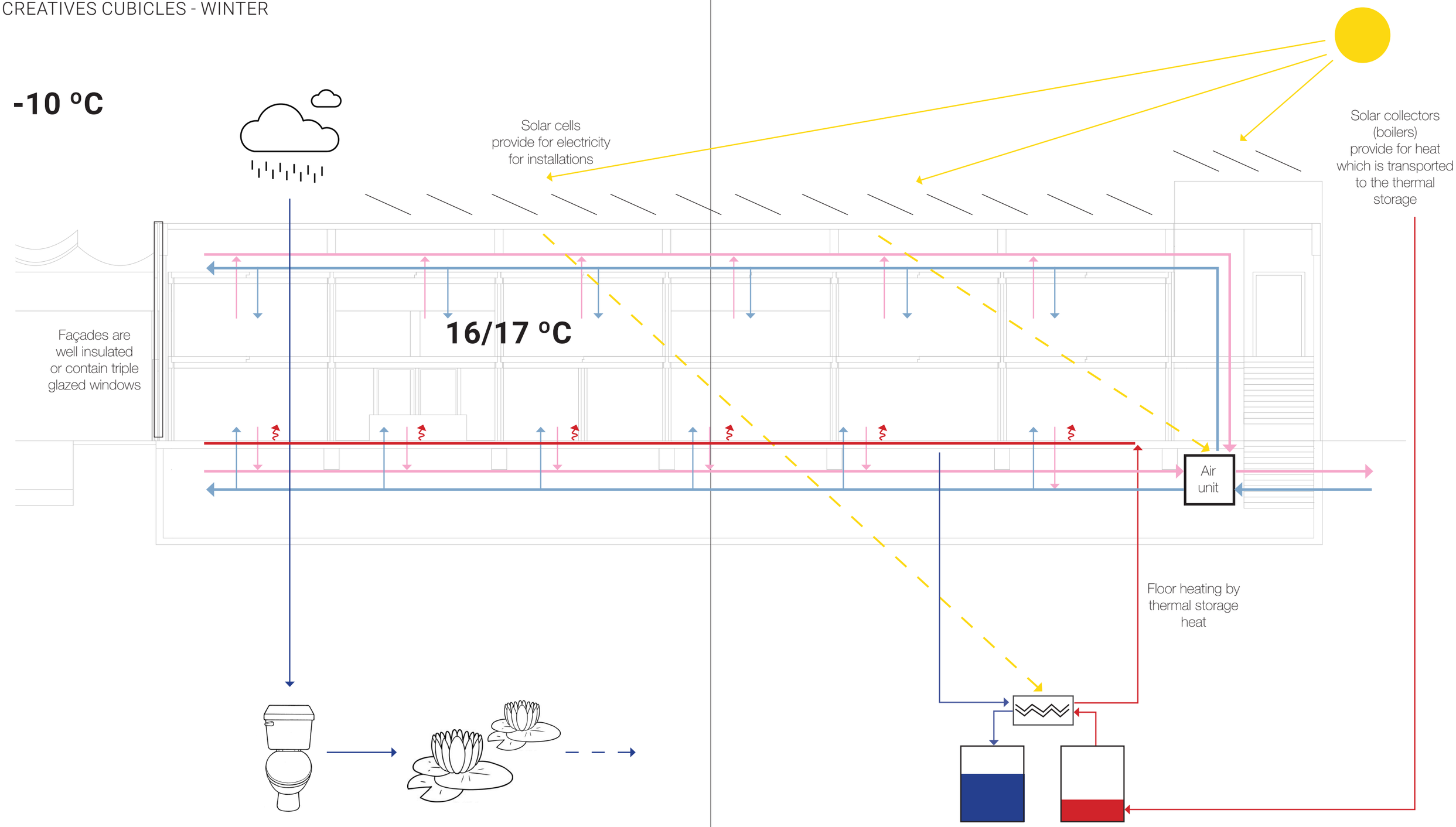
2 m

1,7 m

Pre-cooling
the ventilation
air with thermal
storage

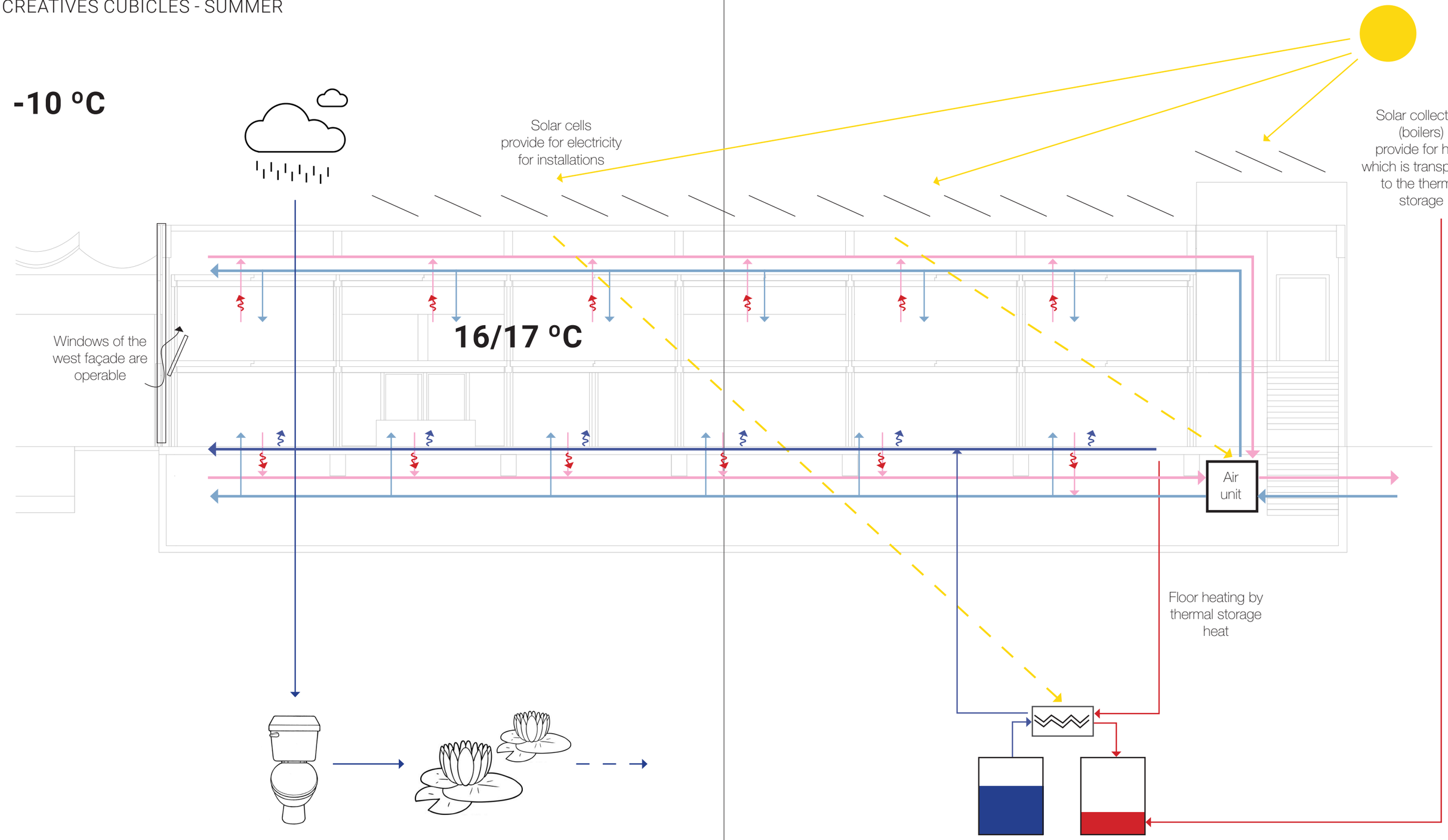
CLIMATE/INSTALLATIONS

CREATIVES CUBICLES - WINTER



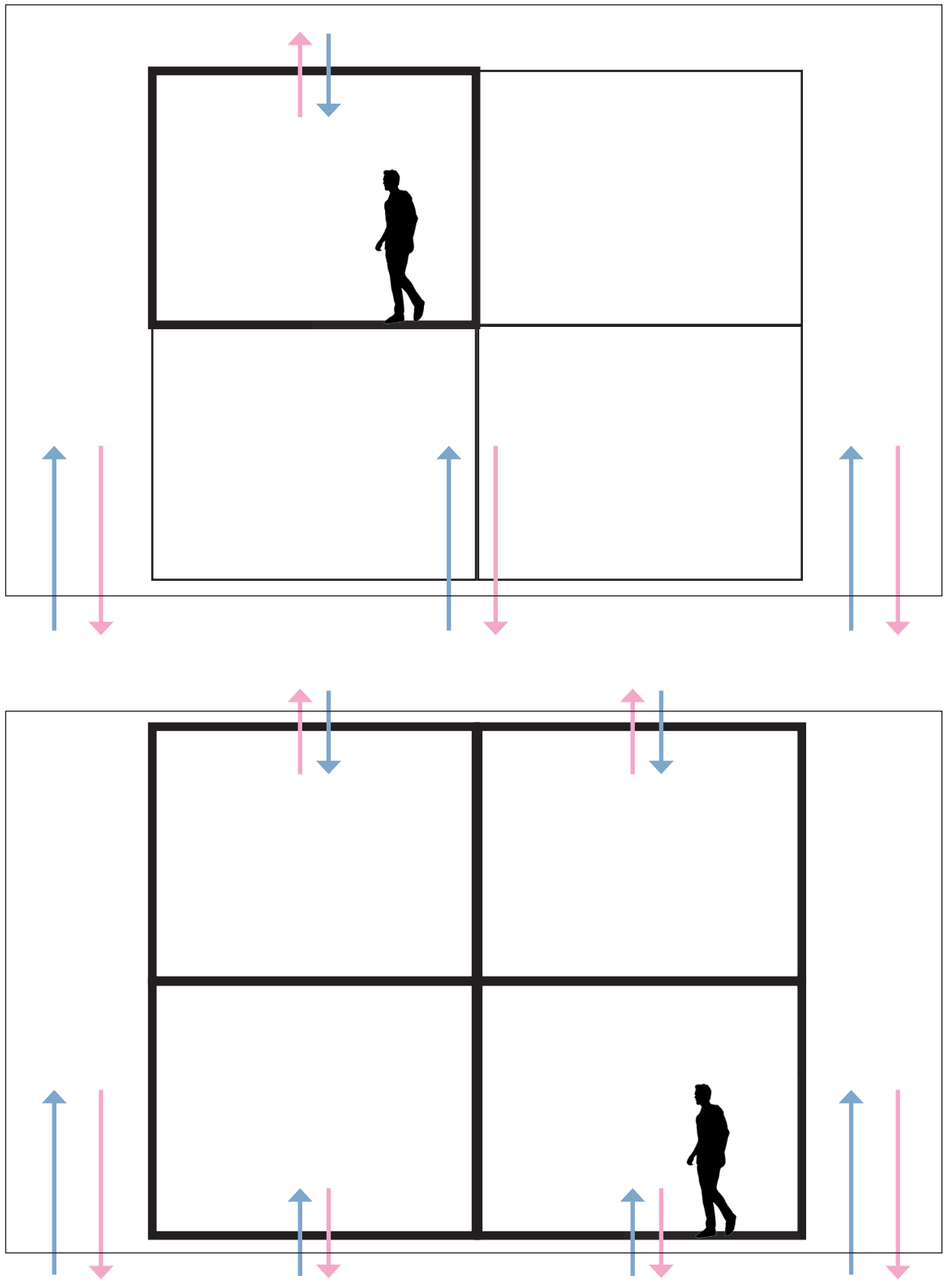
CLIMATE/INSTALLATIONS

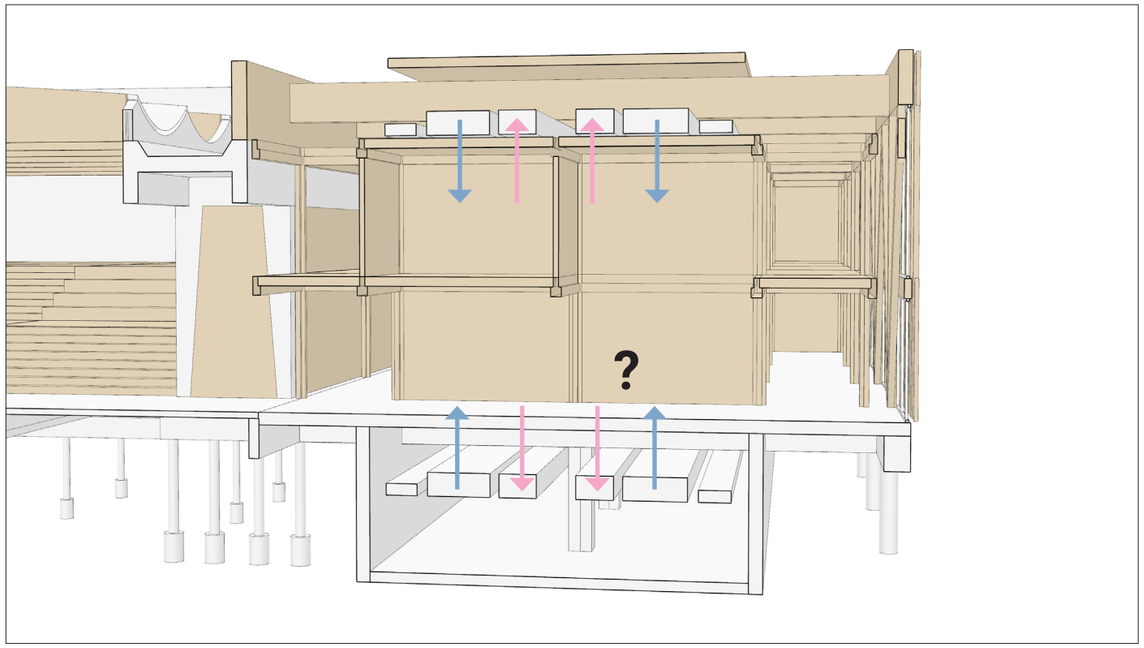
CREATIVES CUBICLES - SUMMER

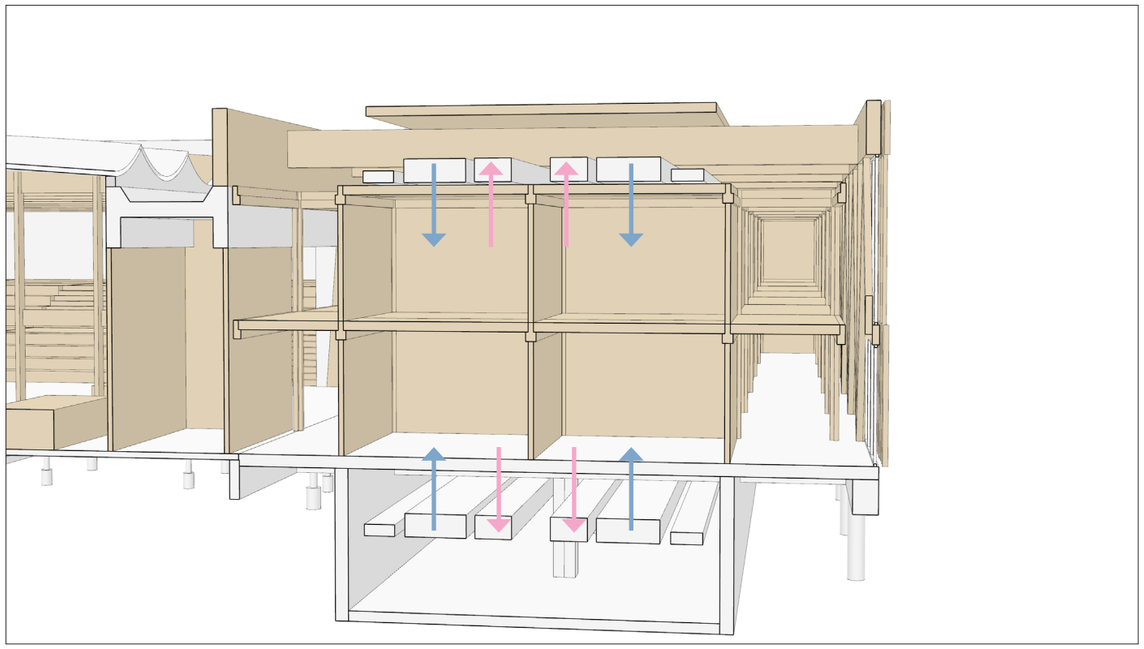


CLIMATE/INSTALLATIONS

CREATIVE CUBICLES

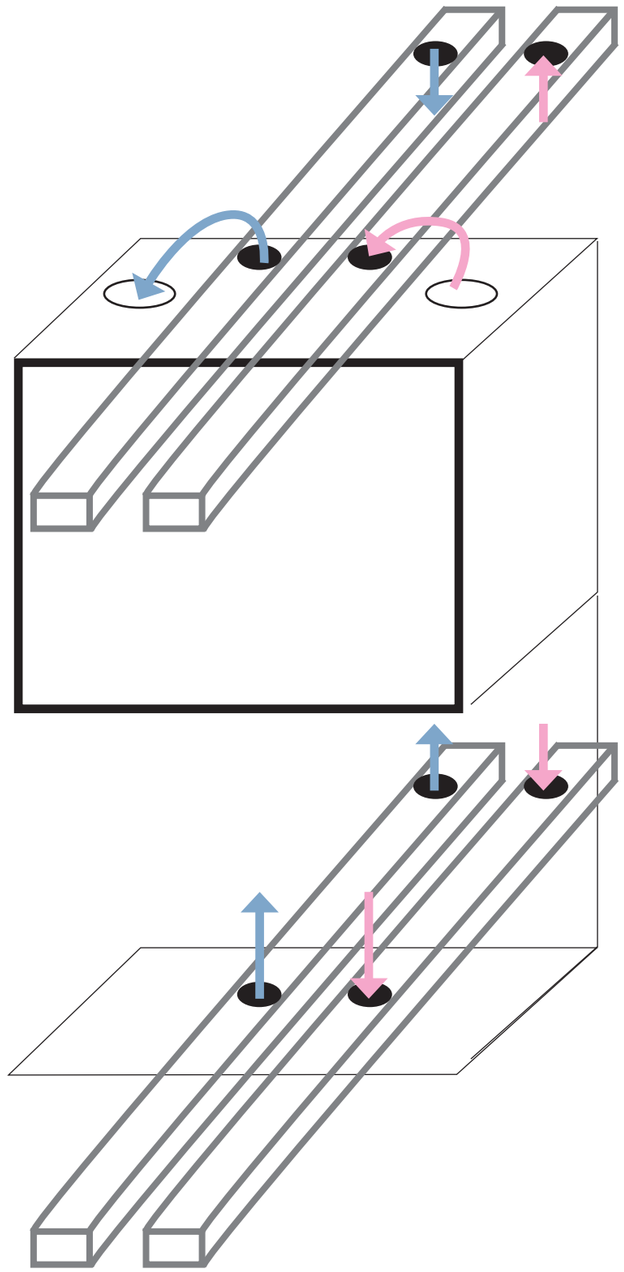




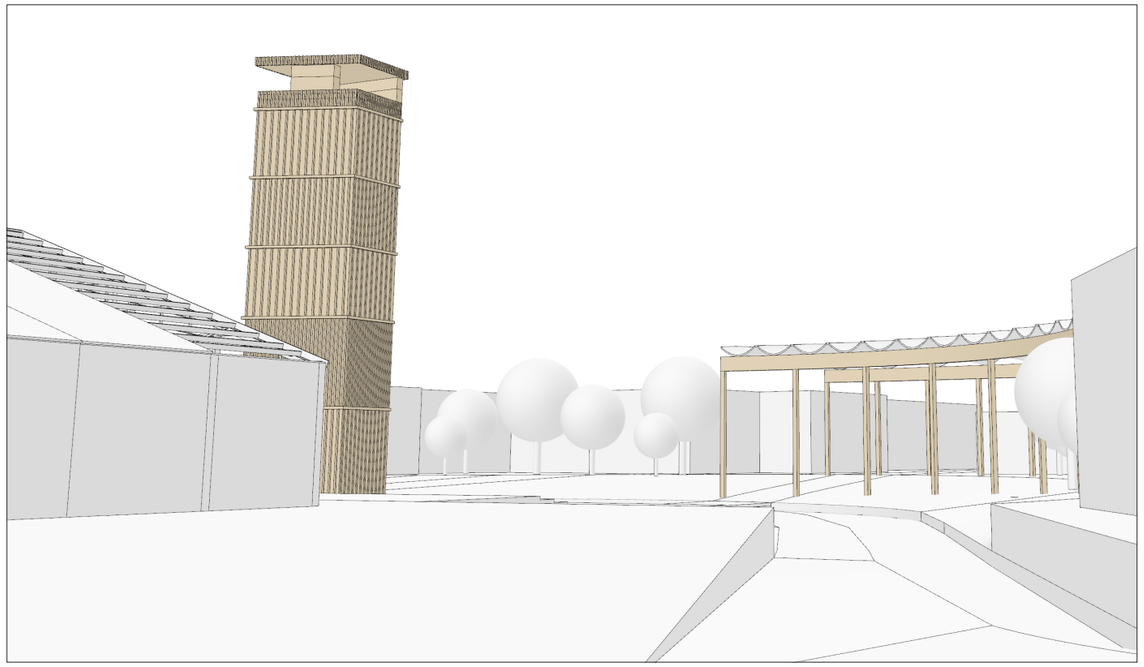


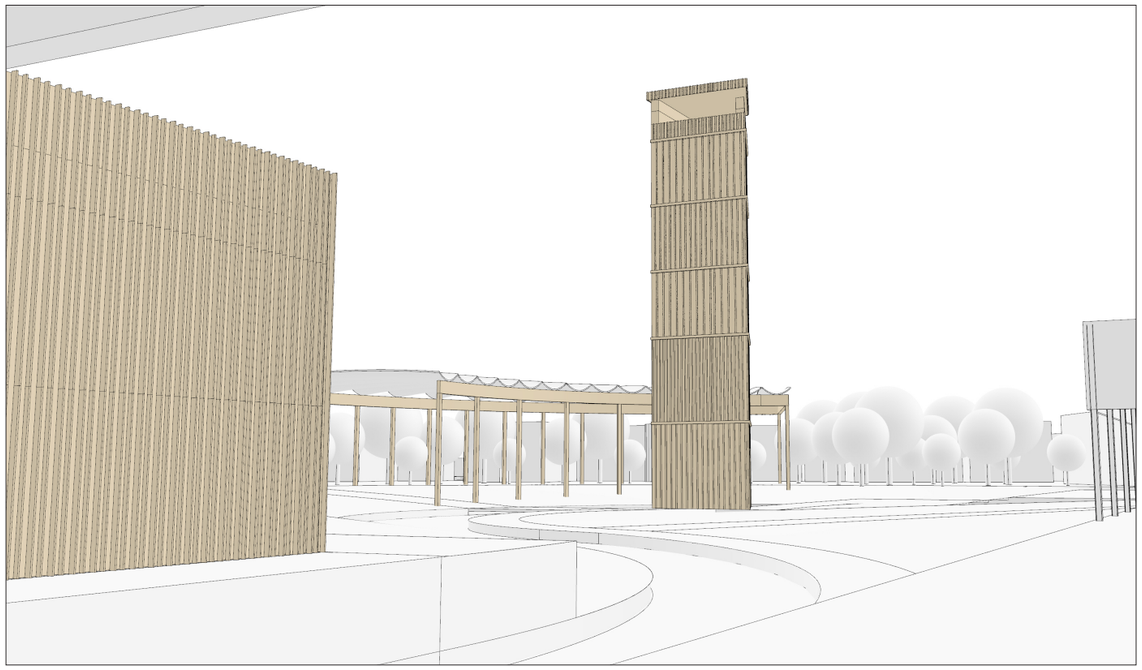
CLIMATE/INSTALLATIONS

CREATIVE CUBICLES



THE PAVILLION

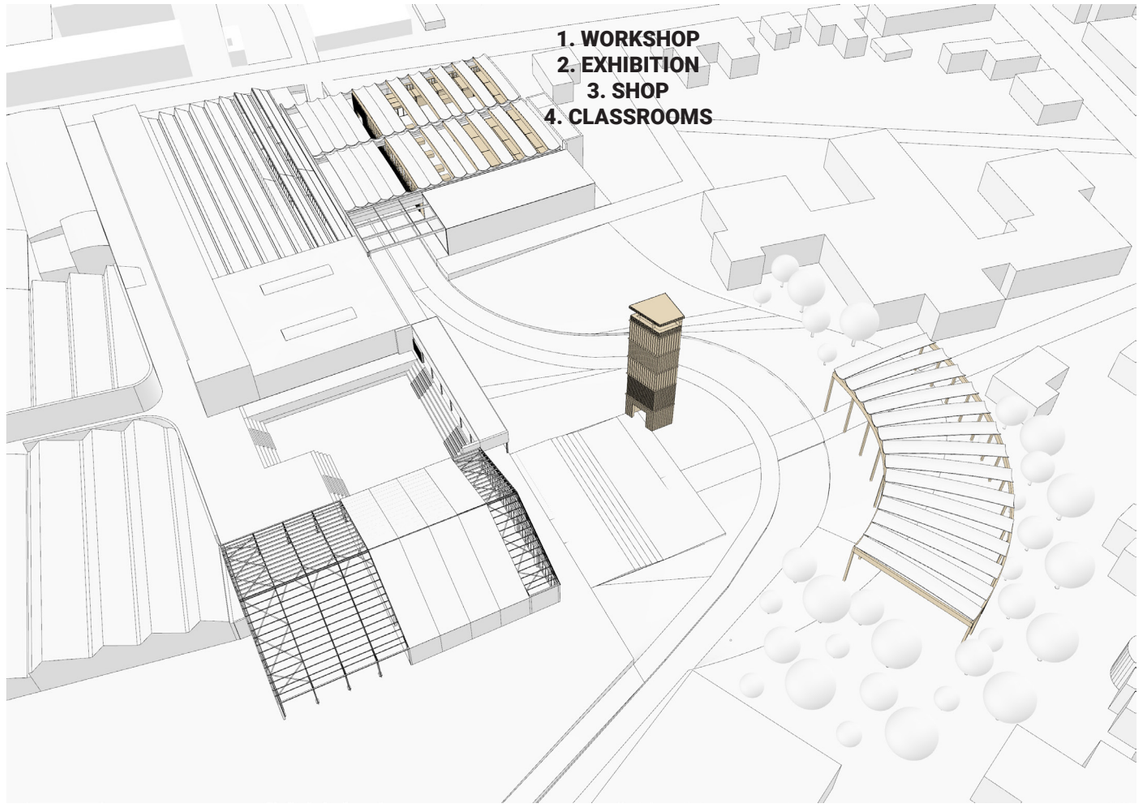




SCENARIOS

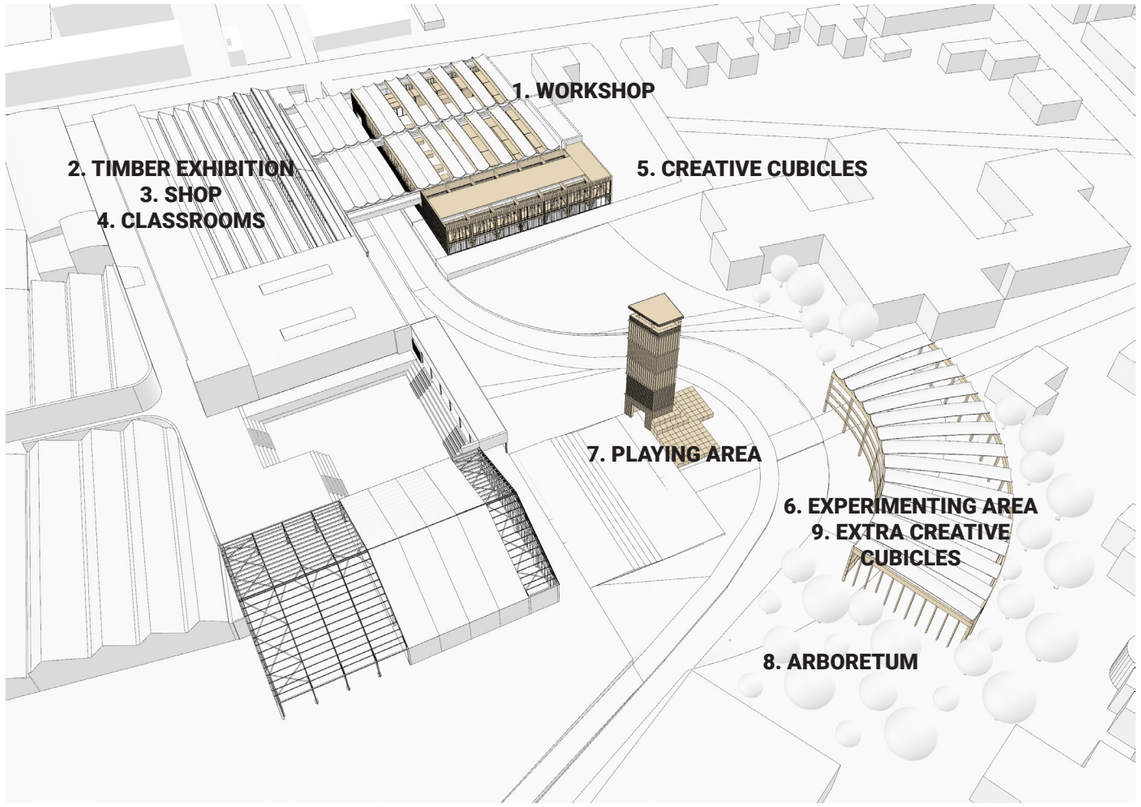
MINIMUM PHASE

1. Workshop
2. Exhibition
3. Shop
4. Classrooms



MAXIMUM PHASE

1. Workshop
2. Exhibition
3. Creative cubicles
4. Shop
5. Classrooms
6. Experimenting area
7. Playing area
8. Arboretum
9. Extra creative cubicles



SCENARIOS

PHASE 1

1. Workshop
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7. Playing area
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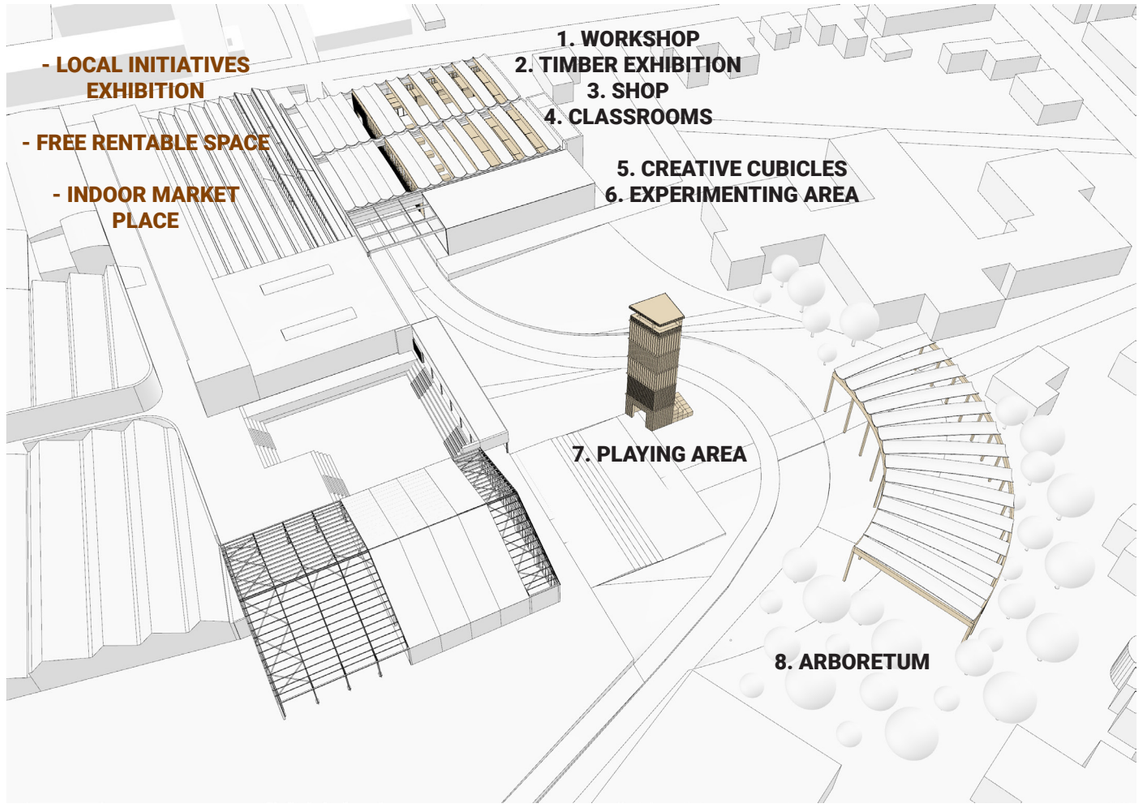

PHASE 2

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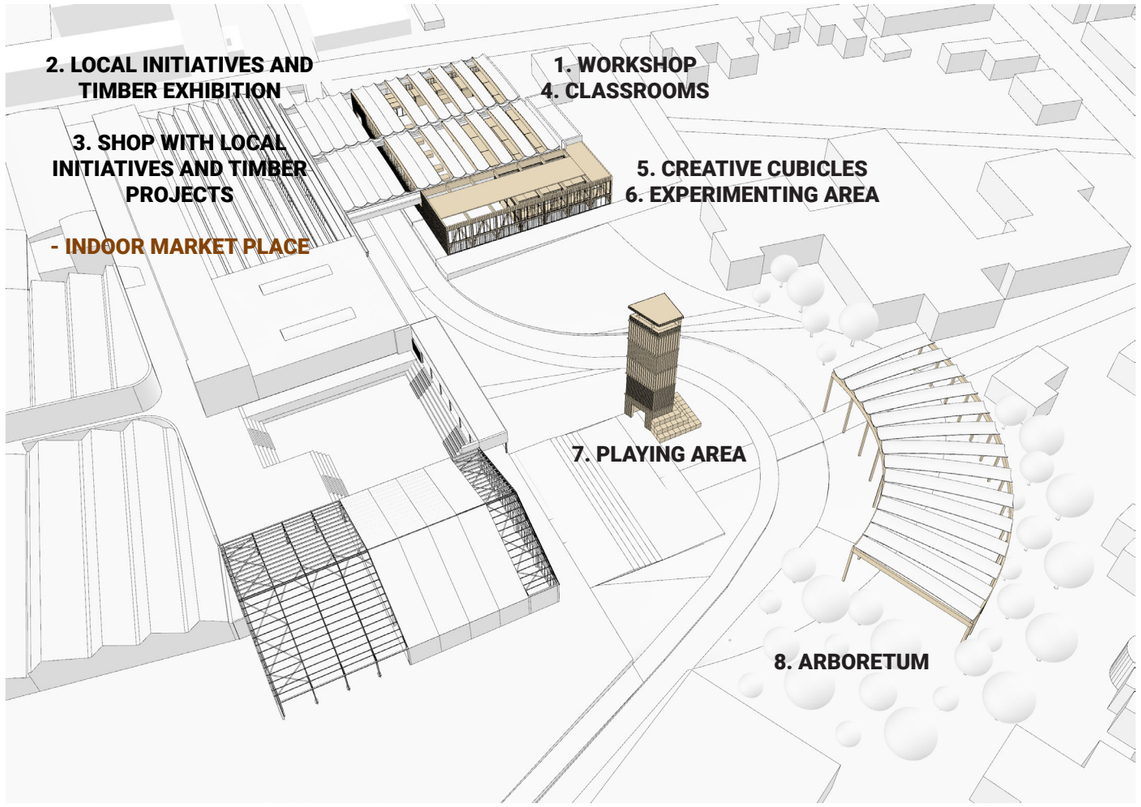

SCENARIOS

PHASE 3

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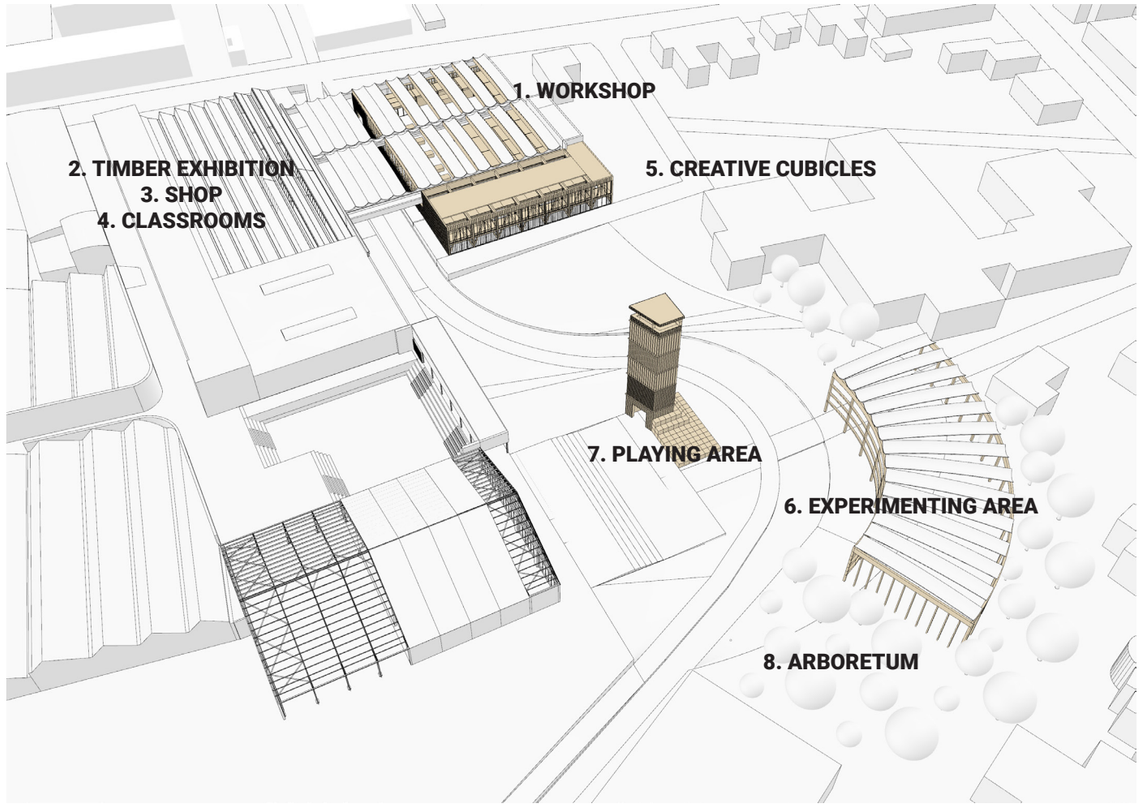

PHASE 4

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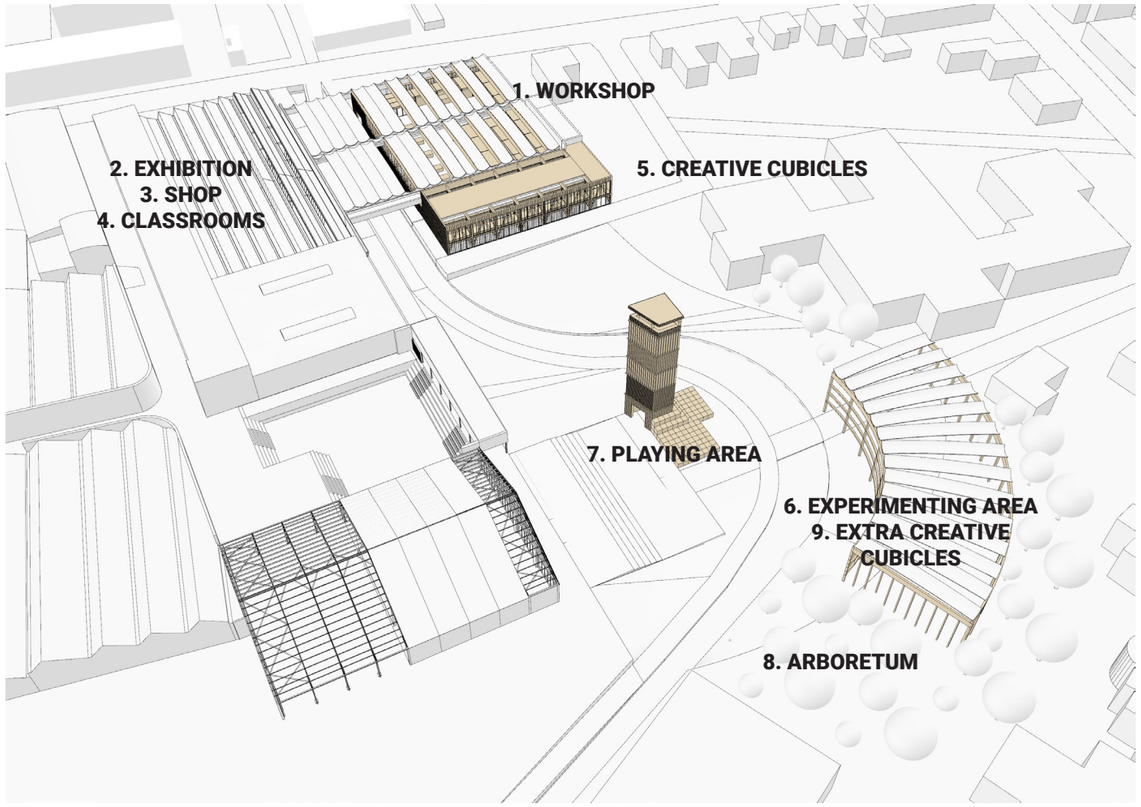
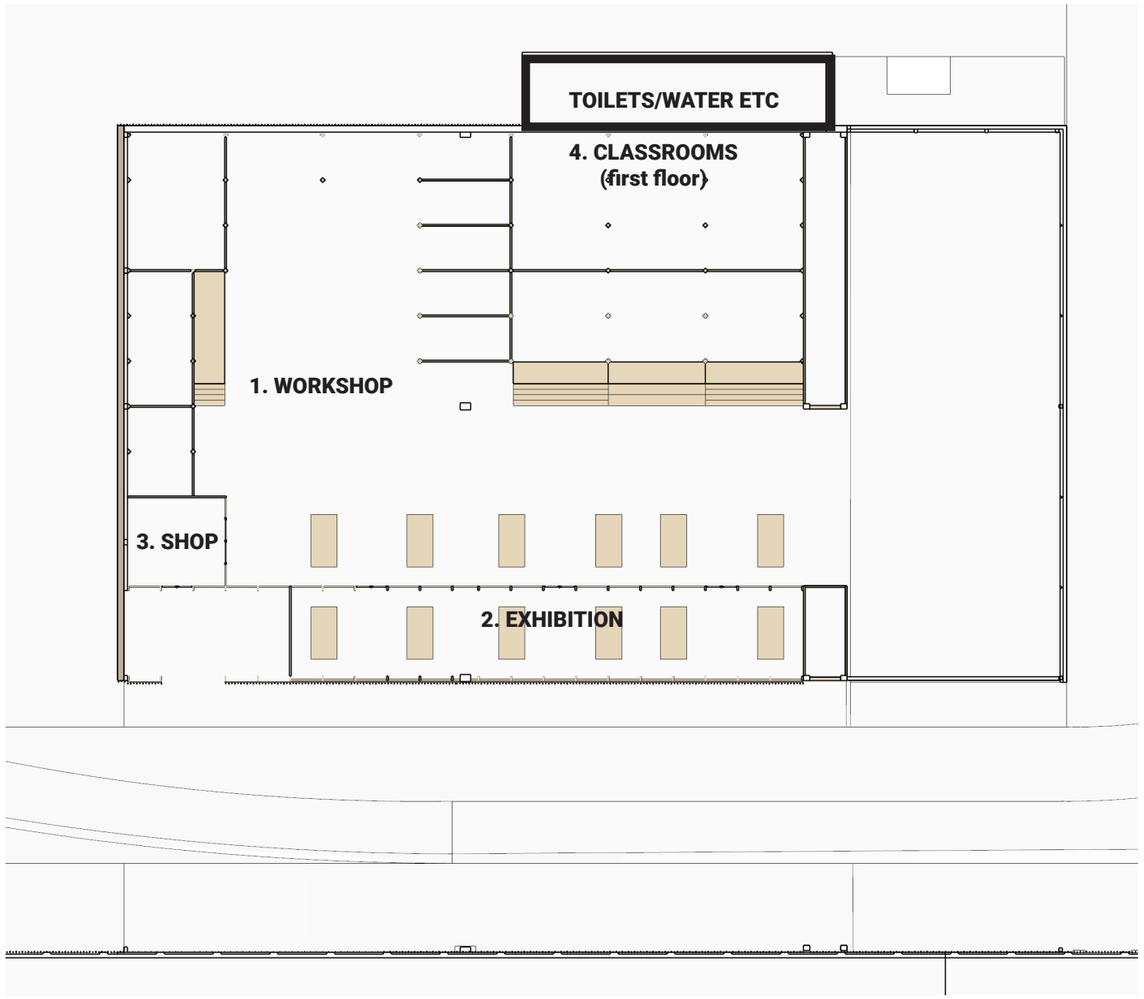
7. Playing area
8. Arboretum
9. Extra creative cubicles

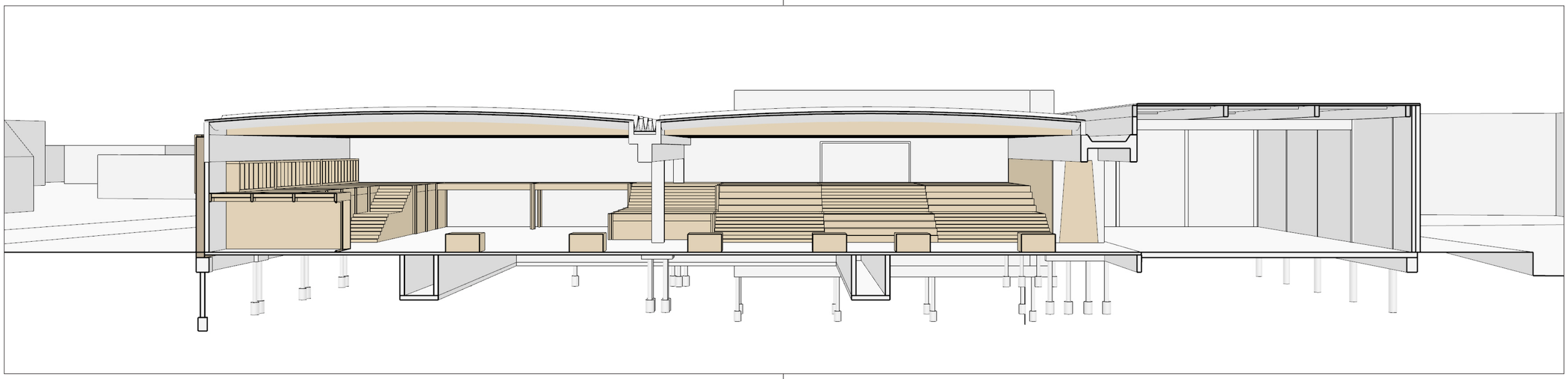


SCENARIOS

PHASE 0

1. Workshop
2. Exhibition
3. Shop
4. Classrooms





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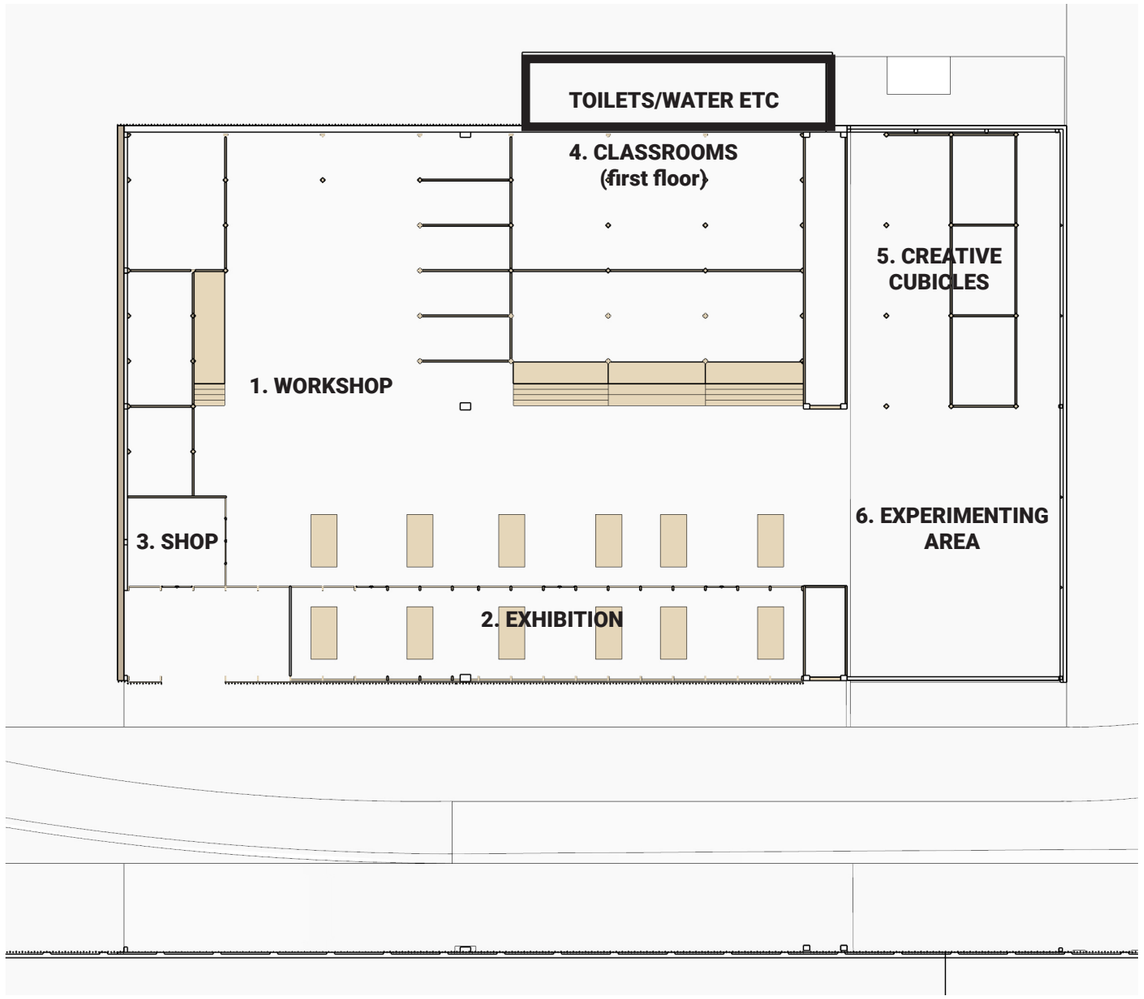

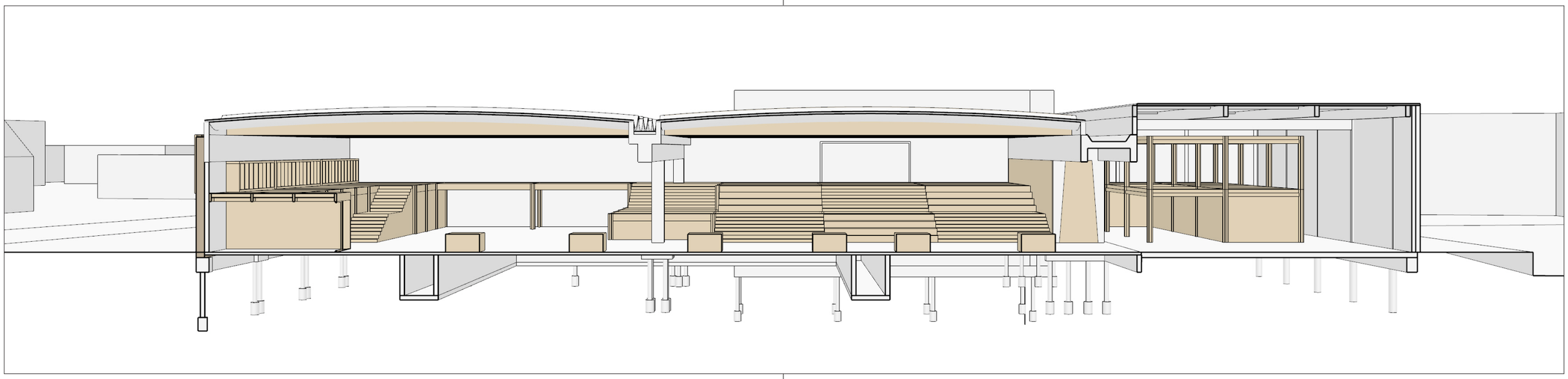

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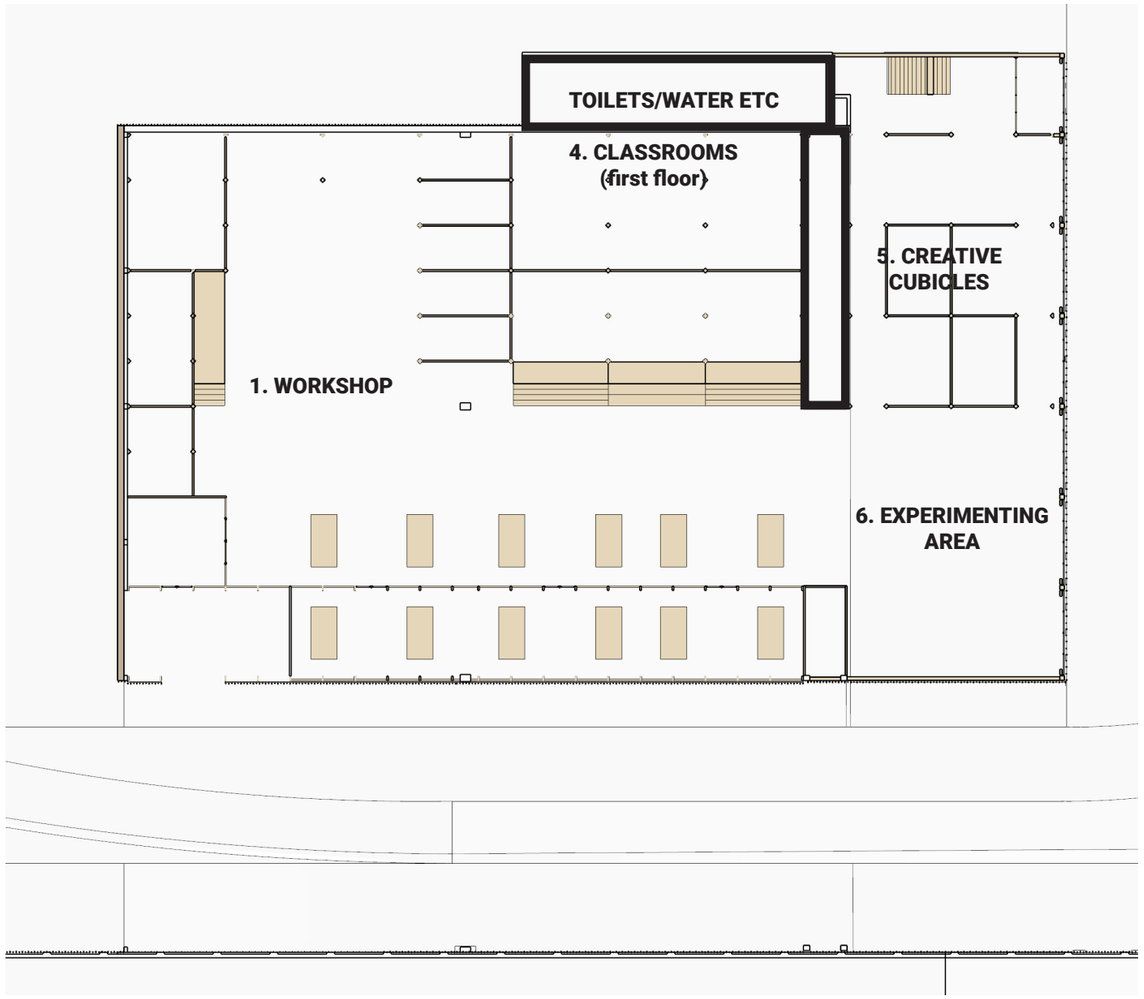

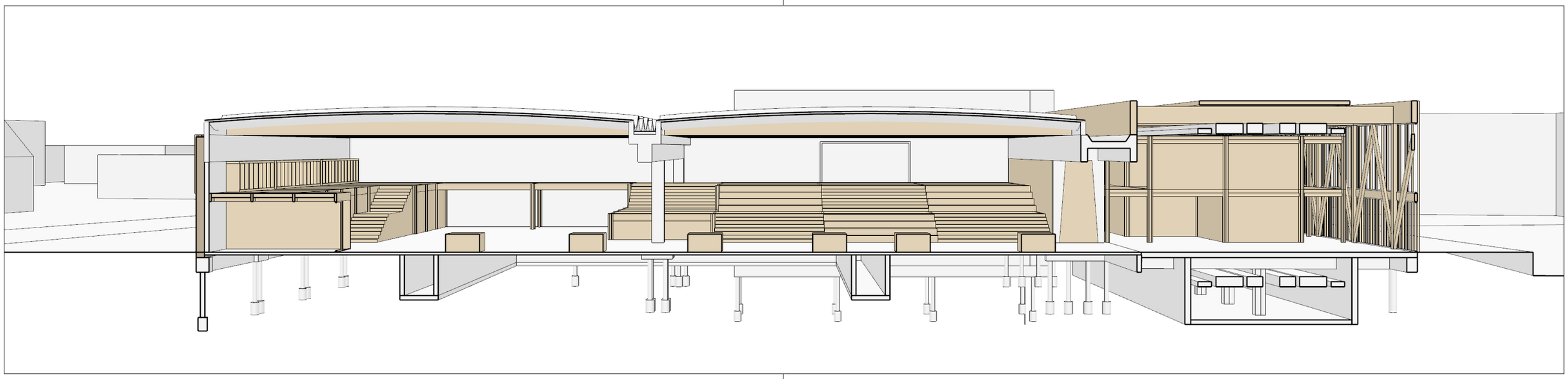

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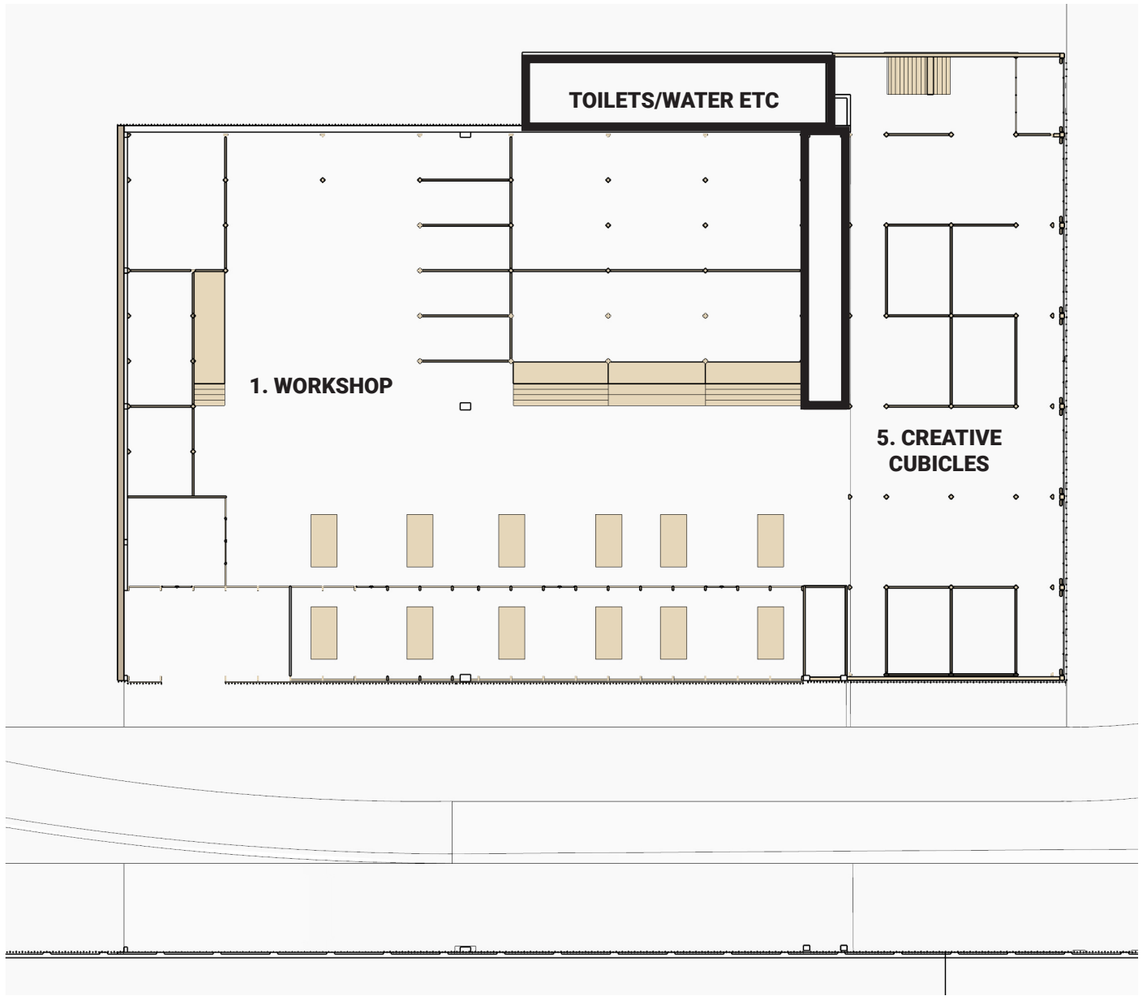
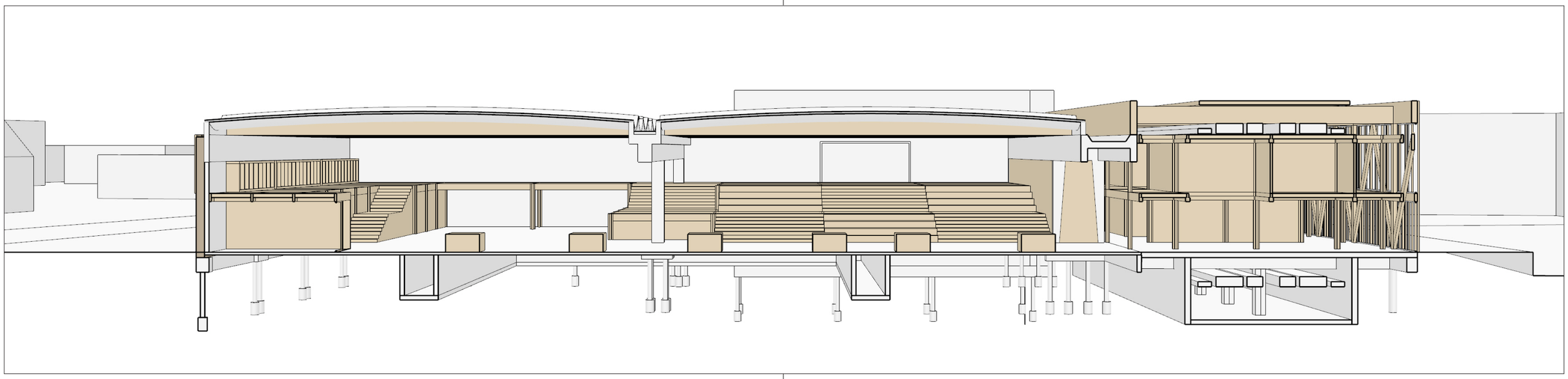




TIMBER TOWN

26-03-2020

THIS WEEK

TUTORING 27-03-2020

ARCHITECTURE

- Try to use the scenarios for the presentation as back bone: cultural values, climate and circularity can be connected to this
- How to use new in old buildings: Ando in Venetia: Punta dell Dogana
- Look at the presentation of Matthew Cook (stories)
- Pay attention to users
- For circularity it is good to look at examples like Superstudio, also simplicity is important: look at John Maeda: The Laws of Simplicity. How can this façade contribute to multiple things like sunshading etc --> Basic system.
- How about logistics and the design of the public space/surroundings?

BUILDING TECHNOLOGY (MICHIEL)

- Try to strive for symbiosis
- Focus on the smart timber wrap: sunlight functions etc. Interesting: what can you do with timber? What is the timber concept?
- Who is the owner? Can you connect this to your concept?
- See if your venitilation if working like this with inlet and output so close to each other
- Maybe you need sounds absorption under the element

- Next time focus: Plans, divisions, users, façade (shell)

FRANK

- Draw the supporting layer of soil in your sections
- Make an overview of heat sources and how many destinations there are (connecting multiple buildings). Maybe it will be useful to connect the whole of the Morsepoort to that idea
- Pay attention to costs vs. installations
- Make these ventilation grills adjustable
- Tip: Look at the floriade, maybe the HP shells can be used for sutainability reasons

PLANNING

VRIJDAG 27-03

- Updating scenarios
- Start P3 presentation
- User stories

ZATERDAG 28-03

- Update Graduation plan
- Reflection

ZONDAG 29-03

- Site functionality
- Story within the building
- Story of circularity

MAANDAG 30-03

- Think about timber concept, think about façade system
- Draw concept for presentation

DINSDAG 31-03

- 3D model: draw timber wrap in detail, draw connections demountable structure, draw connections structure timber façade
- Sections 1:20 (One of the East façade and one of the West façade)

WOENSDAG 01-04

- Finishing presentation
- Typing text
- Learning text

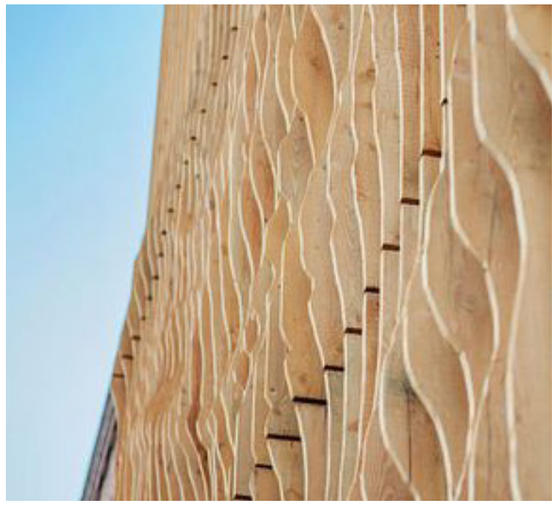
DONDERDAG 02-04

- P3

FAÇADE

SMART TIMBER WRAP

-The flexible approach of the whole Morsepoort and the spaces asks for a flexible approach of the façades



- Irregular shaped vertical slats

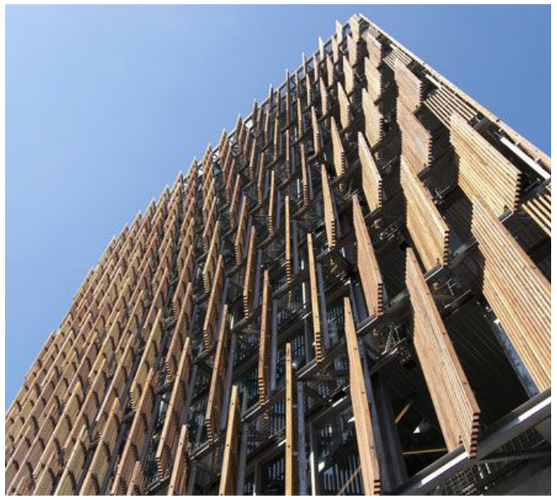
- Flexible rotating timber louvres

- Twisted timber vertical slats

- Flexible, kinetic timber louvres façade

- Different dimensions and distances of the vertical timber slats create different views from inside

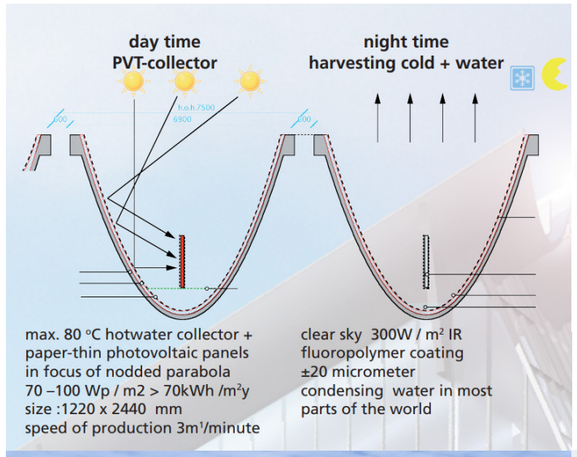
Moveable timber elements in façade, blocking sunlight

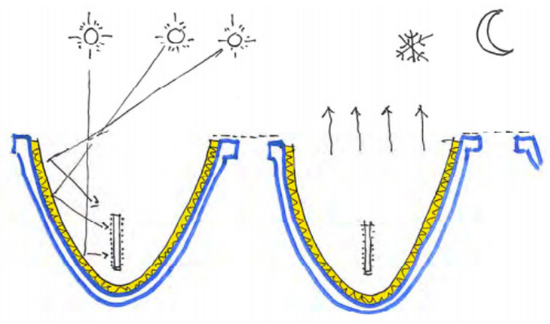


ENERGY SYSTEMS

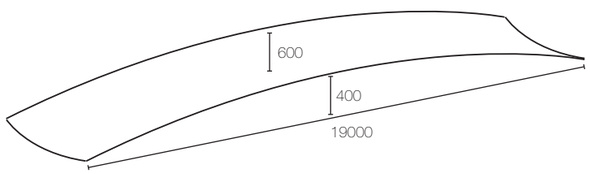
VILLA FLORA, VENLO

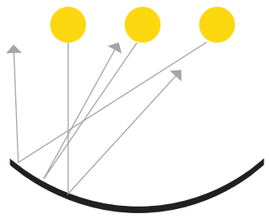
- Jón Kristinsson Architects
- Wereldtuinbouwtentoonstelling Floriade





- This sustainable design was never built as it was supposed to (see pictures), presumably because of high costs and low efficiency





- HP-shells in Winterswijk are to flat to function in the same way

OTHER SOLUTIONS

- Hyet tandem solar cells
- Flexible, light solar cell panels for roofs

Electrical characteristics

Measured at Standard test conditions
(STC; 25 °C cell temperature, insolation 1000 W/m², AM 1.5)

Rated Power	P_{max}	165 W
Production tolerance of	P_{max}	±5 %
Rated Voltage	V_{mpp}	28 V
Rated current	I_{mpp}	5,9 A
Open circuit voltage	V_{oc}	38,1 V
Short circuit current	I_{sc}	6,5 A

Measured at Nominal Operating Cell Temperature
(NOCT; ambient temperature 20 °C, insolation 800 W/m², AM 1.5, 1 m/s wind speed)

NOCT		45°C
Maximum Power	P_{max}	132 W
Voltage at max. power	V_{mpp}	28,0 V
Current at max. power	I_{mpp}	4,7 A
Open circuit voltage	V_{oc}	36 V
Short circuit current	I_{sc}	5,3 A

General characteristics

Dimensions	5930x325x0.4 mm, depth at junction box 12 mm
Weight	1.3 kg
Cell type	28 amorphous/microcrystalline tandem silicon solar cells (5910X10 mm), connected in series
Front sheet	fluorine polymer
Junction	EPIC Solar Map
Connector	quick-connect terminal (overmoulded)
Cable type	Solar cable (4.0 mm²), length 325 mm

Calculation of the solar PV energy ouput of a photovoltaic system

Yelow cell = enter your own data
Green cell = result (do not change the value)
White cell = calculated value (do not change the value)

Global formula : E = A * r * H * PR

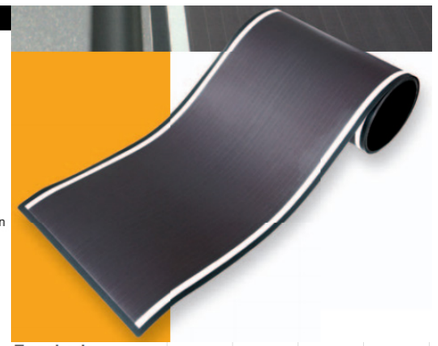
E = Energy (kWh)	29228	kWh/an
A = Total solar panel Area (m²)	400	m²
r = solar panel yield (%)	10,0%	
H = Annual average irradiation on tilted panels (shadings not included)*	974,8541667	kWh/m².an
PR = Performance ratio, coefficient for losses (range between 0.9 and 0.5, default value = 0.75)	0,75	
Total power of the system	40,0	kWp

Losses details (depend of site, technology, and sizing of the system)

- Inverter losses (6% to 15 %)	8%
- Température losses (5% to 15%)	8%
- DC cables losses (1 to 3 %)	2%
- AC cables losses (1 to 3 %)	2%
- Shadings 0 % to 40% (depends of site)	3%
- Losses weak irradiation 3% yo 7%	3%
- Losses due to dust, snow... (2%)	2%
- Other Losses	0%

*You can find this value on the map below or here : solar radiation data
You have to find the global annual irradiation incident on your PV panels with your specific inclination (slope, tilt) and orientation (azimut).

More info
Source : www.photovoltaic-software.com



Enschede
Average Solar Insolation figures

Measured in kWh/m²/day onto a horizontal surface:

Jan	Feb	Mar	Apr	May	Jun
0,74	1,45	2,35	3,61	4,76	4,77

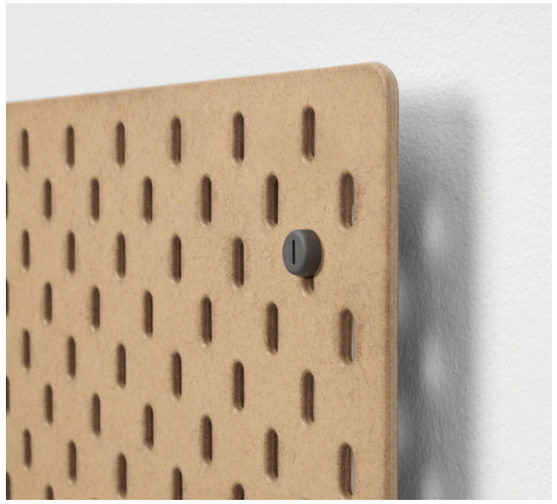
Jun	Jul	Aug	Sept	Oct	Nov	Dec
4,77	4,66	4,09	2,74	1,51	0,8	0,57

gemiddeld da	2,670833333	kWh/m2/day
totaal jaarlijks	974,8541667	kWh/m2/jaar

CREATIVE CUBICLES

DESIGN IDEAS

- One system which can provide for multiple things, pracitcal/functional because of relatively small space.



IKEA utensils hanging flexible system as inspiration

Re-using old window frames for transparant parts

Hanging wall plants

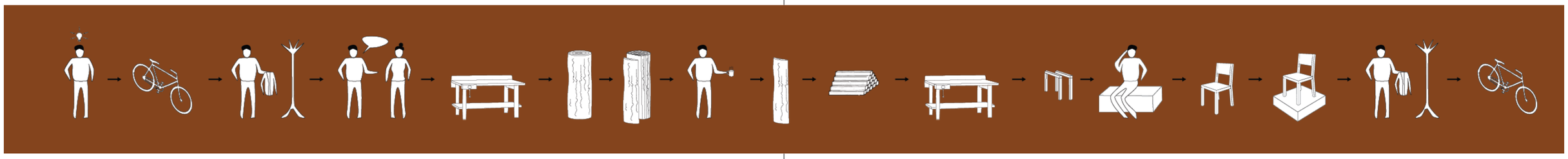
JOHN MAEDA: LAWS OF SIMPLICITY

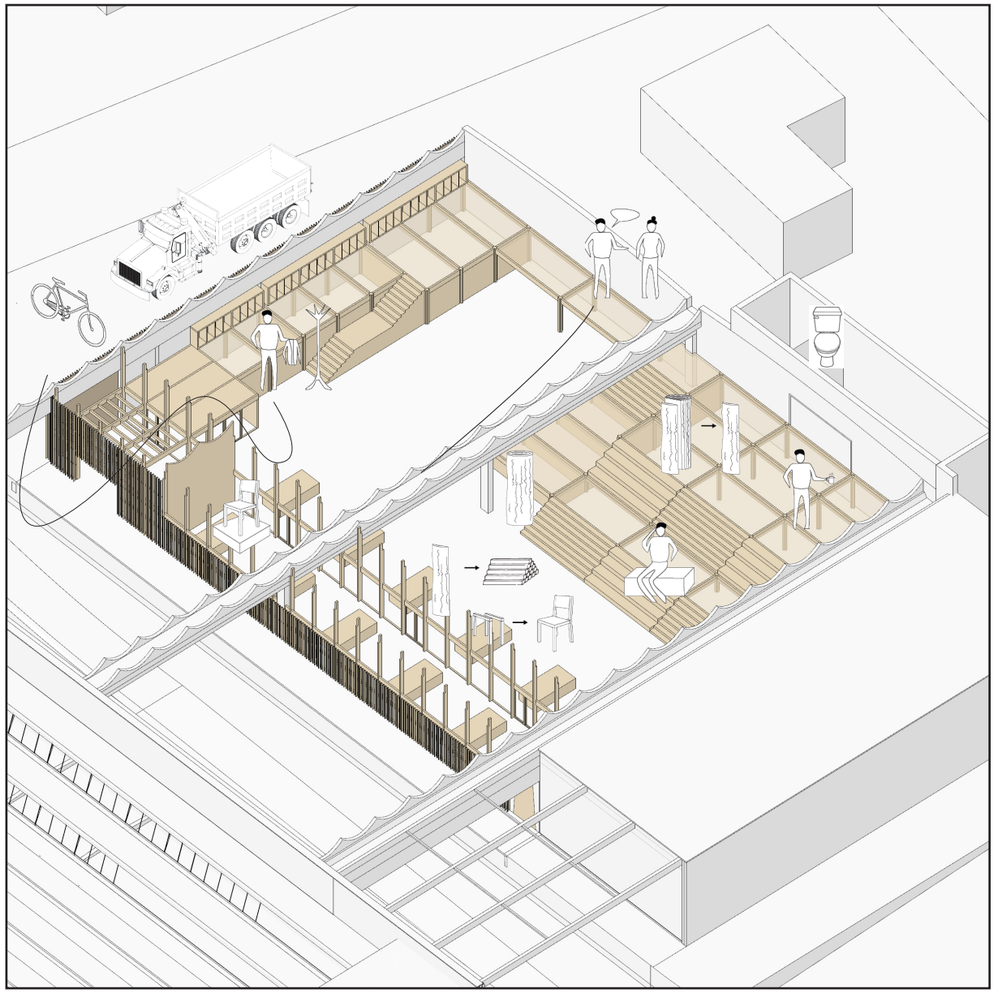
- Elements of the creative cubicles: walls/floor/roof outside, walls/floor/ceiling inside, installations, acoustics, utilities. Connects these with the 10 laws of simplicity.

How to use this in the design for the cubicles?

1. Reduce: only add necessary items
2. Organize: one system for multiple solutions
3. Time: make the cubicle as functional as possible
4. Learn: learn about circularity and timber (CLT)
5. Differences: mix materials
6. Context: come up with a repetible system
7. Emotion: the more ways to make it adaptable to the person, the better
8. Trust: In simplicity we trust
9. Failure: Some things can never be made simple
10. The One: simplicity is about subtracting the obvious, and adding the meaningful

USERS





CHARACTERISTICS:

- WORKING, LABOUR
- MINIMUM OF 4 HOURS
- FLEXIBLE

1. ACOUSTICS

MAX. 75 dB NOISE

4. SMELL

TOLERABLE

2.TEMPERATURE

MIN. 16ºC, MAX. 23ºC

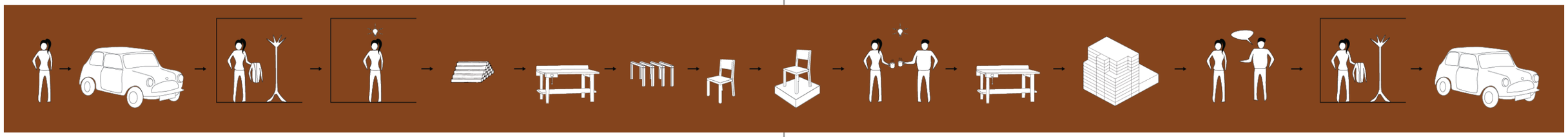
5. DAYLIGHT

6000 KELVIN,
500 LUX

3. VENTILATION

FRESH AIR
VENT. RATE/H, 5

USERS



CHARACTERISTICS:

- WORKING, OFFICE
- MINIMUM OF 4 HOURS
- CONSTANT CLIMATE

1. ACOUSTICS

MAX. 55 dB NOISE

4. SMELL

NOT TOLERABLE

2.TEMPERATURE

MIN. 19°C, MAX. 21°C

5. DAYLIGHT

4000 KELVIN,
400 LUX

3. VENTILATION

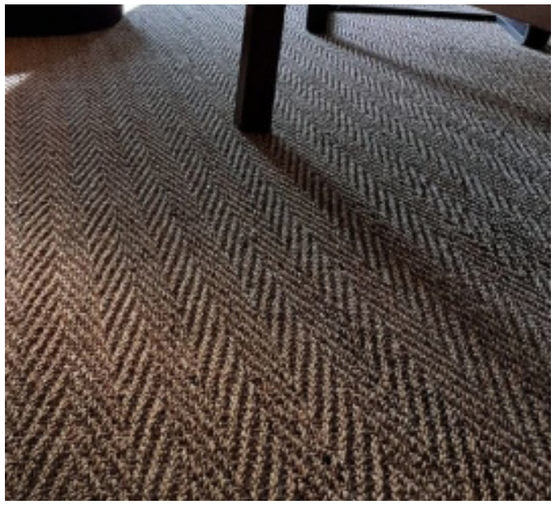
FRESH AIR
VENT. RATE/H, 4

CREATIVE CUBICLES

CREATIVE CUBICLES

CIRCULARITY

- PET-felt for acoustc insulation



- Seegrass rug, biologically degradable

- Cardboard lamp

- Pot made from paper and old car tires

Superuse Studio: Reusing materials (old swimming pool Tropicana), circular interior (Villa Welpeloo)

P3 PRESENTATION

02-04-2020

HIELKJE:

P3 is at a good level. Sufficient progress has been made between P2 and P3. A phasing of the plan has been proposed based on scenarios. That works well in the presentation. As a result, “in principle” matters are resolved in the design. But now you need to design further based on those principles. You can play with it, but also understand the (un)realistic consequences. Do so many parts of the roof have to go? How can the facade be designed in a more flexibly / adaptable way instead of pragmatic? The economic side can also be better explored. The different storylines are now told parallel. If they become more interwoven, “knots” will be created, but it is precisely there that it becomes interesting. Parts can be simplified (save building material). The message is clear. The project has the potential to become a good overall project.

- Starting points design with in the presentation. It is hard to fiigure out how these are integrated in the design.

- Explain about the demolition of some buildings

- Material passport: based on what? Material re-used?

- How is the project economically feasible? (in users story)

- See from outside? Façade? Shop?

- Two story lines are interfering: the phases and the design starting points --> combine?

- There’s a lot about the interior, time to move to the exterior for P4

Frank:

- Show the different steps also in detail

- Re-using the shells is extremly difficult. Are there alternatives?

- How many of these shells need to be removed? The intension is ok but how much daylight is needed?

- The demountable structure can be optimized to used less material, so the partition walls can be made just a timber skeletton

Lidy:

- It’s too much a business plan, what is the architectural goal ? (Hielkje: can people build their own tiny house?)

- Think of your ambition with the architecture: daylight, sightlines, placement/rhytm of the columns in the space/ partitions. Now the design looks very implicit: make it more explicit

Wrap-up:
Re-consider the current design, go back tot the design starting points can help with this. Synthesize the story lines. Explain more why and work more with arguments.

Questions and comments presentation Juliëtte:

Hielkje: Thank you for your stories, a lot of different stories you can tell about timber town. It looks like you have a mixture of two story lines, and the first is lost by telling the second storyline. First: analysis diagrams found from the analysis. Then you transform them in the diagrams of starting points and including the assessment of values and balancing negavite and positive qualities. You started with one of the diagrams and the others were lost in the story. That is a pity and could be more integrated. It can be more integrated in the story of the phases and uses but that is complex.

You switch over the term material passport very quickly, used by Thomas Rau oid. You start with existing builidings the passports of them. And what for the new buildings?
Then you go very rapidly to the phase -1 and 0 and you say I demolish some buildings. Why you consider those to be demolished?

Juul: it looks like a lot has been demolished but it’s not the case. See also P2. The route goes through a lot of the buildings but only the facades are demolished but the structure is being kept. The others that block the route are only later additions and valued less. It comes from the masterplan.

H: emphasize more on this the next Presentation. The environment and the connections and the bigger site. And the masterplan. That’s really part of the whole story behind it.

Other thing: you with the stories of the users, and then it ends with exhibition. Is there something after, a shop? Something economical or financial? Somehow think of all the stages of how the financial balance will work.

Juul: due to the 20 minutes but first the idea is to spread the development to make it more feasible. First the machines and then the creative cubicles and those get better and better. Across the street the other building, I like to emphasize more on that, because it has for example classrooms and a shop and that can generate more money. It is not only the building with the shells and the extensions.
Compare Strijp R: a lot of shops and commercial to make it feasible and make it also an attraction.

H: Now it is time to move to the exterior. Exhibition space looks like a closed façade with the rhythm, but I expect it to be more open. Or does it still needs to be added in the drawings.

Juul: true, the idea of the vertical slabs is that you walk past it it looks closed but if you look to the side it opens. Now if you look to the stages where the exhibition will move to the other side so more flexibility is needed also from this façade. It needs to be more open or flexible or adjustable to future functions. The timber wrap needs to be recognisable what functions are behind so it needs to be worked out. Yesterday: I may want to incorporate a shop where you can buy materials from demolished buildings in the area. There is one in Doetinchem. It could be really nice to incorporate this idea of circularity and there is enough space in the shed roof building.

F: appreciate the scenario approach of the presentation. Helpful to also do that on a detail scale. Issues I am worried about is to reuse the shells in a pavilion structure. It is a complicated operation to do that, of course possible but it is quite unrealistic to do that. How do you imagine the transport of these elements to the new structure, very complicated.

P3 PRESENTATION

Other issue: how many of the existing shells do you need to remove of the existing building? Intention is to introduce daylight but how many elements do you need to remove for this amount of daylight you need? Clear overview of climate and comfort you make. Now it is 1:1 but this relation can be different.

Juul: Initially the idea to do 1:1 was to keep the rhythm of the shells. But yesterday I was practicing the presentation. But light doesn't specifically daylight, so why do I want to remaove so many shells? I need to reconsider that.
Frank: For sure it is nice to create rhythm but it can also be 1:2 or 1:3.
Juul: Agree

Frank: new building you create in CLT. Basically you make a structure of columns and beams, which is strong enough already so you don't need also CLT walls. The CLT walls are very heavy and more material than you need. They are not structural but filling elements. Think of that. Reduce the amount of material used in the wall elements of the CLT building. Floors need to be of CLT because they are structural. You want a flexible system so you opt for columns and beams so you you can have lighter wall elements. (Marloes: wood sandwich panels)

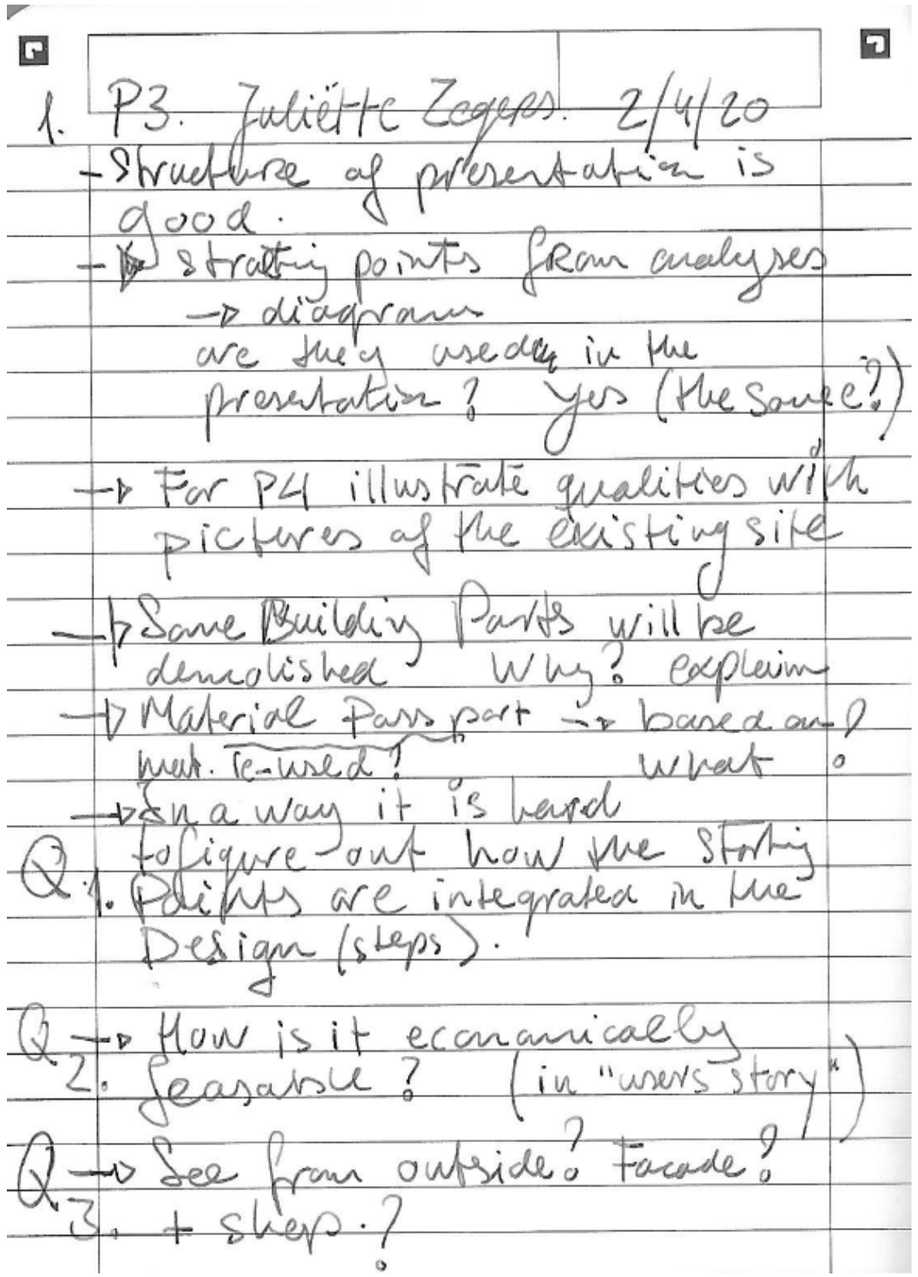
Lidy: Thank you for your story. I hear a lot of business plan. What is the architectural plan? The architectural goal?
Juul: The architectural goal comes back in this idea of the smart timber wrap. The idea is to show what is possible with timber and how these timber elements can form the architectures. You have cubicles but also the timber façade. The expression of bare timber. The users are related to timber or like it so to show them the possibilities.

Lidy: I would like to explain a bit about this section. The cubicles are a room in a bigger building. You have to provide daylight in there. What is the idea of the daylight inside, what is the texture of this inside space, now it is all timber finish. Or is it true, is there a colour of the door, a system of the walls. Is it an exisiting system and how is that related to the system of partition of the walls. Many things that are quite explicit in your drawing. Make them more explicit in your P4.
Juul: people can compose their own space, of course they can paint the walls but I want to leave it to them. For P4 it can be good to give a few options how to do this. For daylight rooflights. There is a lot of daylight in the bigger building, the cubicles are more closed and get daylight from inside windows.
Hielkje: daylight doesn't ener the cubicle in this drawing, develop further.

Charlotte: short. Scenario thinking nice, very good way of thinking about these type of sites. Apart of that the approach you make some irreversible decisions very early in the process. Not really a question but how to approach this ideas. Next P4 this step by step area development can become a test ground for various heritage approaches. Same approach for the different heritage buildings on the site. So information about different approaches will evolve over time.
Juul: do you mean there has to be a general idea how to deal with all the buildings? I am trying to narrow it donw.
Charlotte: now more a story step by step architectural and economic. But also this step by step approach of the intire heritage area.
Hielkje: this can be in your reflection paper as well. Look back on the process an the results and find arguments to make it a logical story on the heritage point of view.

Wrap up Hielkje: you presented a lot of ideas and storylines. In a way the storylines sometimes end and sometimes they continue. You can practice more on emphasize where the different sotyrlines connect. Where user connects to architecture or heritage. But first you need all the ingredients to do this. A lot of the ingredients are already there. Findings form the analysis, starting points of the design. So it is now synthesising and reconsidering to think more in different possibilities in structure/detaisl/installations/climate. Not only in the places but also in the solutions that are possible. The basics are there but you can really work on the aspects and then go back to the basis to make the starting points more clear in the end.

FEEDBACK:


1. P3. Juliëtte Zegers. 2/4/20
- Structure of presentation is good.
- starting points from analyses → diagrams are they used in the presentation? yes (the source?)
→ For P4 illustrate qualities with pictures of the existing site
→ Some Building Parts will be demolished Why? explain
→ Material Pass. part → based on? mat. re-used? what?
→ in a way it is hard to figure out how the Starting Q 1. Points are integrated in the Design (steps).
Q → How is it economically 2. feasable? (in "users story")
Q → See from outside? Facade? 3. + shop.?

2.

Climate scheme related to use
= good

Facade + climate ‖ Solutions.

Two story lines are interfering.
→ 1 → 5 phases.
→ starting point diagrams (combine ?)

The presentation is a bit "flat"
"monotone"
Now a lot about the interior,
time to move to the exterior → P4

→ Shop + economics

Trade: phases. | also on detail ‖
'nice?' scale.
* How with re-using the shells?
Unrealistic → alternatives?
* How many need to be removed? To
intension is ok, how much
daylight is needed?
FR: → structure can be optimized
(less materials).

3.

City's to much a brainwash
What is the Architectural Goal
→ What is all possible with TIMBER
(H2: can people build their own
tiny house?)
→ Day light in kubicels. | sight lines!
→ partitions ‖ be more explicit
about the
Clarity? "this is what I demolish"
Arguments needed.

Test ground	
Heritage	
Approach	

Wrap Up:
A lot of ideas / story lines
Consequences became clear
Re-consider the current design
Go-back to the starting points
can help with this
Synthasise the story lines
Explain a bit more on
"why"
Work on arguments etc.
Work on "technique" as part
of the story lines as well

TO P4

PLANNING

- Starting points design with in the presentation. It is hard to fiigure out how these are integrated in the design.

--> Reconsider design starting points and think about the different story lines: Start test P4 presentation

- Material passport: based on what? Material reused?

--> Reconsider the term and finish this idea (what is there and what can you use?)

- How is the project economically feasible? (in users story)

--> Draw diagrams for the economic feasibility

- See from outside? Façade? Shop? Time to move to the exterior for P4

--> Focus on the 'smart timber wrap'

- Re-using the shells is extremly difficult. Are there alternatives?

--> Pay more attention to the shells, make a list: pros and cons (demounting/daylight/cultural values)

- It's too much a business plan, what is the architectural goal ? (Hielkje: can people build their own tiny house?) Make the design more explicit.

--> Think about the architectural goal and try to set this clear for the multiple building parts
--> Think of your ambition with the architecture: daylight, sightlines, placement/rhytm of the columns in the space/partitions. Now the design looks very implicit: make it more explicit

--> Incorporate more of the shedroofs into your design: work on 3D model.

--> Start a 'Test P4' where you can experiment with a new story

--> Work on scheme in Graduation plan and Reflection

BIG THEMES THAT NEED TO BE TAKEN CARE OF AND PLANNING:

- WEEK 1 (9-16) >> FAÇADES: 2 (WORKSHOP) + 1 (CREATIVE CUBICLES) + 2 (SHEDS)
- WEEK 2 (16-23) >> ARCHITECTURAL APPEARANCE INTERIORS
- WEEK 3 (23-30) >> WORK ON DETAILS
- WEEK 4 (30-7) >> FOCUS ON SHED ROOF BUILDING
- WEEK 5 (7-14) >> DESIGN OF THE CREEK + LAST IMAGES AND PRESENTATION + REFLECTION

PRESENTATION AND DESIGN STARTING POINTS

3 approaches of presentation technique:

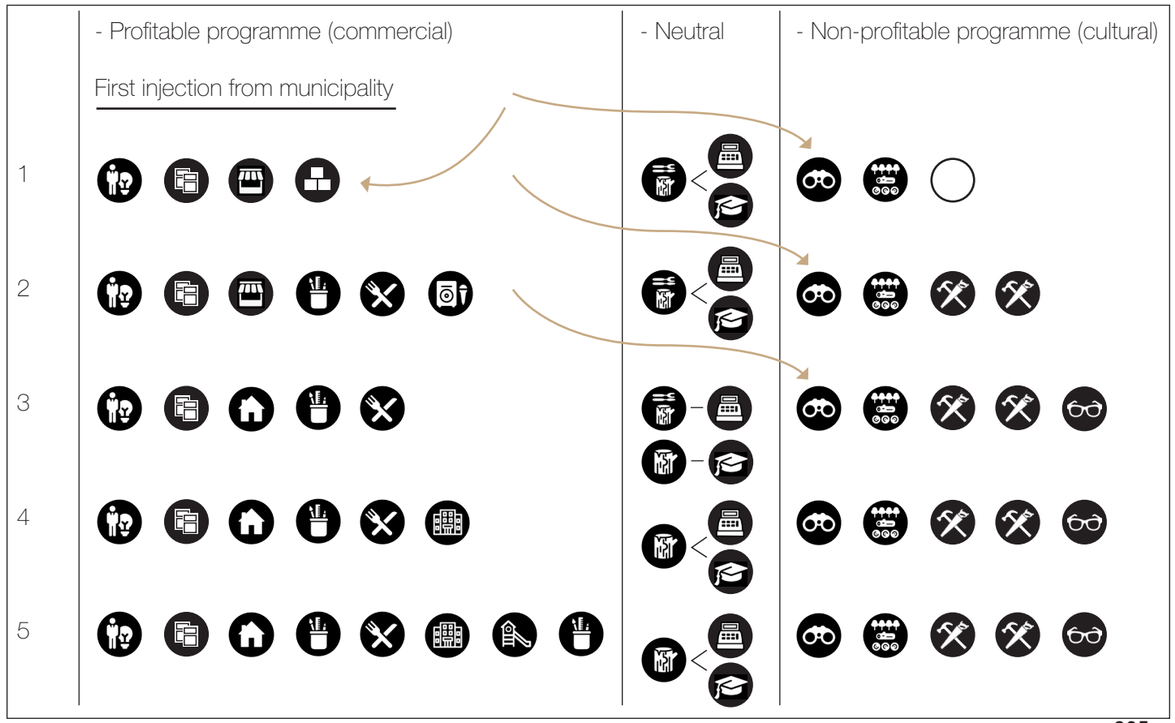
- Based on the design starting points:
  - Pros: clear explanation different important aspects, followable
  - Cons: difficult to incorporate different stages and development

- Based on the stages:
  - Pros: keeping track of the development and stages
  - Cons: difficult to focus on particular building parts

- Solution:
  - First explain the bigger picture through stages so that people get familiar with the idea (first focus on the development). Then zoom in on the particular building parts to tell the story about the development into more detail (even into the smallest detail). Show when the design starting points are touched upon.

  Tell the 'functional' story by plans and by explaining the section
  Tell the 'architectural' story by showing the plan and perspectives

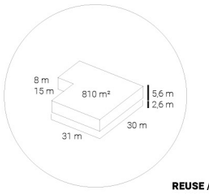
ECONOMICAL PERSPECTIVE - BALANCE



CIRCULARITY

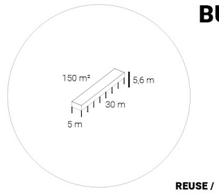
INVENTARISATION OF MATERIALS

BUILDING 2



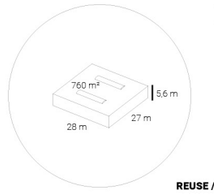
	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Reinforced concrete floor	810*0,3=243m³		
	Reinforced concrete walls	138*2,6x0,3=108m³		
STRUCTURE	Concrete piles basement	2,6*0,3*0,3*11=2,6m³		
	Steel I-beams (300)	6*4 beams=24m		
	Steel H-columns (200)	5*16 columns=80m		
ROOFING	Steel I-beams (270)	39*4 beams=156m		
	Steel roof (106)	810m²		
	Insulating foam	810*0,08= 65m³		
	Roofing	810m²		
FAÇADE	Brick cavity wall	(78*5,6-53,5)*0,1*2=77m³		
	Industrial door	5*4,5=22,5m²		
	Industrial door	5*3=15m²		
	Windows	1,5*2,1*2=6,3m²		
	Door	2,3*2,1*2=9,7m²		
FLOORING	Concrete floor	810x0,3=243m³		
INTERIOR WALLS	Brick cavity wall	(10,5+12,75+10,5+8,5)*5,6*0,1*2=47m³		

BUILDING 2A



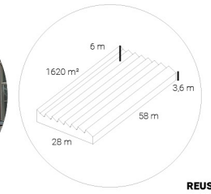
	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Concret piles	2,6*0,3*0,3*8=1,9m³		
STRUCTURE	Steel H-columns (300)	5*8 columns=40m		
	Steel I-beams (320)	5,6*8 beams=44,8m		
ROOFING	Top, steel roofing	150m²		
	Side, steel roofing	70*2,5=175m²		
FAÇADE				
FLOORING				
INTERIOR WALLS				

BUILDING 3



	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Concrete piles	3		
	Brick foundation	110*1*0,1*2=22m³		
STRUCTURE	Steel H-columns (140)	5,6*19 columns=106m		
	Steel I-beams (360)	27*9 beams=243m		
ROOFING	Steel roofing	760-39=721m²		
	Roofing	760-39=721m²		
	Roof windows	3*13=39m²		
FAÇADE	Brick cavity wall	(138*3,6-7,5)*0,1*2=80,5m³		
	Steel cladding	138*2=276m²		
	Windows	2*1*2=4m²		
	Door	2,3*2=3,5m²		
FLOORING	Concrete floor	760x0,2=152m³		
INTERIOR WALLS				

BUILDING 4

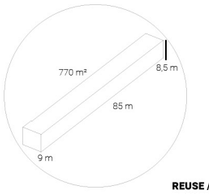


	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Brick foundation	114*1*0,1*2=23m³		
	Concrete piles	24*1*0,4*0,4=3,8m³		
STRUCTURE	Cast iron columns	24*3,4=82m		
	Cast iron beams	32*7,5=240m		
ROOFING	Timber beams	(2,8*3*9*7)+58*3*8=1390m		
	Glass	(1,1*1,4)*6*9*7=580m²		
	Timber roofing	(1,1*2,8)*6*9*7=1160m²		
	Roofing	1160m²		
FAÇADE	Brick walls	114* 4,8*0,1*2=110m³		
FLOORING	Concrete floor	1620x0,2=324m³		
INTERIOR WALLS				

CIRCULARITY

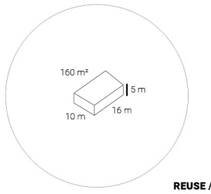
INVENTARISATION OF MATERIALS

BUILDING 5



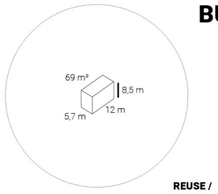
	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Brick foundation	188*1*0,1*2=38m³	♻	🍃
STRUCTURE	Concrete/steel elements	770*0,5=154m³ (35)	♻	🍃
	Steel I-beams	35*9,5*0,2=67m³	♻	🍃🍃
	Purlins	85*0,1*0,07*9=5,4m³	♻	🍃🍃🍃
ROOFING	Timber roofing	770m²	♻	🍃🍃🍃
	Roofing	770m²	♻	🍃
FAÇADE	Brick cavity wall	(188*8,5-218)*0,1*2=3276m³	♻	🍃🍃
	Windows	2,4*1,3*70=218m²	♻	🍃🍃
FLOORING	Concrete floor	770x0,2=154m³	♻	🍃
INTERIOR WALLS	Unknown			

BUILDING 9



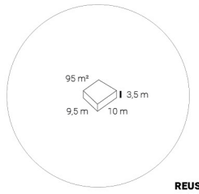
	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Concrete foundation	26*1*0,2=5,2m³	♻	🍃
STRUCTURE	Steel H-columns	7*5*=35m	♻	🍃🍃
	Steel I-beams	3*10*=30m	♻	🍃🍃
ROOFING	Steel roofing	160m²	♻	🍃🍃
	Roofing	160m²	♻	🍃
FAÇADE	Steel cladding	(10*5+16*5)=130m2	♻	🍃🍃
	Truck door	3,5*3=10,5m²	♻	🍃🍃
FLOORING	Concrete floor	160x0,2=32m³	♻	🍃
INTERIOR WALLS				

BUILDING 10



	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Unknown			
STRUCTURE	Steel I-beams	4*5,7*=22,8m	♻	🍃🍃
ROOFING	Steel roofing	69m²	♻	🍃🍃
	Roofing	69m²	♻	🍃
FAÇADE	Steel cladding	(5*5,7*2)=57m2	♻	🍃🍃
	Truck door	3*4=12m²	♻	🍃🍃
FLOORING	Concrete floor	69x0,2=14m³	♻	🍃
INTERIOR WALLS				

BUILDING 11

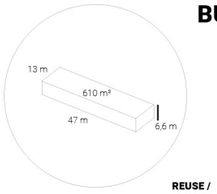


	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Brick foundation	19,5*1*0,1*2=4m³	♻	🍃
STRUCTURE	Unknown (façade)			
	Concrete slabs	95*0,3=3m³	♻	🍃🍃🍃
ROOFING	Timber roofing	95m²	♻	🍃🍃🍃
	Roofing	95m²	♻	🍃
FAÇADE	Brick cavity wall	(19,5*3,5)*0,1*2=14m³	♻	🍃🍃
	Windows	1*1*6=6m²	♻	🍃🍃
FLOORING	Concrete floor	95x0,2=19 m³	♻	🍃
INTERIOR WALLS	Unknown			

CIRCULARITY

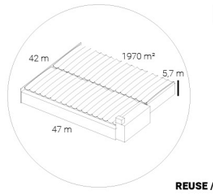
INVENTARISATION OF MATERIALS

BUILDING 12



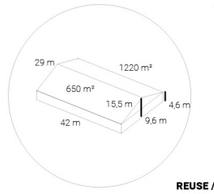
	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Concrete piles	4*0,36*0,36*10=5,2m³		
	Concrete beam	47*0,4*0,6=11,3m³		
STRUCTURE	Steel H-columns	6,2*12 columns=74,4m		
	Steel I-beams (600)	46,5*3 beams=139,5m		
	Steel I-beams (450)	11*3 beams=33m		
	Steel I-beams (150)	11*6 beams=66m		
ROOFING	Roofing	610m²		
	Insulation	610*0,1=61m³		
	Steel roofing	610m²		
FAÇADE	Brick cavity wall	(60*6,6-7,6)*0,1*2=77,7m³		
	Windows	1,2*1,5*2=3,6m²		
	Doors	1,8*2,2=4m²		
FLOORING	Concrete floor	610x0,3=183m³		
INTERIOR WALLS				

BUILDING D



	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Foundation piles	49		
	Concrete foundation beam	157*0,3*0,6=28,3m³		
STRUCTURE	Concrete portals	0,4*0,3*6,4*4=3m³		
	Concrete columns	0,3*0,2*4*6=1,4m³		
	Concrete columns	0,4*0,6*4*2=1,9m³		
	Concrete columns	0,3*0,6*4*2=1,4m³		
	Concrete beams	0,2*1,2*46,8*2=11,2m³		
	Concrete beams	1*46,8=46,8m³		
ROOFING	HP-shells	36		
	Roofing	1970m²		
FAÇADE	Brick cavity wall	136*5,1*0,1*2=139m³		
	Aerated concrete blocks	136*5,1*0,1=69m³		
FLOORING	Concrete floor	1970*0,2=394m³		
INTERIOR WALLS	Polycarbonate wall	42*5*0,1=21m³		

BUILDING E



	MATERIAL	QUANTITY	REUSE / RECYCLE/ DOWNCYCLE	SUSTAINABILITY
FOUNDATION	Concrete piles	0,4*0,2*1*18=1,4m³		
	Brick foundation	142*1*0,1*2=28,4m³		
STRUCTURE	Laminated timber beams	9		
	Timber purlins	0,16*0,06*42*15*2=12m³		
ROOFING	Timber roofing	650*2*0,02=14m³		
	Roofing	650*2=1300m²		
FAÇADE	Brick cavity wall	(142*4,6+145-15)*0,1*2=157		
	Doors	2,5*3*2=15m²		
FLOORING	Concrete floor	1220*0,1=122m³		
INTERIOR WALLS				

CIRCULARITY

BUILDING 2

Concrete piles basement	2,6*0,3*0,3*11=2,6m³	Brick cavity wall	(78*5,6-53,5)*0,1*2=77m³
Steel I-beams (300)	6*4 beams=24m	Industrial door	5*4,5=22,5m²
Steel H-columns (200)	5*16 columns=80m	Industrial door	5*3=15m²
Steel I-beams (270)	39*4 beams=156m	Windows	1,5*2,1*2=6,3m²
Steel roof (106)	810m²	Door	2,3*2,1*2=9,7m²
Insulation foam	810*0,08= 65m³	Concrete floor	810x0,3=243m³
Roofing	810m²	Brick cavity wall	(10,5+12,75+10,5+8,5)*5,6*0,1*2=47m³

BUILDING 2A

Top, steel roofing	150m²
Side, steel roofing	70*2,5=175m²

BUILDING 3

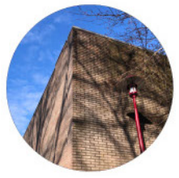
Brick cavity wall	(27*3,6-7,5)*0,1*2=18m³
Windows	2*1*2=4m²
Door	2,3*2=3,5m²

BUILDING 4

Brick walls	58* 4,8*0,1*2=56m³

BUILDING 5

BUILDING 12



Steel H-columns	6,2*12 columns=74,4m	Steel roofing	610m²
Steel I-beams (600)	46,5*3 beams=139,5m	Brick cavity wall	(60*6,6-7,6)*0,1*2=77,7m³
Steel I-beams (450)	11*3 beams=33m	Windows	1,2*1,5*2=3,6m²
Steel I-beams (150)	11*6 beams=66m	Doors	1,8*2,2=4m²
Roofing	610m²	Concrete floor	610x0,3=183m³
Insulation	610*0,1=61m³		

BUILDING D

HP-shells	4
Roofing	4*50=200m²
Brick cavity wall	(16*2)*5,1*0,1*2=33m³
Aerated concrete blocks	(16*2)*5,1*0,1=16m³
Concrete floor	8*70*0,15=84m³
Polycarbonate wall	42*5*0,1=21m³

BUILDING E

Timber roofing	(1*2*0,02=14m³
Roofing	650*2=1300m²
Brick cavity wall	(18,5*2)*4,6*0,1*2=34m³

BUILDING 9

Concrete foundation	26*1*0,2=5,2m³		
Steel H-columns	7*5*=35m		
Steel I-beams	3*10*=30m		
Steel roofing	160m²		
Roofing	160m²		
Steel cladding	(10*5+16*5)=130m2		
Truck door	3,5*3=10,5m²		

BUILDING 10

Steel I-beams	4*5,7*=22,8m		
Steel roofing	69m²		
Roofing	69m²		
Steel cladding	(5*5,7*2)=57m2		
Truck door	3*4=12m²		

BUILDING 11

Brick foundation	19,5*1*0,1*2=4m³	Windows (glass)	0,2*0,2*8=0,3m²
Concrete slabs	95*0,3=3m³	Concrete floor	95x0,2=19 m³
Timber roofing	95m²		
Roofing	95m²		
Brick cavity wall	(19,5*3,5)*0,1*2=14m³		
Windows	1*1*6=6m²		

REUSE / RECYCLE / DOWNCYCLE

REUSE: PRODUCTS LIKE BEAMS, CLADDING, TIMBER ETC. ARE TO BE SOLD IN THE CIRCULAR STORE AND REUSED BY THE PEOPLE

RECYCLE: MATERIALS LIKE BRICKS ARE COLLECTED, CLEANED AND RECYCLED FOR PAVEMENT AND SHAPING OF THE PUBLIC SPACE

DOWNCYCLE: (FOUNDATION) MATERIALS LIKE BRICKS AND CONCRETE ARE COLLECTED AND GRINDED TO FUNCTION AS SUPPORT FOR THE NEW DESIGN OF THE PUBLIC SPACE

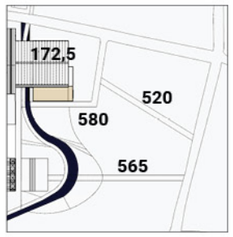
WASTE: A VERY SMALL PART OF THE MATERIALS LIKE ROOFING AND INSULATION WILL BE TREATED AS WASTE, WHERE IT IS NOT POSSIBLE TO USE THEM ANYMORE.

Concrete:

2,6 + 243 + 85 + 5,2 = **335 m³**

Brick:

(766+84,5) + 180 + 326 + 340 + 136 = **1833 m²**

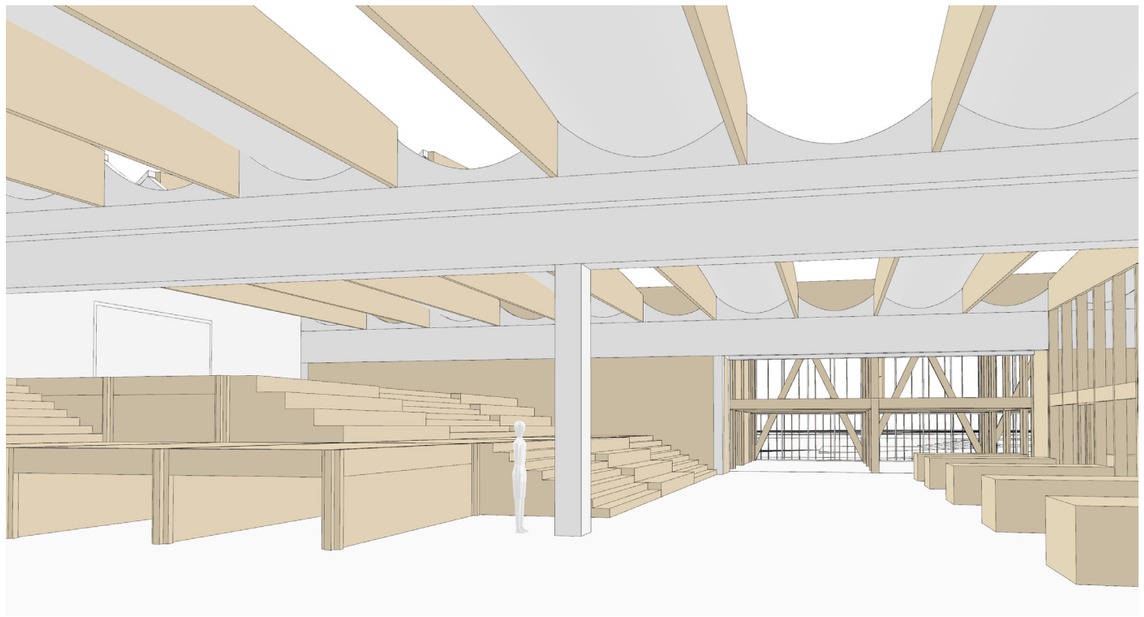


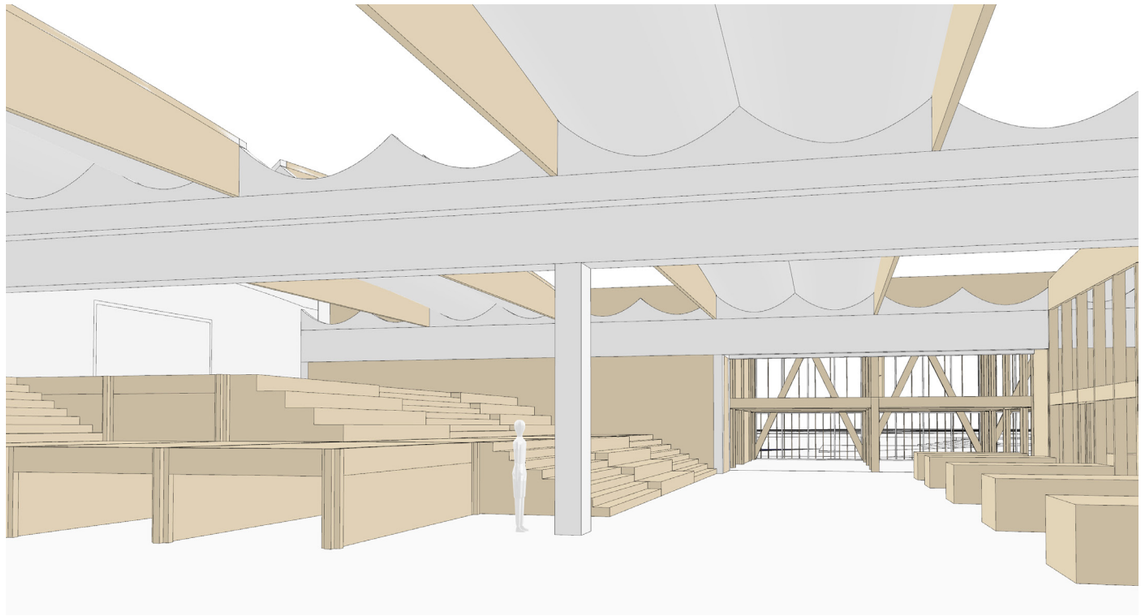
Brick:

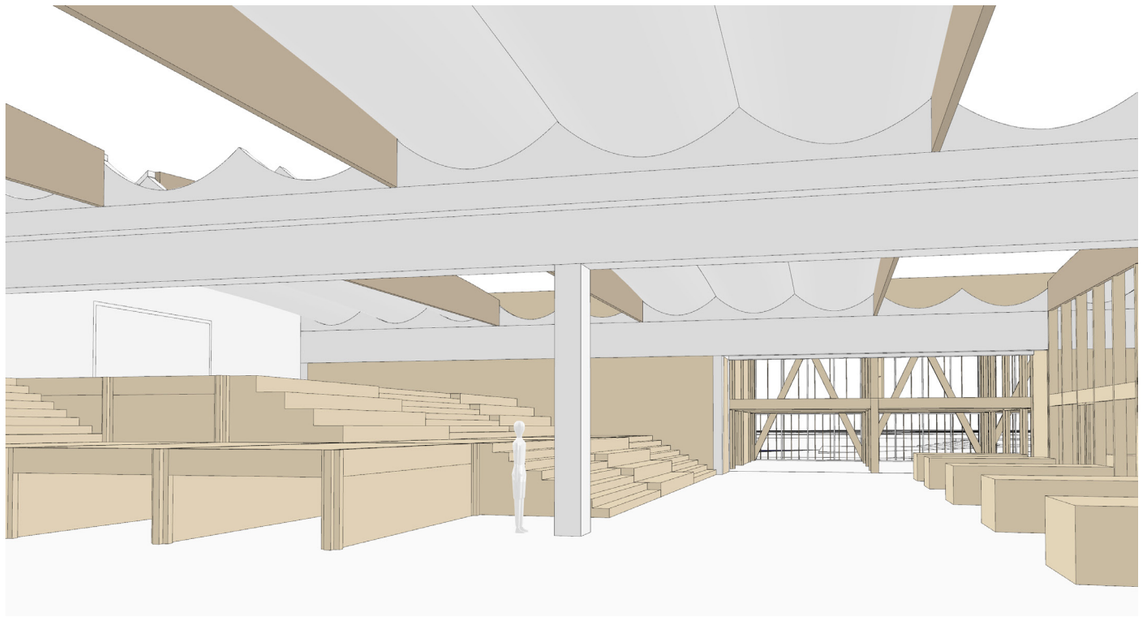
172,5 + 580 + 520 + 565 = **1837,5 m²**

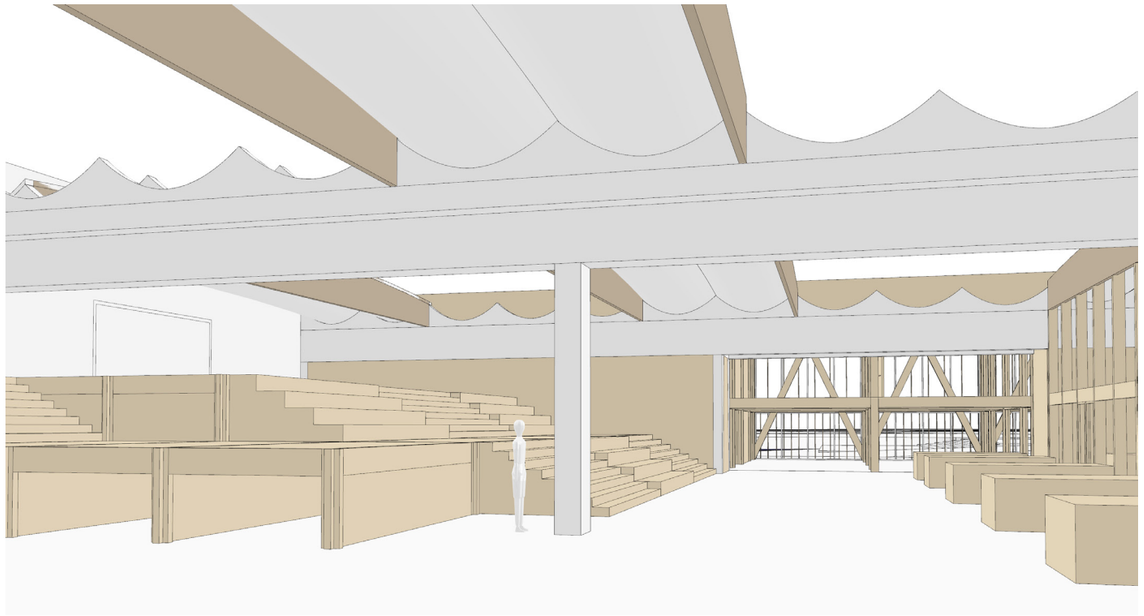
ARCHITECTURE

HP-SHELLS



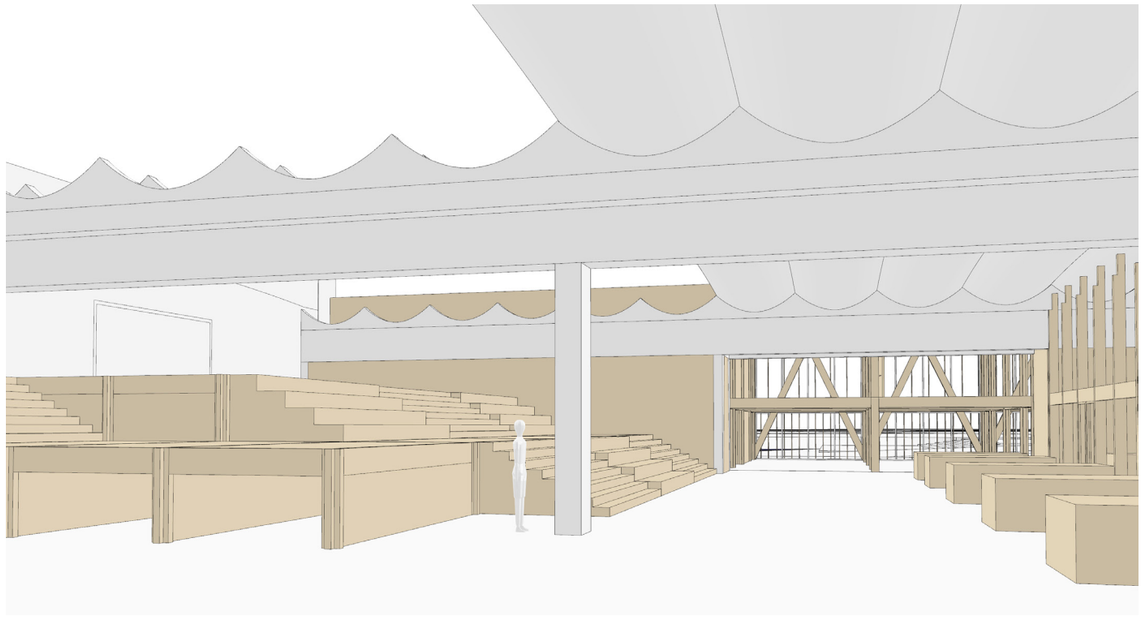


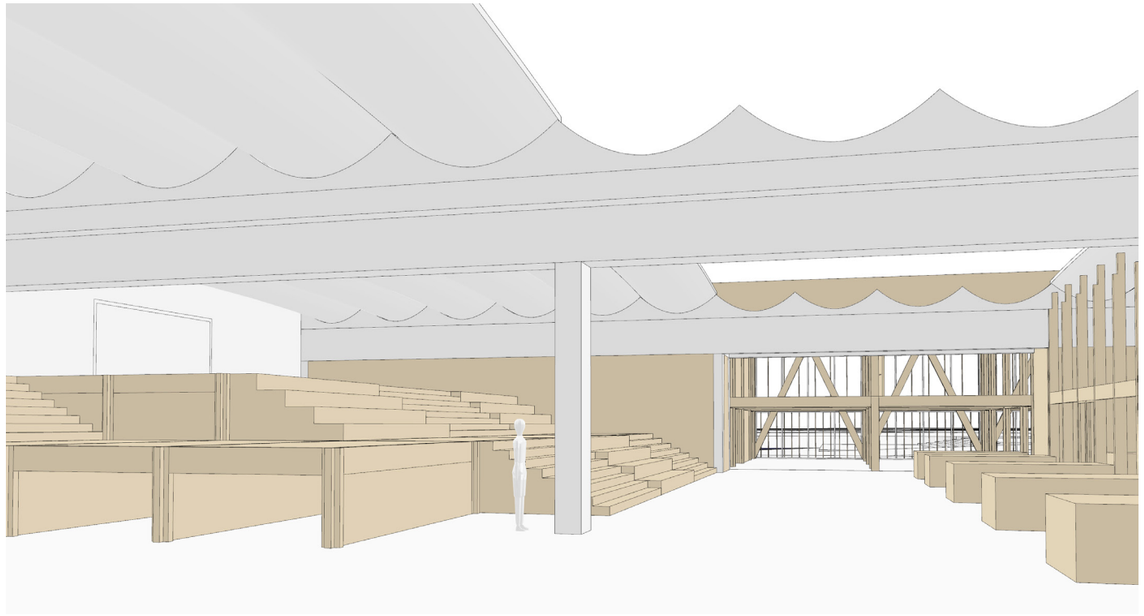


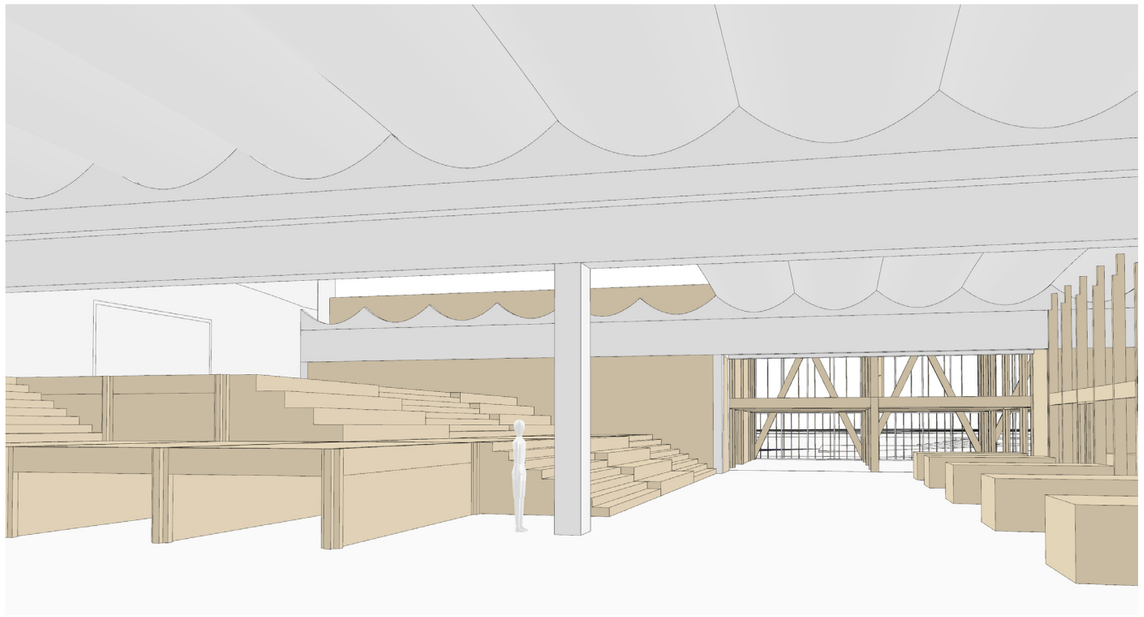


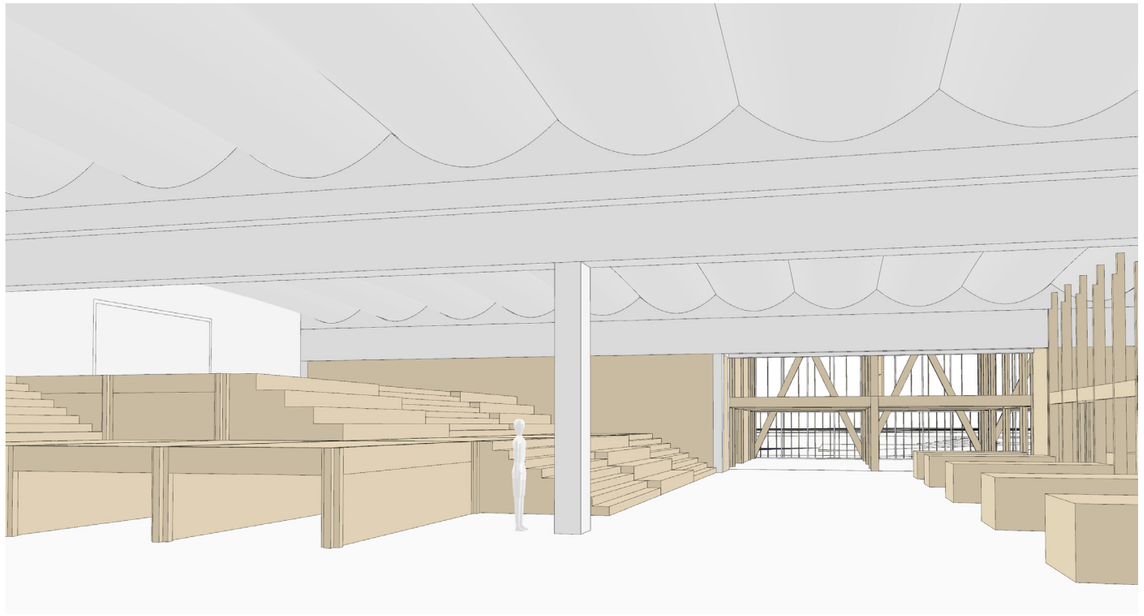
ARCHITECTURE

HP-SHELLS



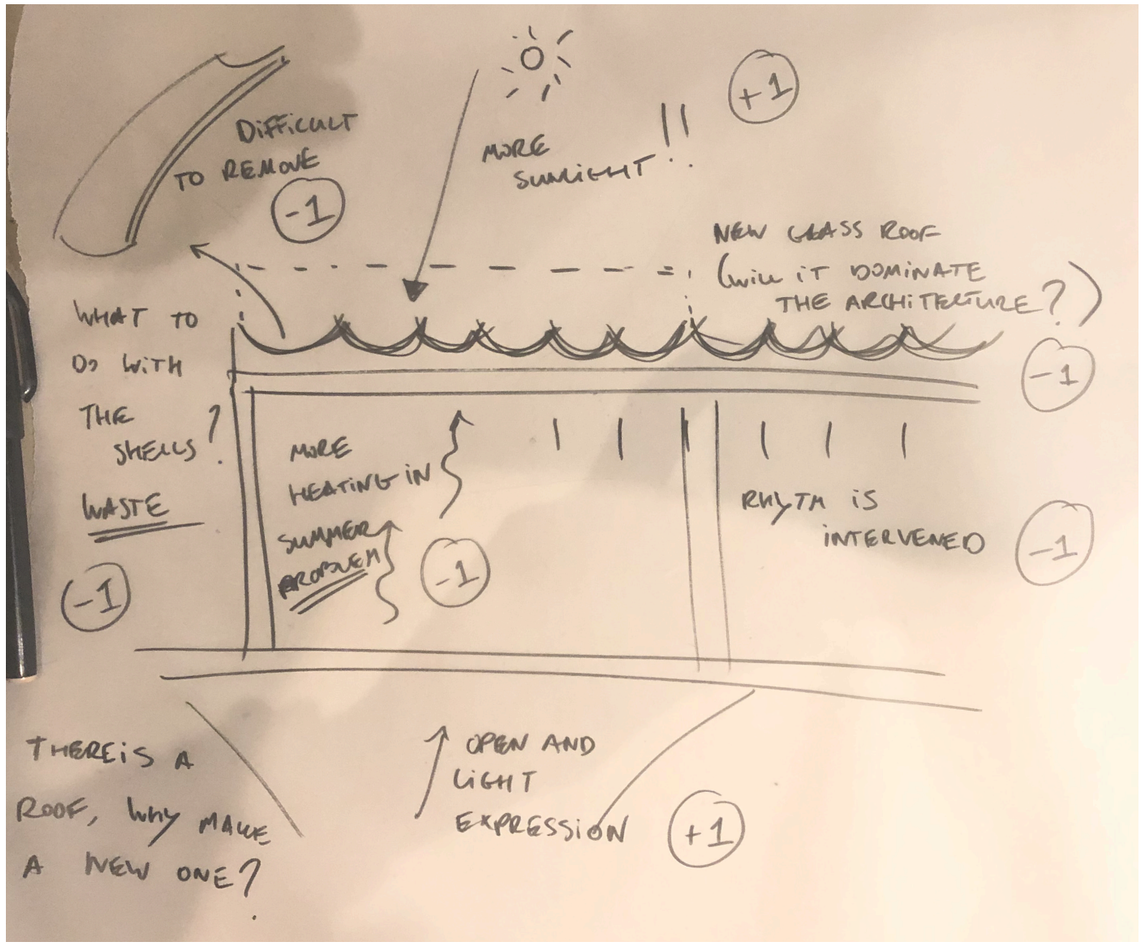


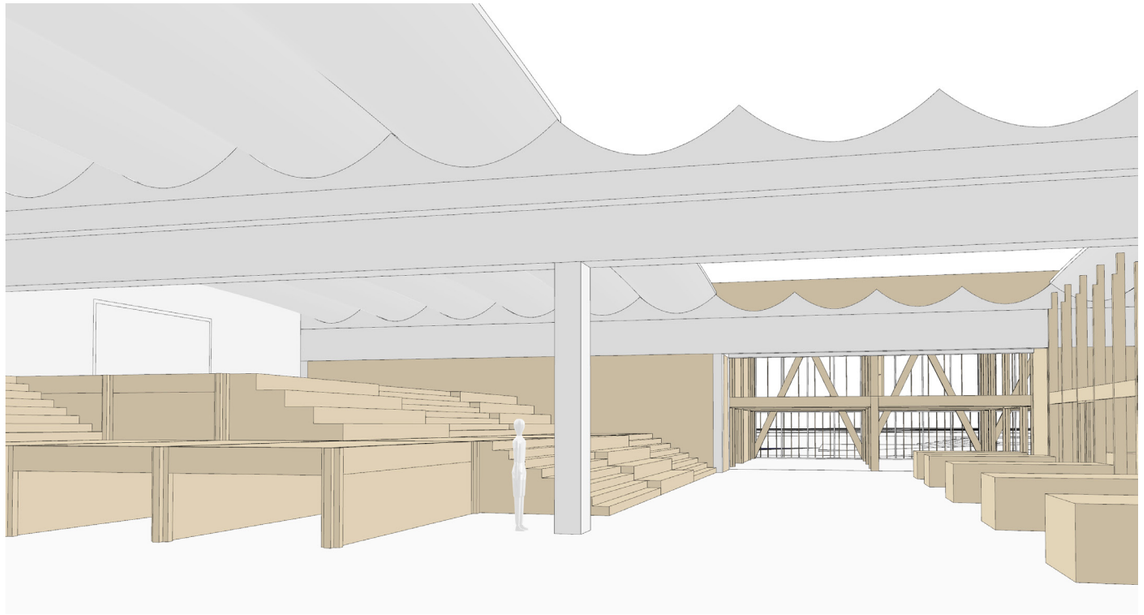


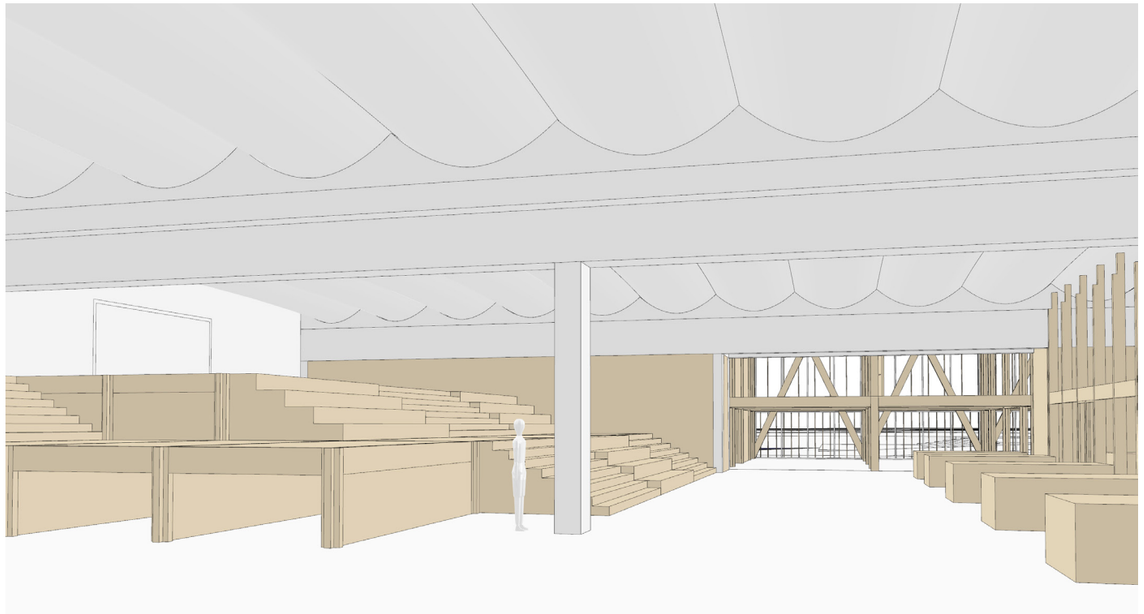


ARCHITECTURE

HP-SHELLS

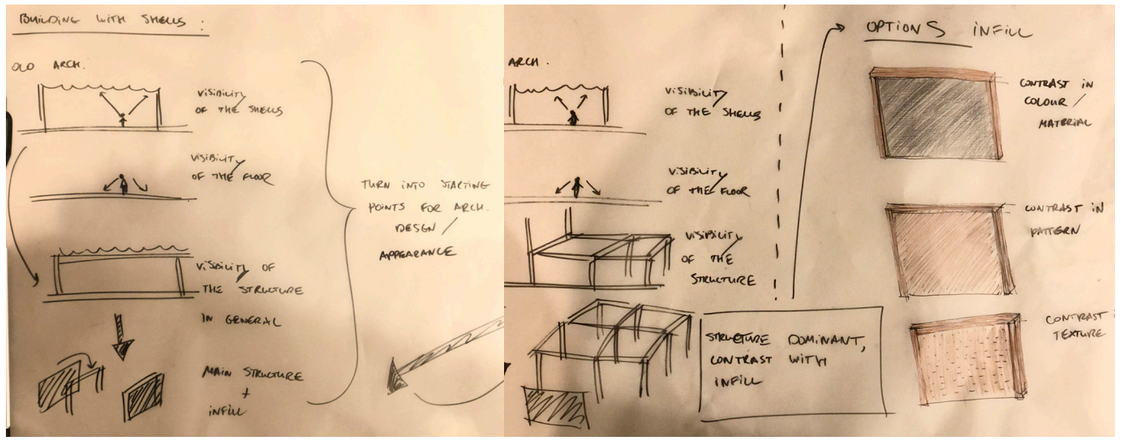


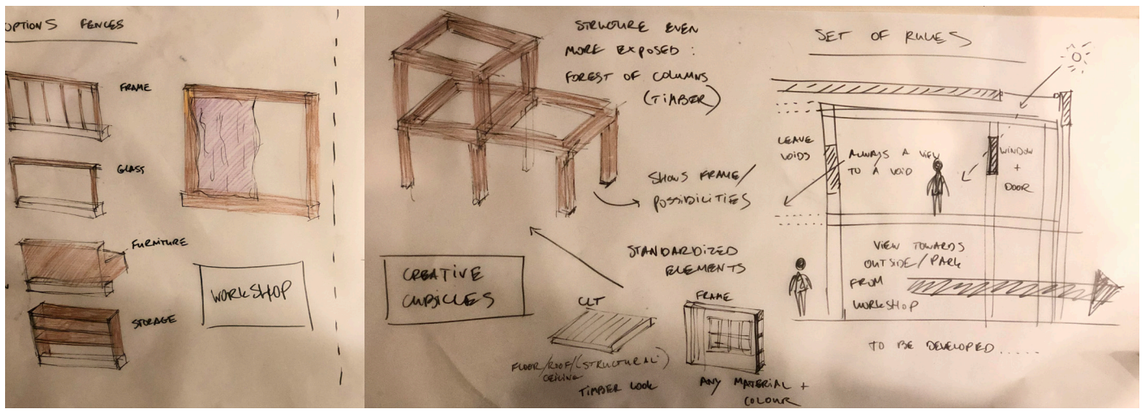


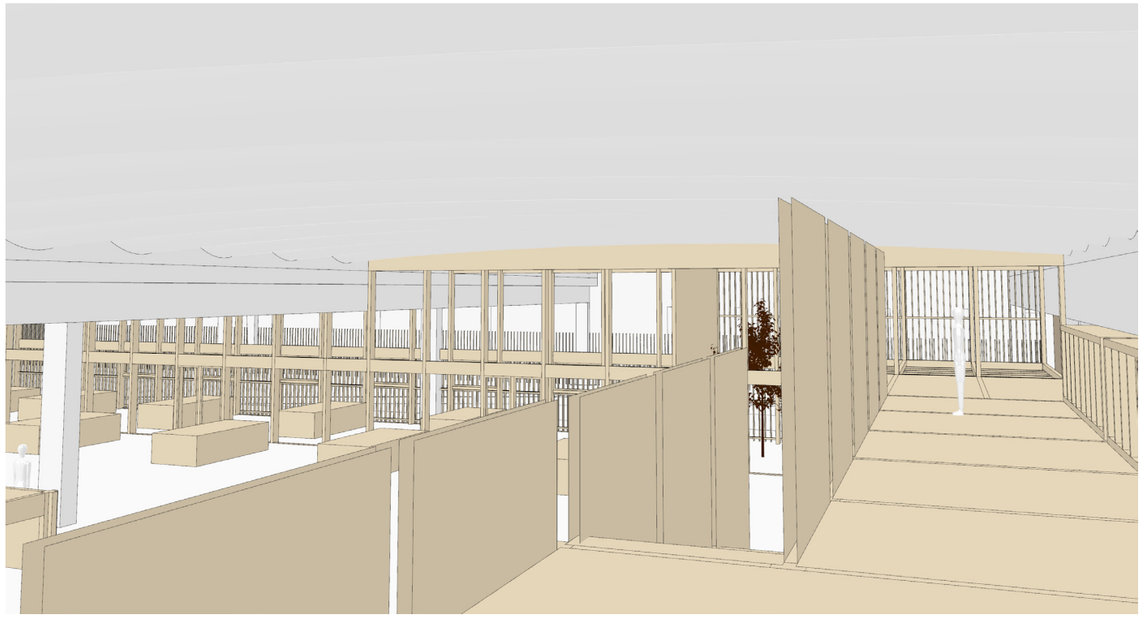


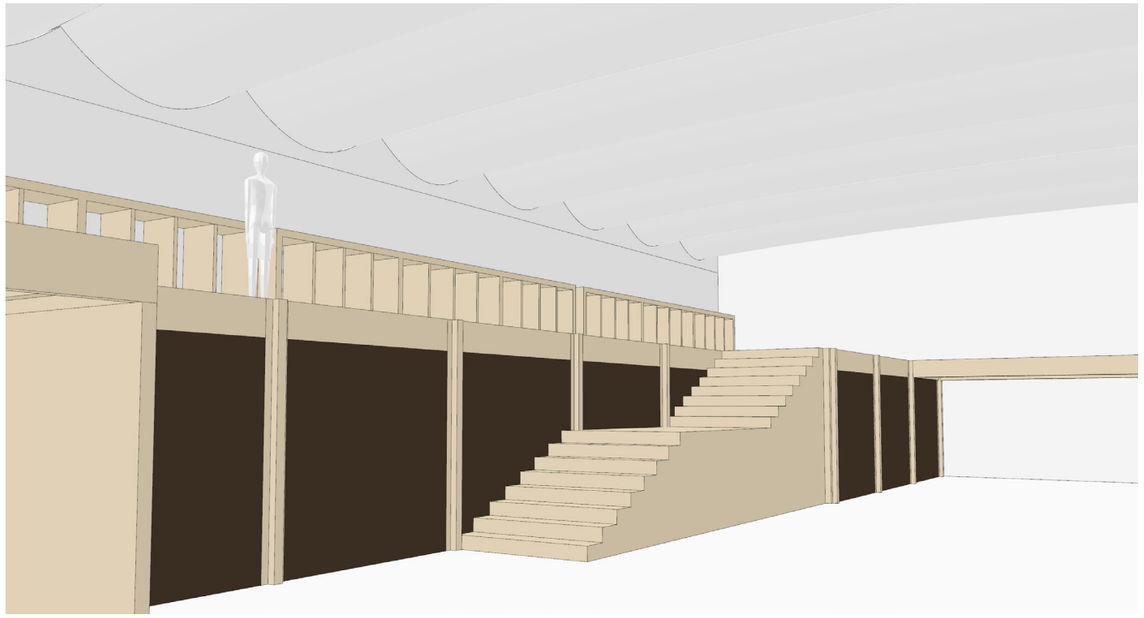
ARCHITECTURE

SCHEMES ARCHITECTURAL CONCEPT







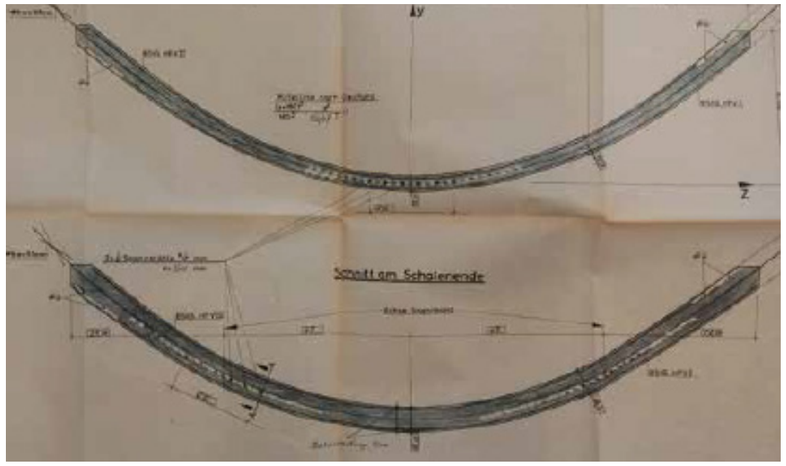


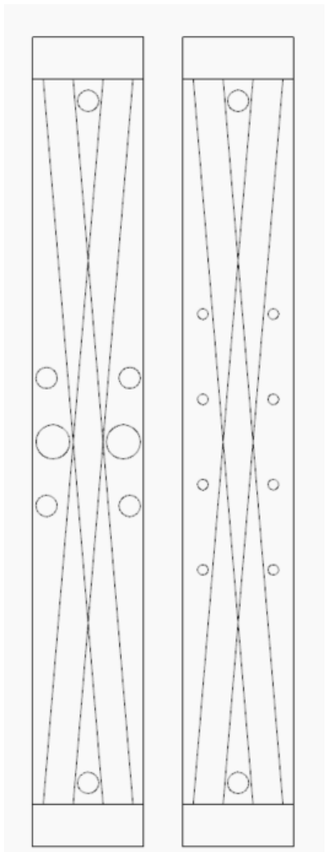
TIMBER TOWN

16-04-2020

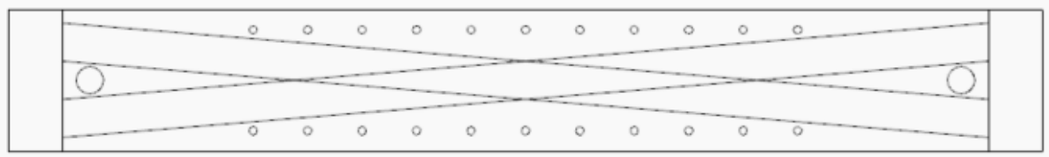
ARCHITECTURE

HP-SHELLS AND SMALL ROOFLIGHT POSSIBILITIES

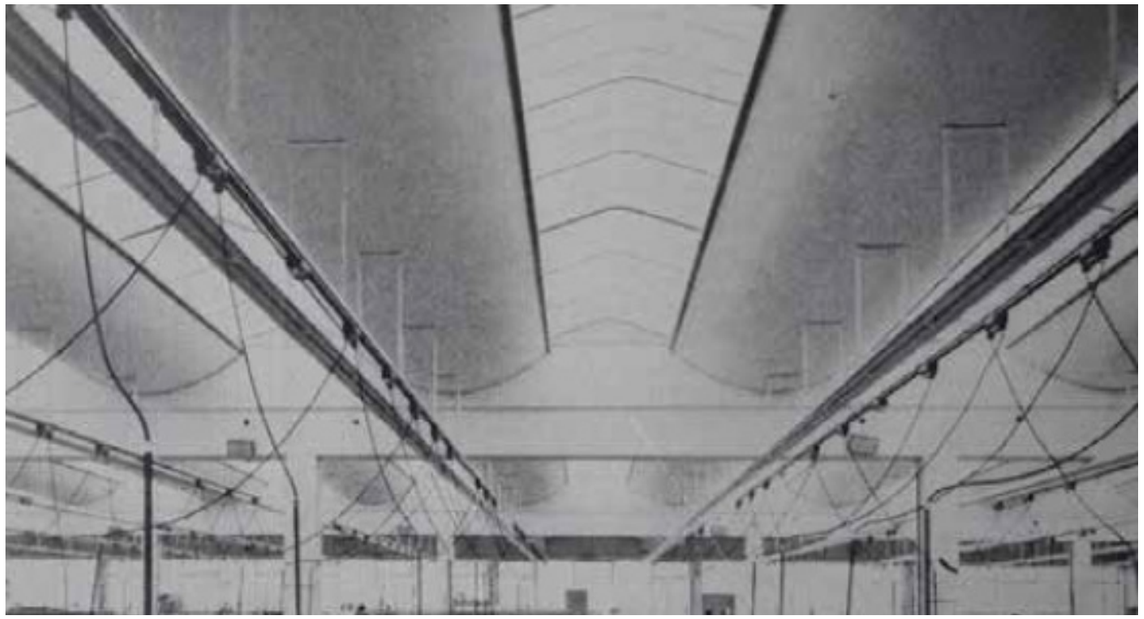




Prestressing of the HP shells and possibilities for small roof lights

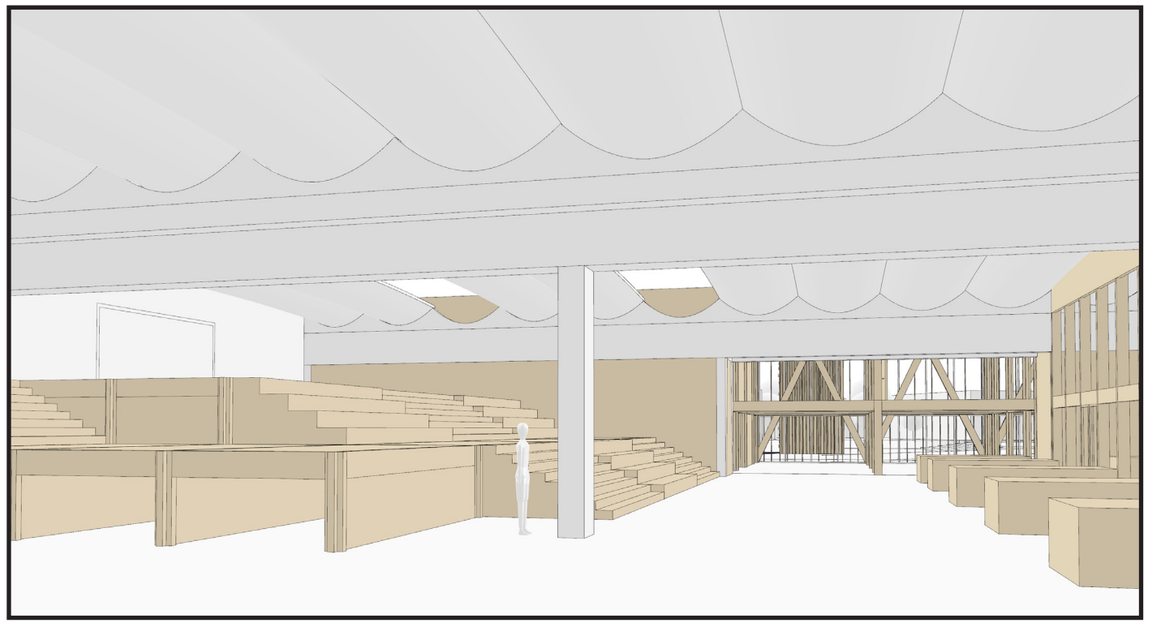


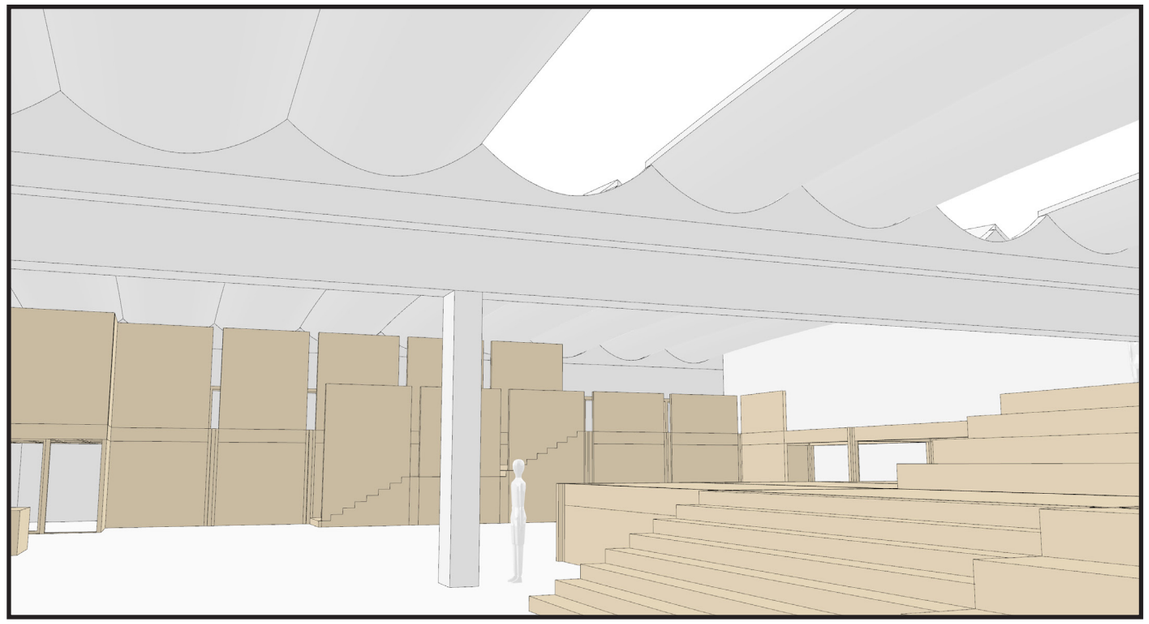
HP-SHELLS AND BIG ROOFLIGHT POSSIBILITES

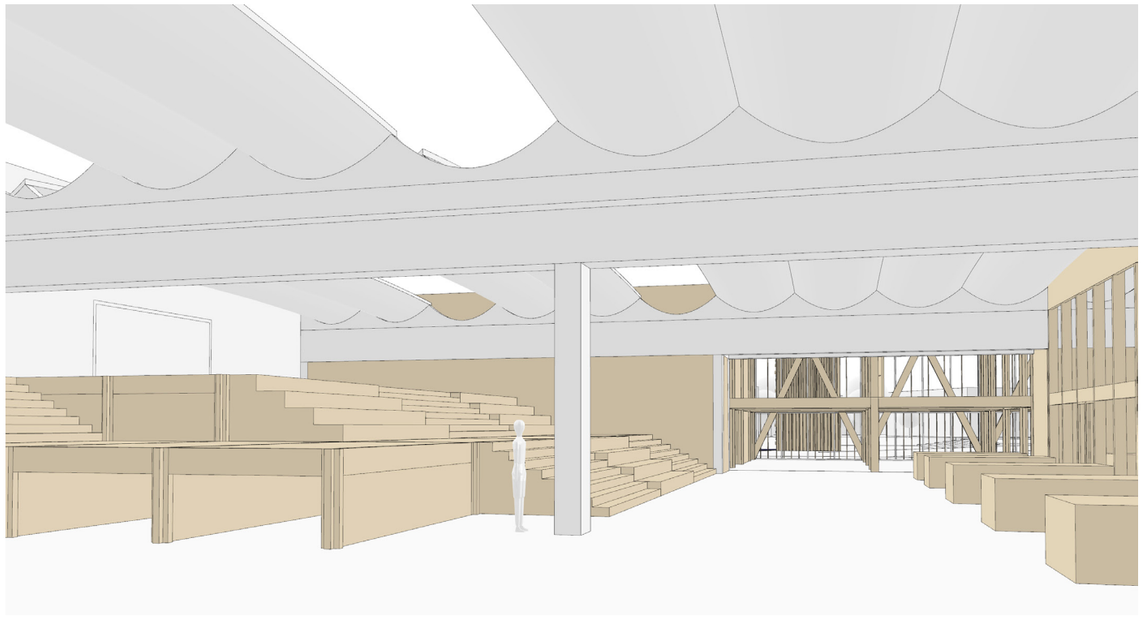


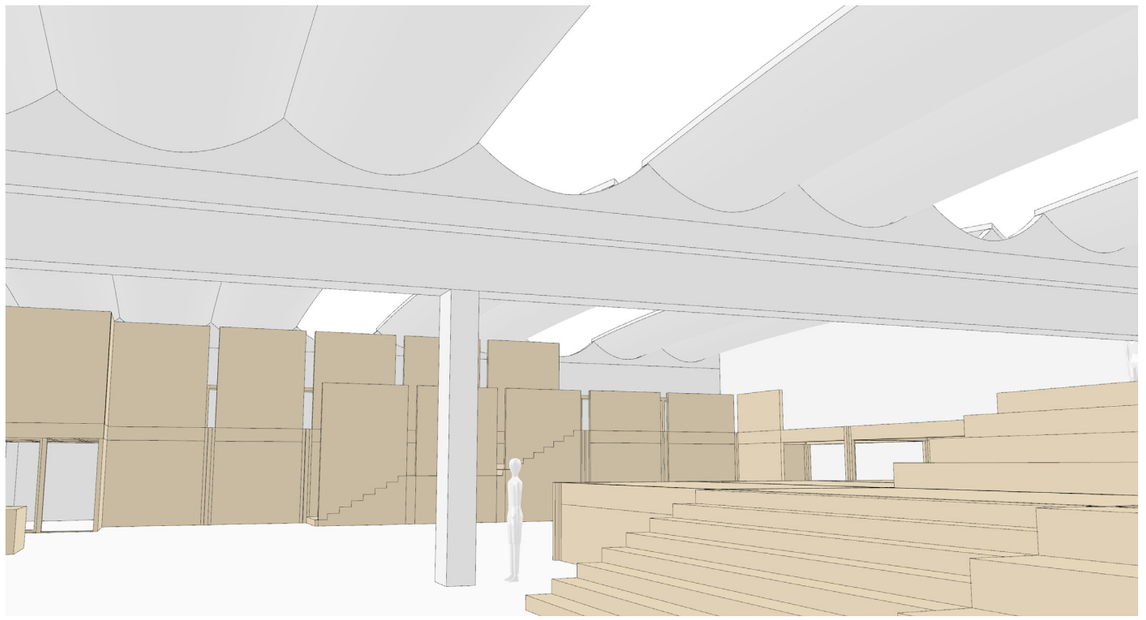
ARCHITECTURE

HP-SHELLS AND SMALL ROOFLIFHTS OPTIONS



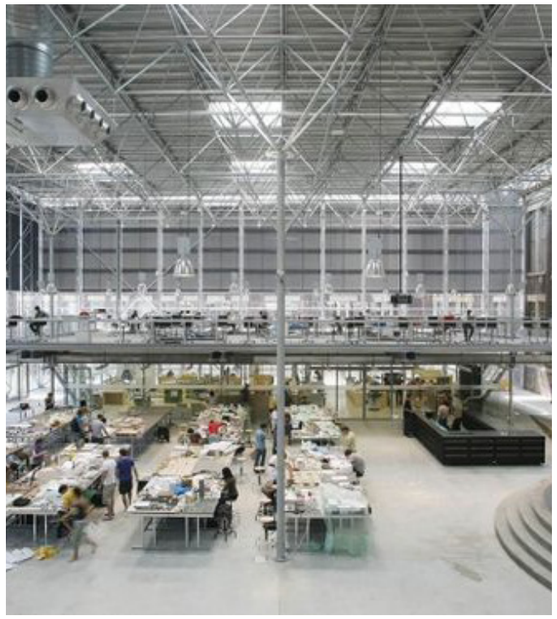


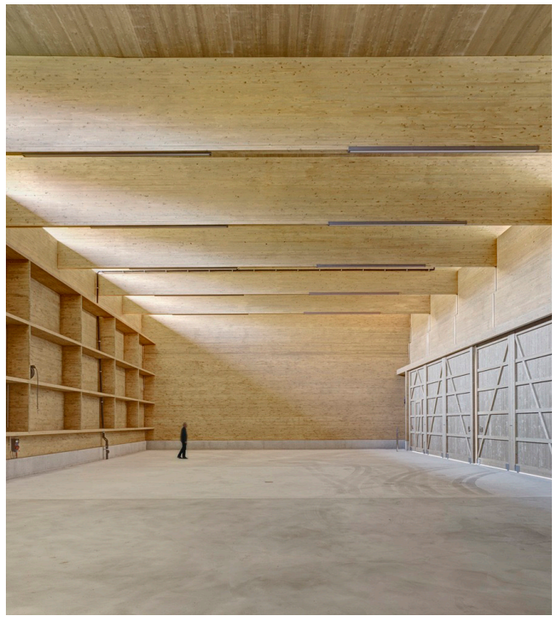


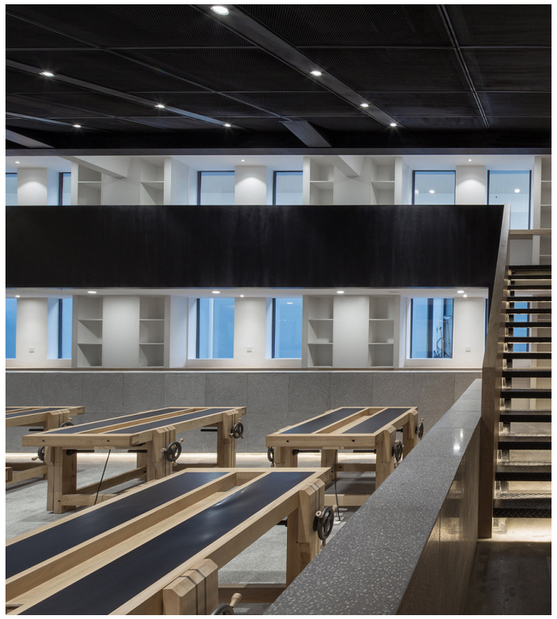


ARCHITECTURE

HP-SHELLS AND POSSIBILITIES







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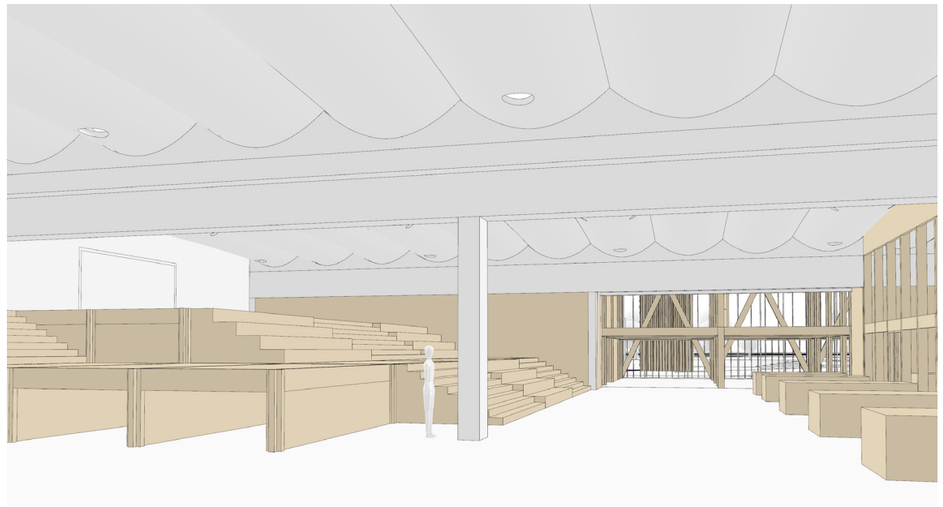
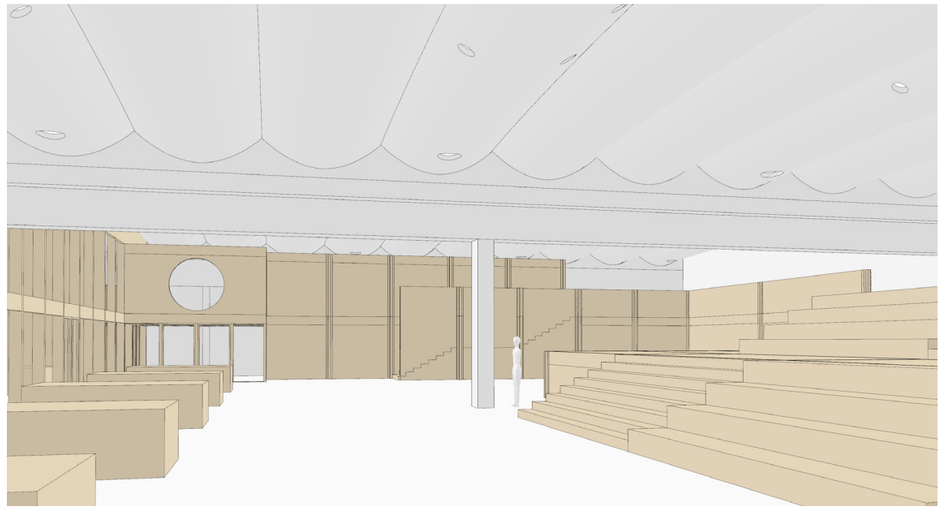
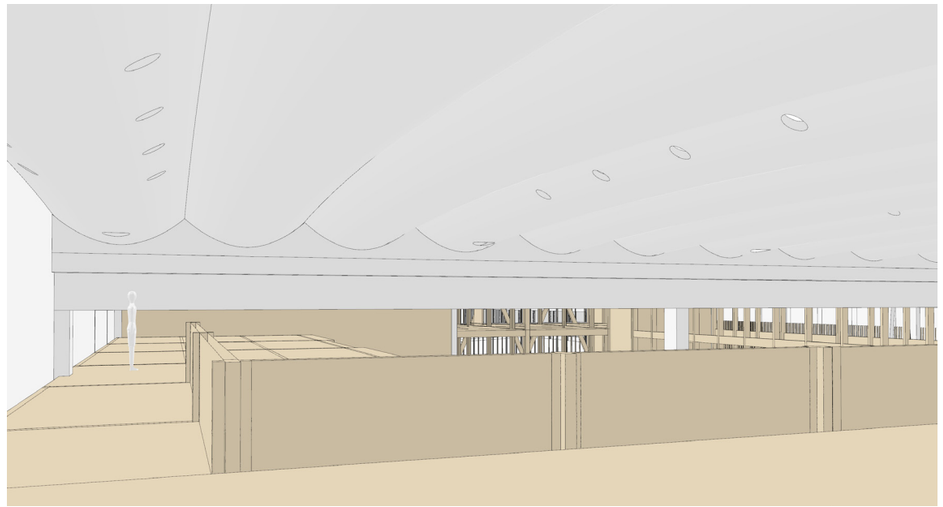
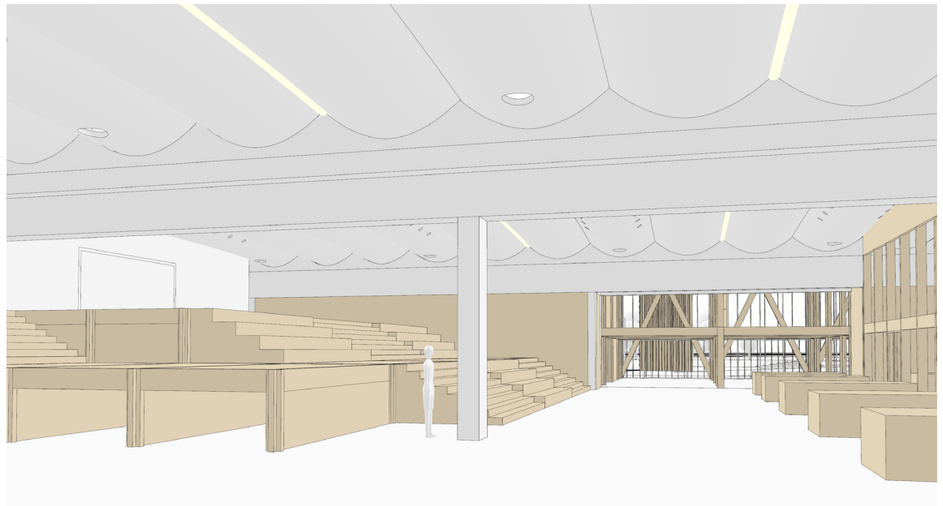


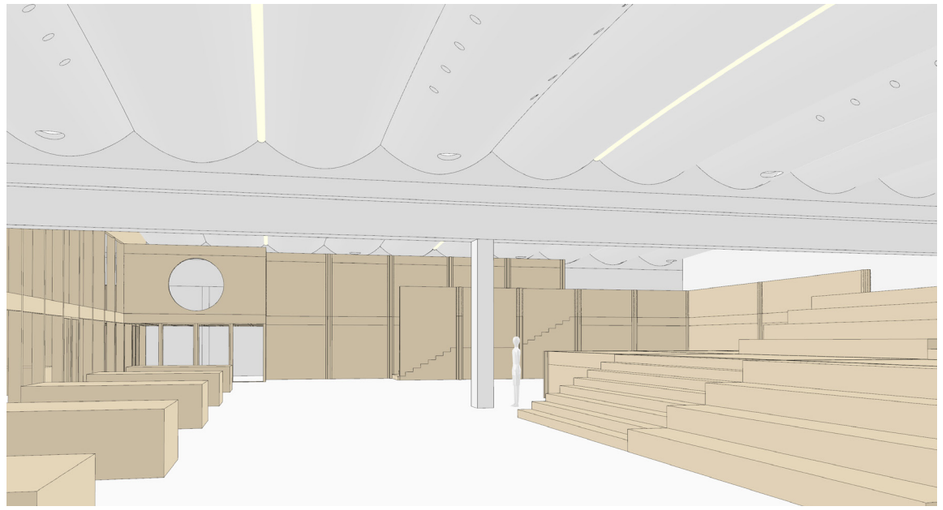


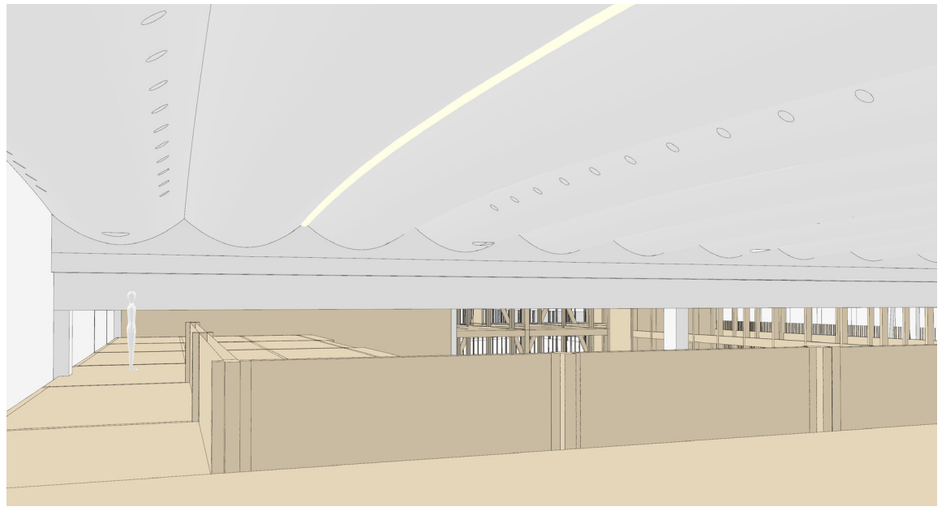


ARCHITECTURE

B







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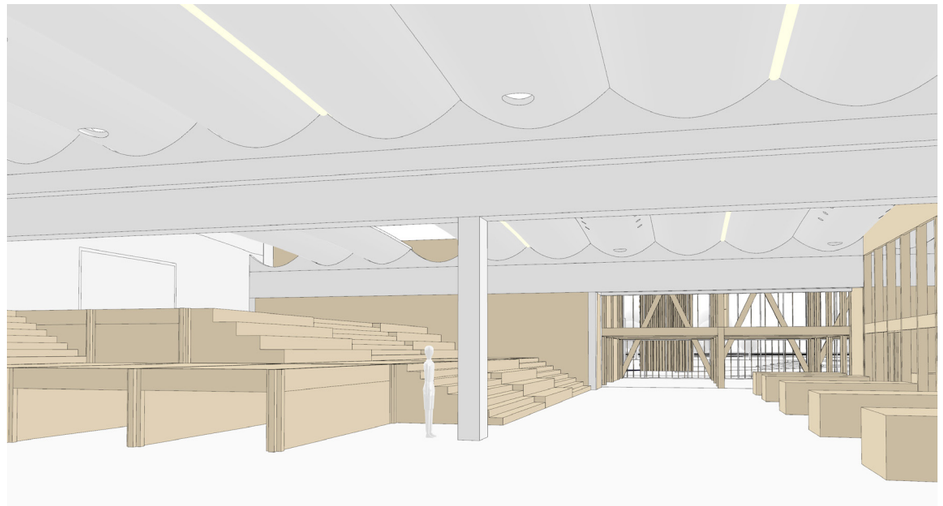
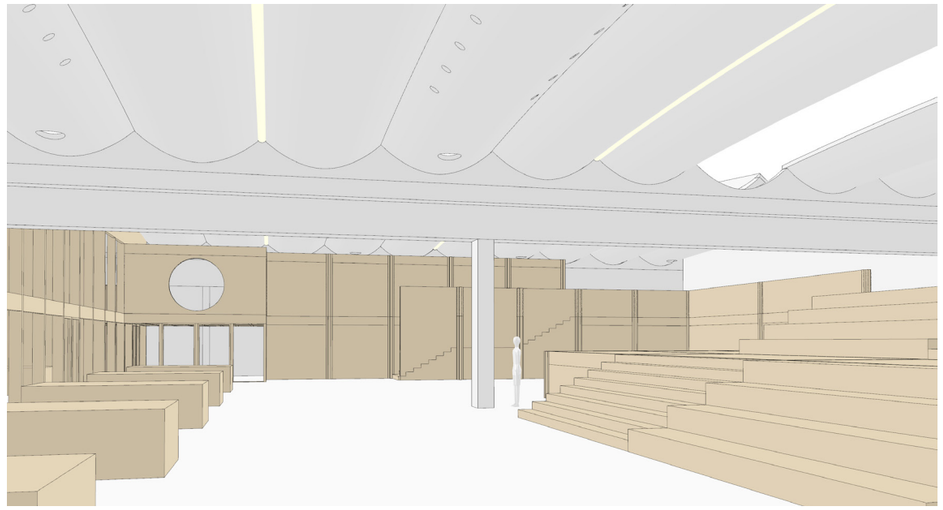


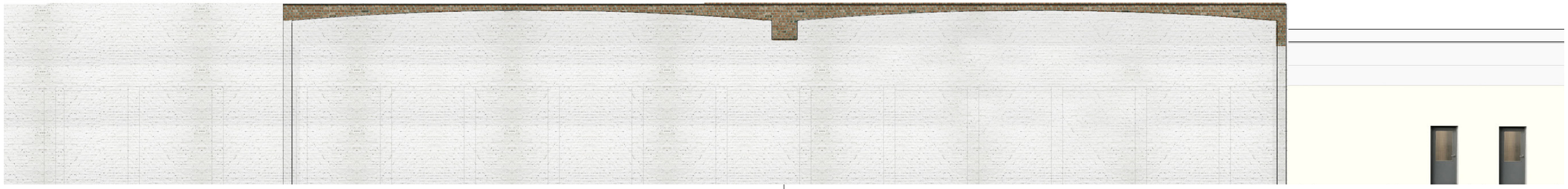


ARCHITECTURE

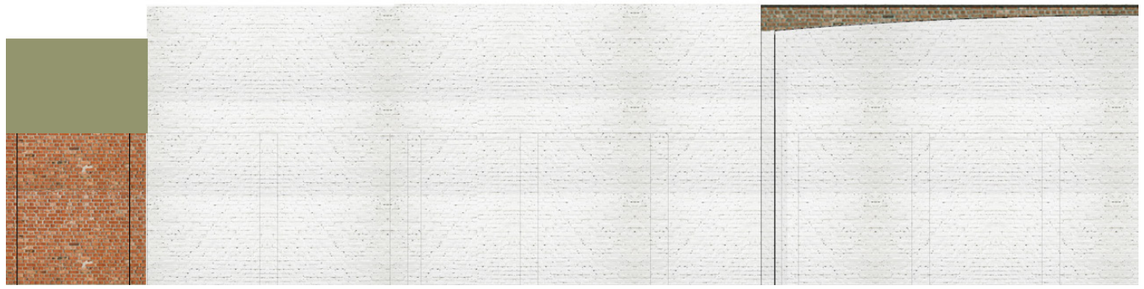
FAÇADE - SHEDS

EAST

- Authentic brick façade --> Keep big part of this appearance
- Recieves not that much sunlight
- Garage door is important for transportation of materials and goods for the shop
- Insulation possible on the inside



SOUTH

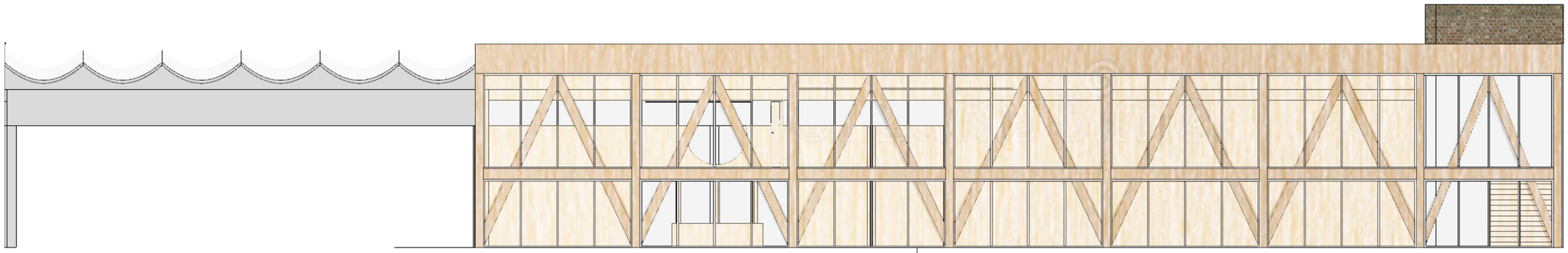


SOUTH

- White painted bricks (interior façade) --> More likely to touch than the East façade
- South, but recieves almost nog sunlight due to the shells building
- Two authentic doors are important to keep: public entrance of the shop
- Insulation possible on the inside
- A distance of 6040 mm in between beams which are supported by the brick wall.
- Openings of 2800 in between pilasters best option

ARCHITECTURE

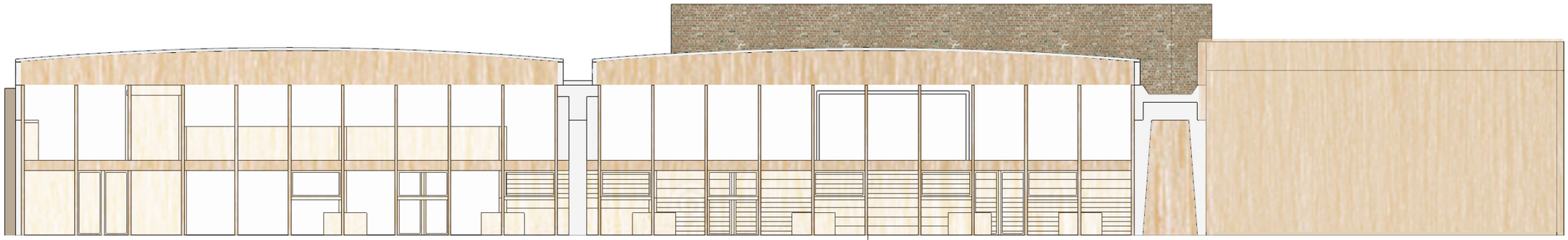
FAÇADE - NEW PART



WEST

- New façade
- West, receives sunlight during the afternoon and evening
- Glass to create openness towards te park
- Glass functions as thermal shell

FAÇADE - D

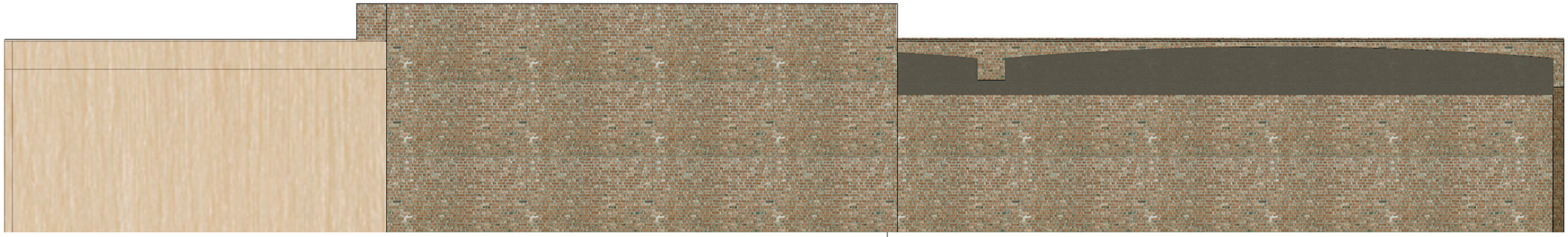


NORTH

- New façade
- North, receives no direct sunlight
- Glass to create openness towards te main important route
- Glass functions as thermal shell

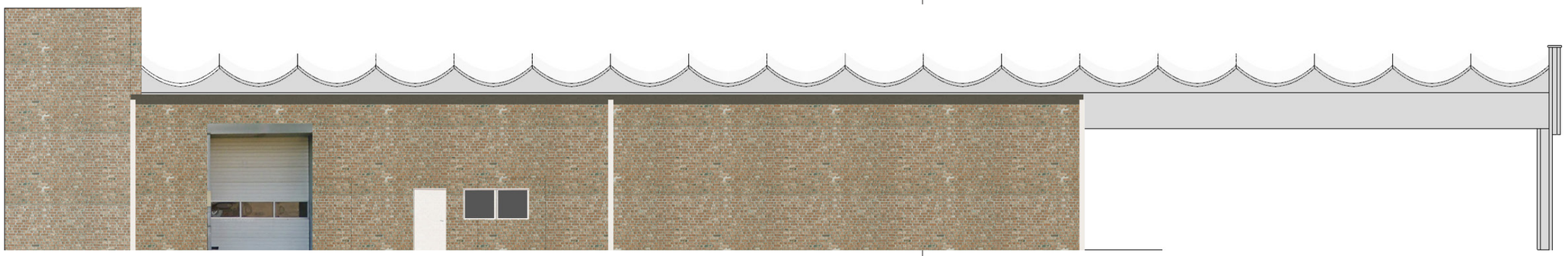
ARCHITECTURE

FAÇADE - D



SOUTH

- Façade closed, needs patching up on the addition: removing windows and replacing them with brick
- Façade not very prominently visible from the street
- South, is receiving sunlight the whole day
- Insulation on the outside to keep the old appearance on the inside



EAST

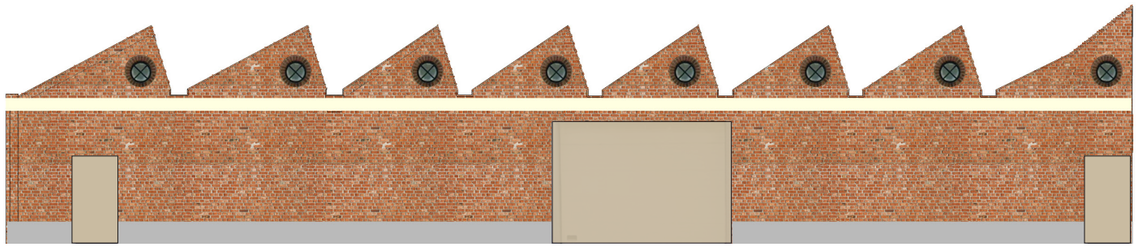
- Façade shows cracks on some spots, they need to be repared or covered
- East, doesn't receive a lot of sunilght during the day
- Rain water drainage very visible in view, not a nice appearance
- Shape of shells very visible from the street and important for the architectural appearance of the building

ARCHITECTURE

- Synthesis and flexibility
- For this the phasing and users are leading: the idea is that there is a base condition which can be tweaked throughout time and by the individual user

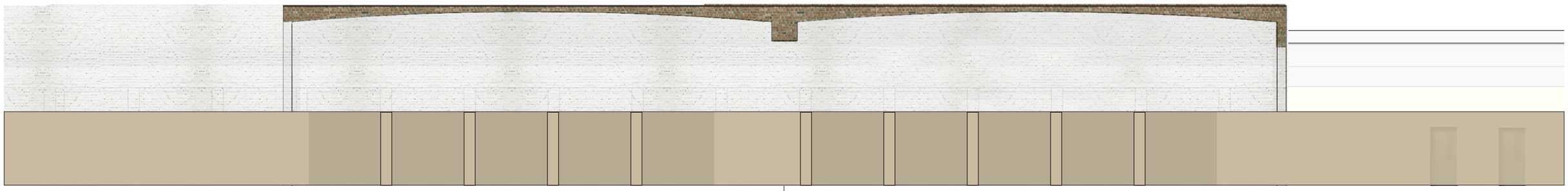
- Changing use over time and moving functions around to expand. Meaning for the facade to be adaptable to the function of a certain moment in time: the smart timber wrap. For the interior of the buildings, this adaptability in the first place means that the whole structure is modular and demountable, but also that different spaces are designed in such a way that they can change function. Because of this and the smaller configuration of the first phases, some functions are put together that might interfere with each other on the level of sound.

FAÇADE - SMART TIMBER WRAP (STW)



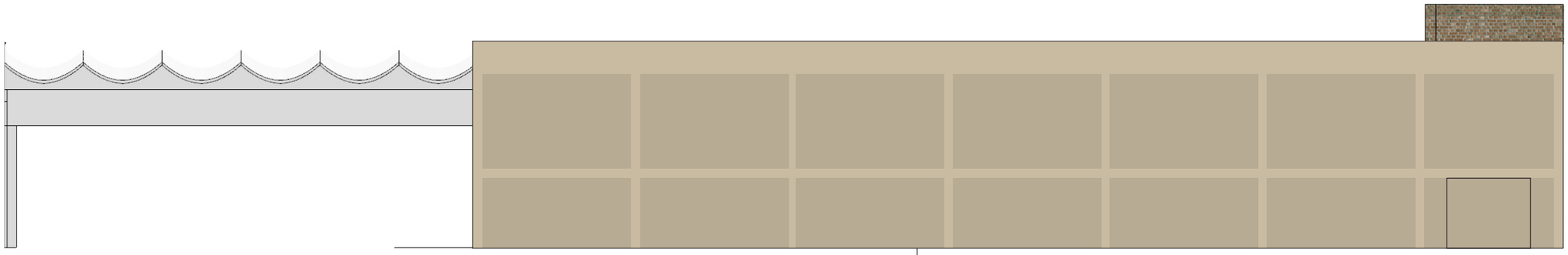
- Covering ratio of the STW dependent of the value of the façade, the need of restoration and functionality

- Issues are solved with the STW: Hidden gutters and rainwater drainage, insulation, shading, adjustability, flexbibility, patching up/restoration, openings in the façade



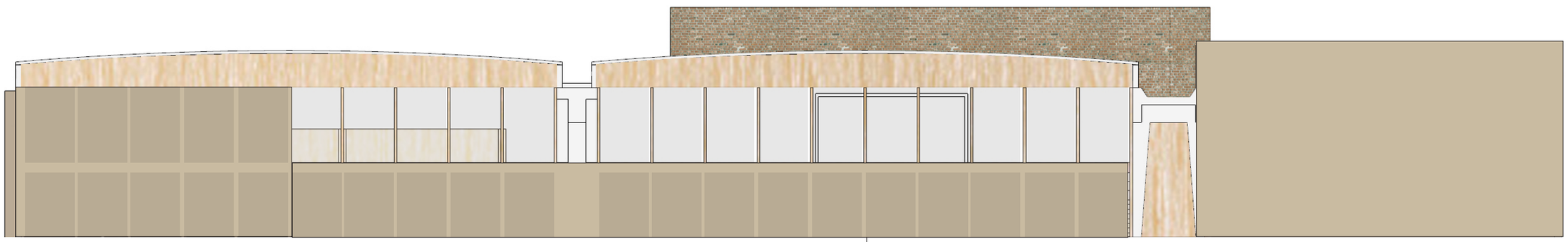
STW (closed, semi-closed, open):

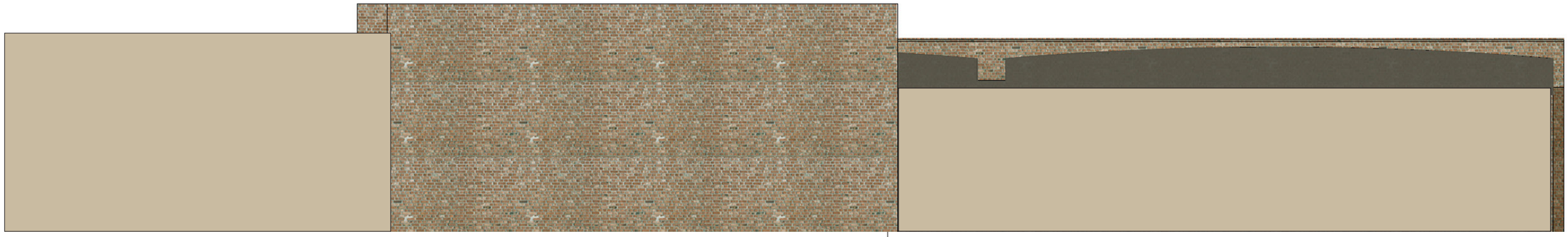
- Fixed:	insulation no insulation	>> fixed function façade
- Moving:	sliding folding rotating	>> flexible function

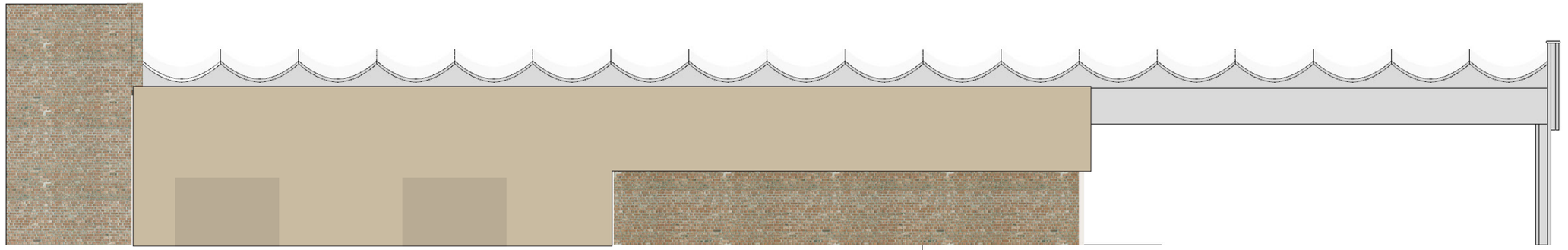


ARCHITECTURE

FAÇADE - SMART TIMBER WRAP

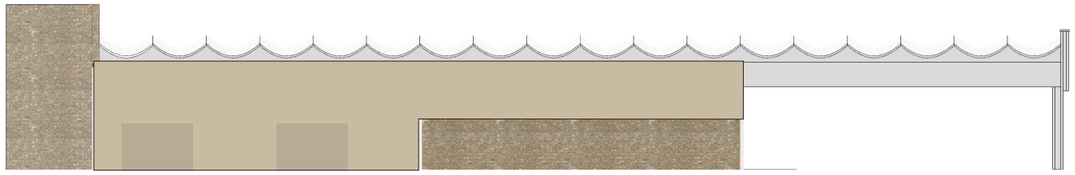






ARCHITECTURE

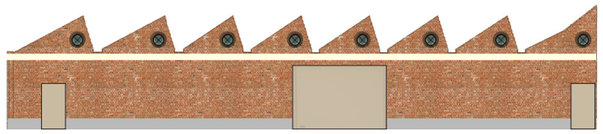
FAÇADE - SMART TIMBER WRAP (EAST)



FUNCTION: TIMBER WORKSHOP

- For the workshop, it is important to have heavy and well (sound) insulating walls without too much perforations. For that reason as much as possible from this façade is kept closed.
- Here the timber wrap contains insulation at some points. It also patches up bad brickwork, new/old openings and integrates big garage doors. A bigger part with timber cladding is allowed because of the lower valued façade.

FAÇADE - SMART TIMBER WRAP (EAST)



FUNCTION: CIRCULAR SHOP, EXHIBITION, MARKETPLACE ETC.

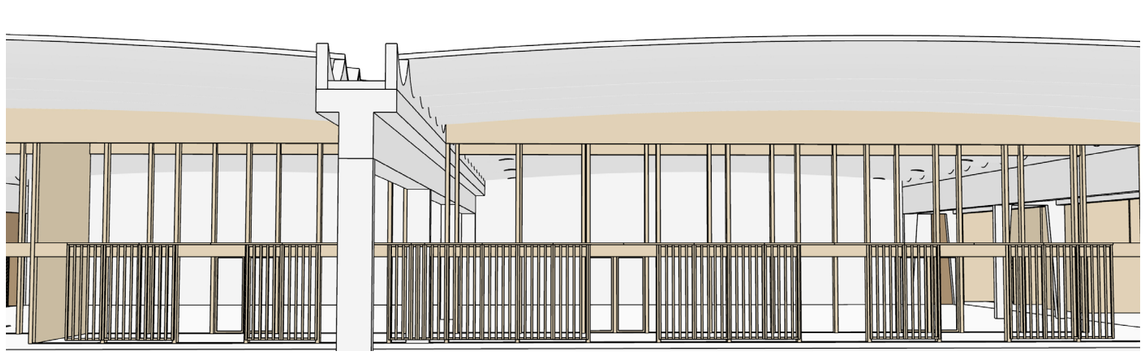
- This façade is valued highly and important and therefore will be touched as less as possible. Also the brickwork etc. is still in a good condition. Insulation will be added on the inside, since these walls are already plastered.
- The only adjustments to this façade is the new doors and garage door, which will be done in the same style as the ones on the other East façade.

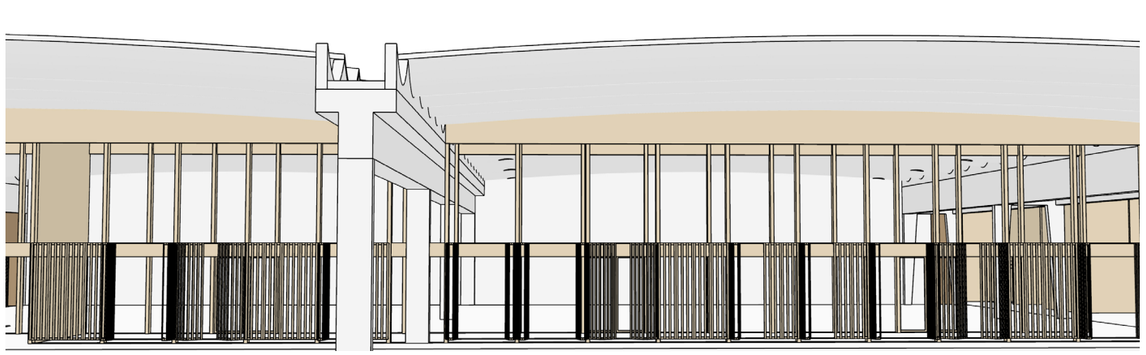
ARCHITECTURE

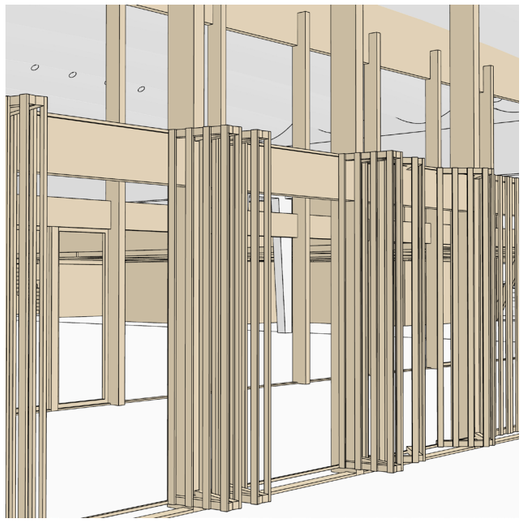
FAÇADE - SMART TIMBER WRAP (D, NORTH)

FUNCTION: EXHIBITION AND WORKING AREA

- For an exhibition products will have to be showcased: big glass parts are important
- For the working area, the façade can be closed a bit more to provide more privacy if wanted
  >> From semi-open to open







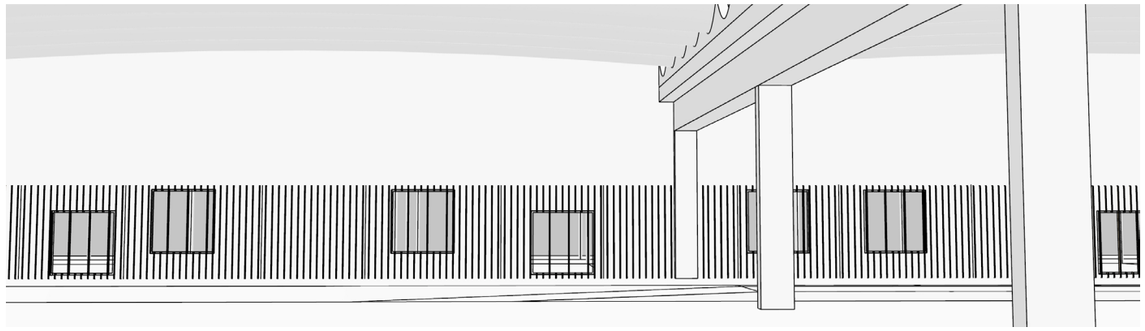
ARCHITECTURE

FAÇADE - SMART TIMBER WRAP (D, NORTH): OPTION 1

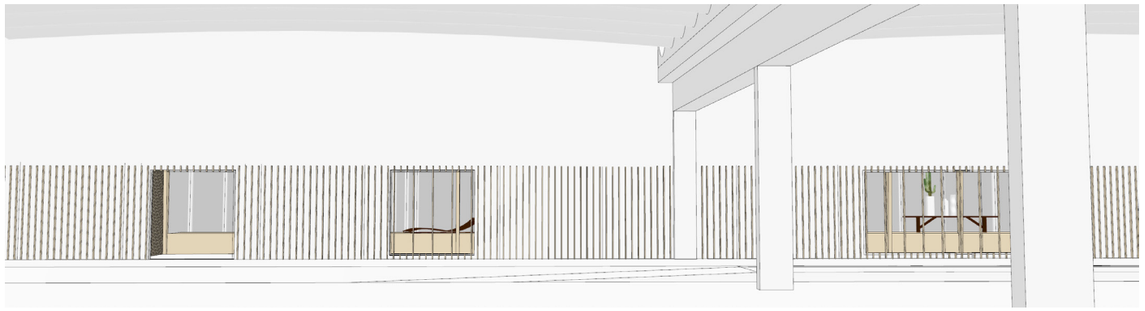
FUNCTION: EXHIBITION / SHOP / SHOWCASE

- For an exhibition products will have to be showcased: big glass parts are important
- Since the façade is an important one for the newly proposed route, the idea is to attract visitors to the building (also keeping the Circular Shop in mind)

As the shed roof building in every stage partly functions as an exhibition space, the façade asks for a certain level of openness. At the moment this is not provided, with the wall completely closed and functioning as a loadbearing element.
For the buliding to be able to house an exhibition function, the façade needs to have a certain level of openness. That is why in this version multiple openings are created, for the passenger to be able to peek inside and get a glimpse of the exhibition.

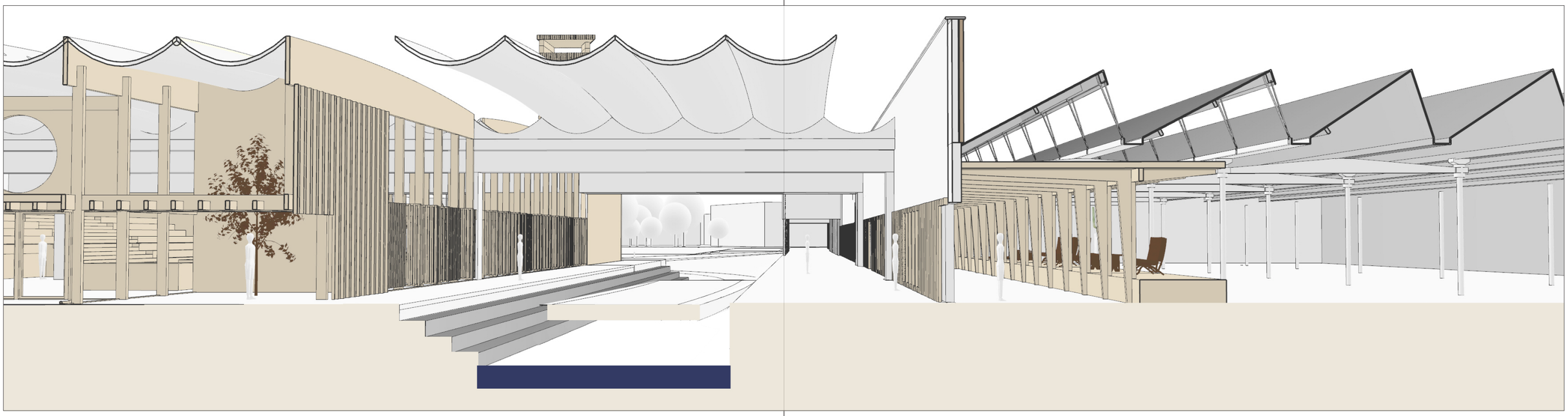


This option explores the situation where an internal art gallery / corridor is introduced. In this way less openings in the façade have to be made. This is beneficial for the whole wall, where it is supporting the cast iron beams and also a thick wall which was built on top of the existing wall.
The corridor also provides for an intermediate space between outside and inside and fits well into the sequence of spaces moving from outside the ensemble inwards underneath the shells, then to the corridor and then inside the building. The exhibition functions as a showcase where the exhibitioned items are very well exposed behind big glass parts and by loads of daylight coming in through the sheds.



ARCHITECTURE

FAÇADE AND INTERNAL ART GALLERY (ARCADE)



248

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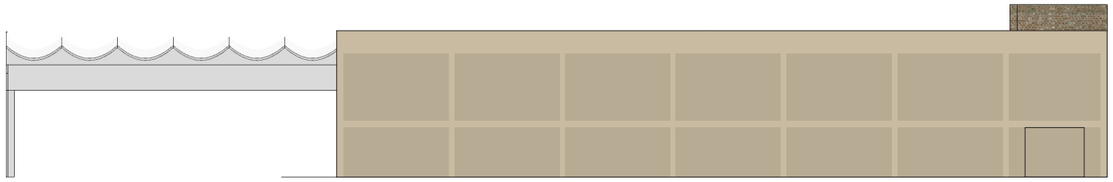
ARCHITECTURE

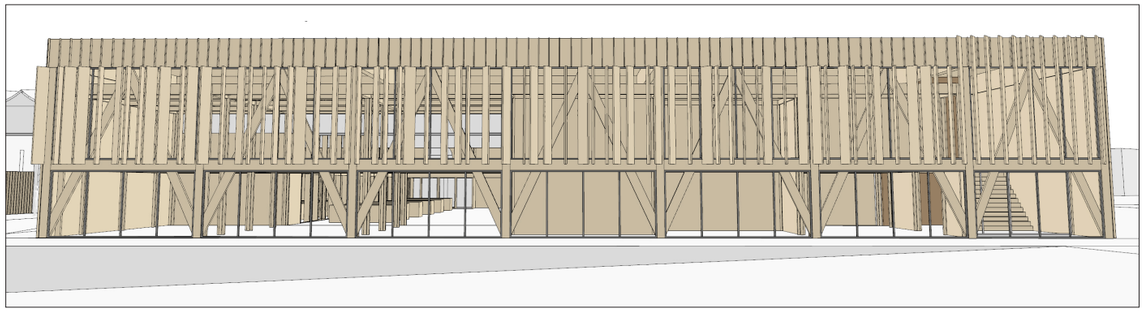
FAÇADE - SMART TIMBER WRAP (D, NORTH)

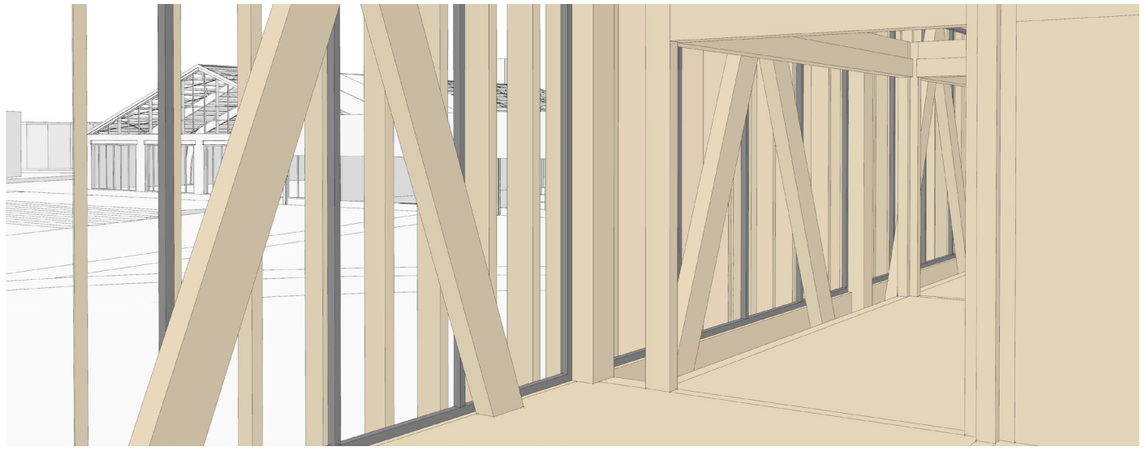


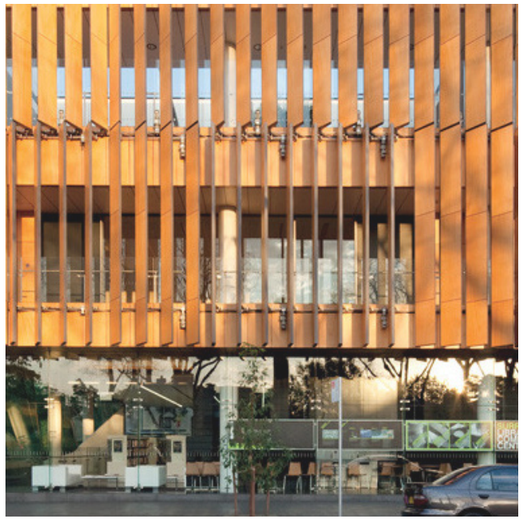
FUNCTION: CREATIVE CUBICLES (ATELIERS) AND EXPERIMENTING AREA

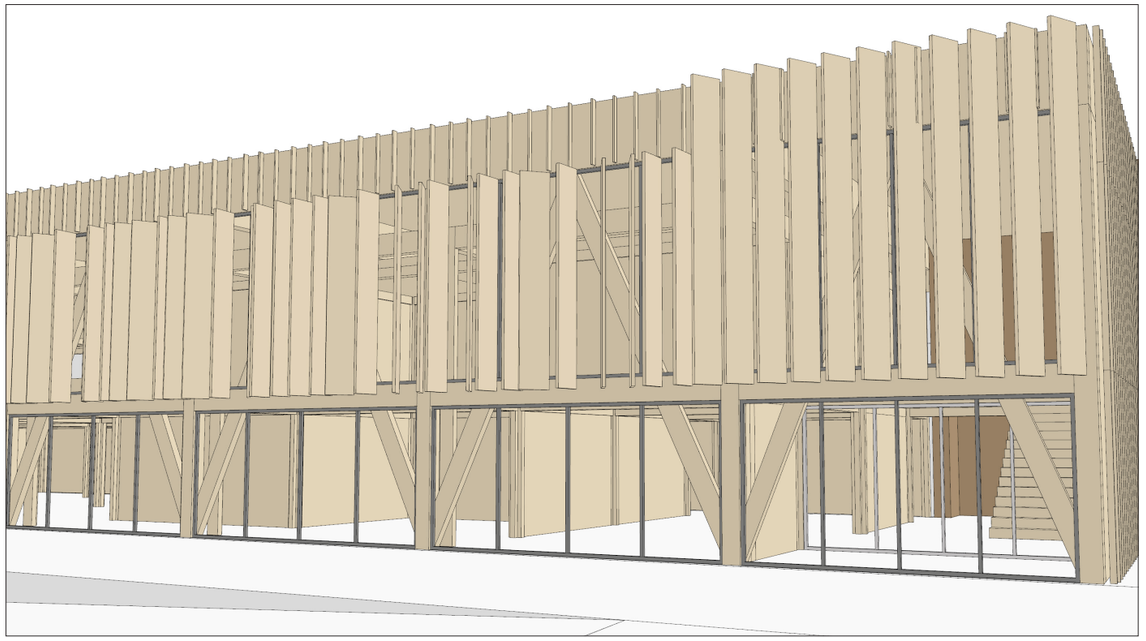
- This building houses the creative cubicles: (partly) enclosed spaces and can also be used as a big open space for experimenting purposes.
- To provide for enough daylight coming in, the roof needs rooflights above the walkways and the façade towards the park will be made out of glass. This glass curtain walls also creates a connection towards the park.

- The façade is situated on the West, meaning sunlight and heat of the sun during the day and late afternoon. To prevent the building from overheating, moving vertical shutters are placed.



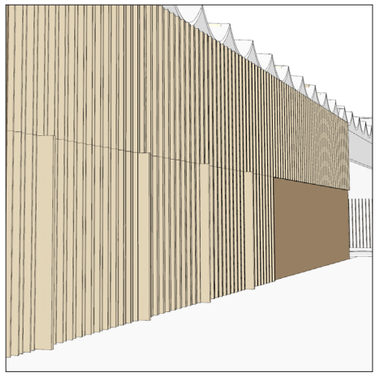




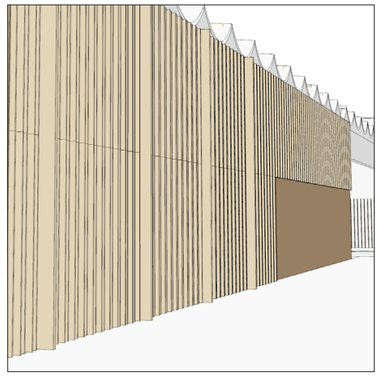


ARCHITECTURE

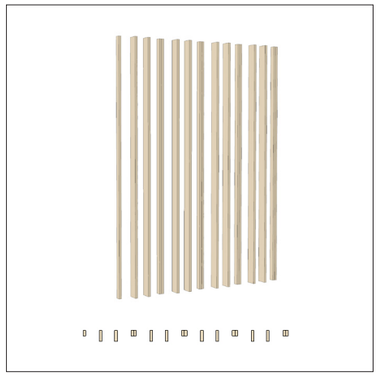
FAÇADE - SMART TIMBER WRAP: SYSTEMS AND VARIATIONS



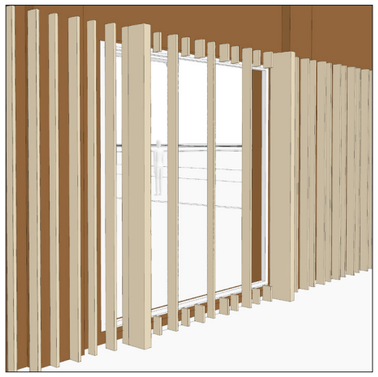
1. Marking the doors, one level



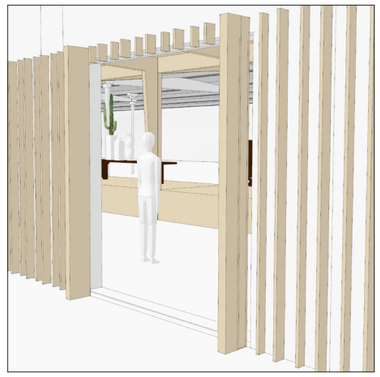
2. Marking the doors, two levels



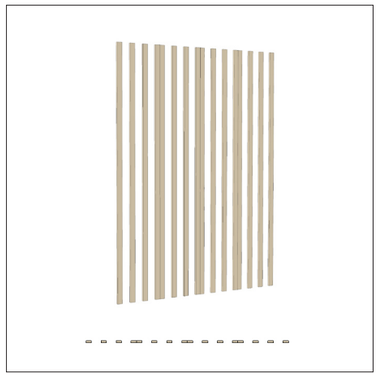
5. Façade variation 1



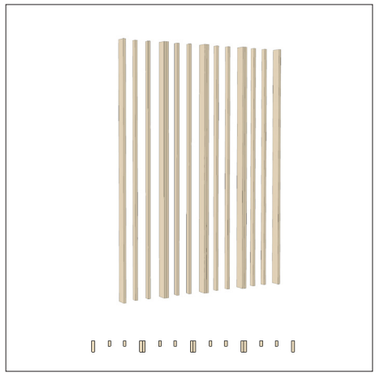
3. Marking the windows



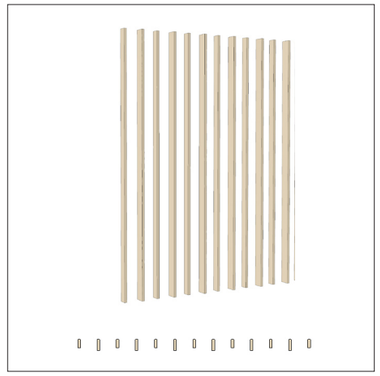
4. Marking the openings



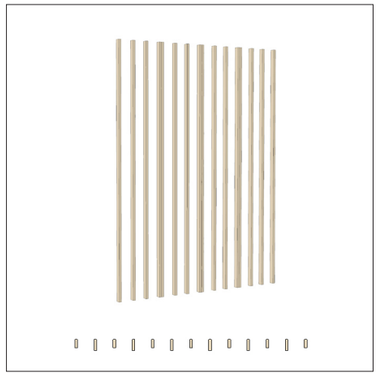
6. Façade variation 2



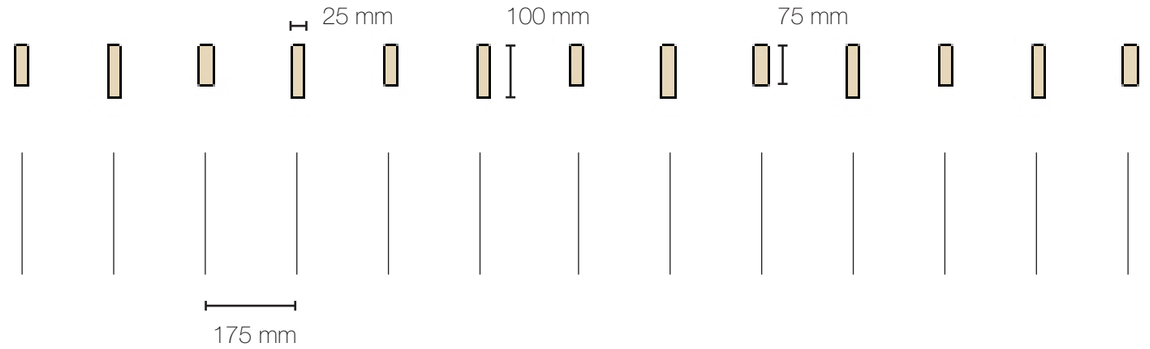
7. Façade variation 3

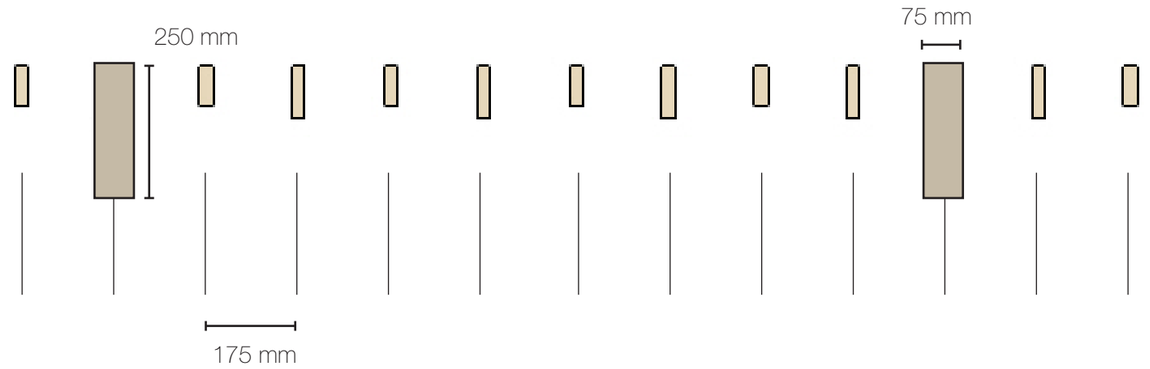


8. Façade variation 4



9. Façade variation 5





STANDARD SIZES??

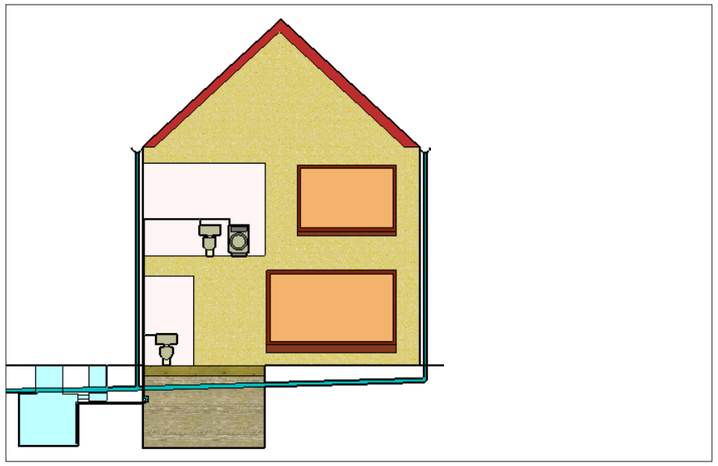
SUSTAINABILITY

WATER SYSTEMS

The idea is to combine two different ways of dealing with water: 1. To collect rainwater, to store it in an underground tank, to pump it towards the grey water system. 2. Grey water is not transported to the sewers but towards the creek, where it is filtered by helophytes. Because of the public functions of the buildings the amount of water needed for the grey water system is less than housing for example, where in this case it could be more beneficial to use a sustainable system like this.

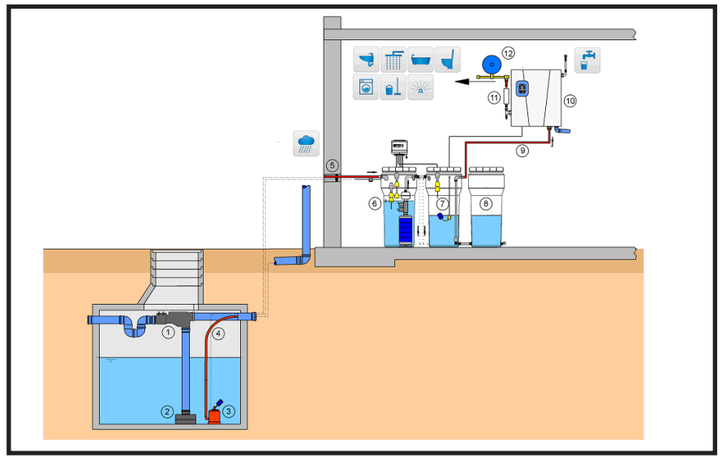
What happens when there is no rain?
What happens when there is

UTILIZING RAIN WATER FOR TOILETS



From the gutters, pipes transport the water towards a big tank under the ground. From there the water is pumped towards toilets as flushing water.

UTILIZING RAIN WATER FOR GREY WATER SYSTEM

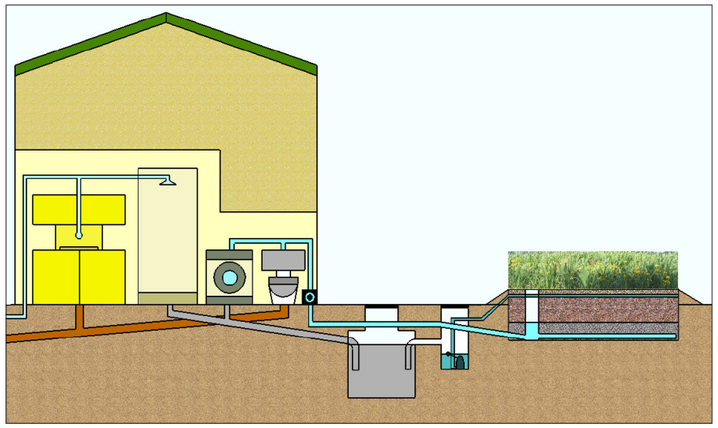


From the gutters, pipes transport the water towards a big tank under the ground. From there the water first is filtered where it then reaches the standards of the EC Directive 'Water intended for human consumption'. This filtering is done by an extra membrane filter and UV-exposure. This way of utilizing rain water is even more sustainable then only to use it for the toilets.

It can be used for:

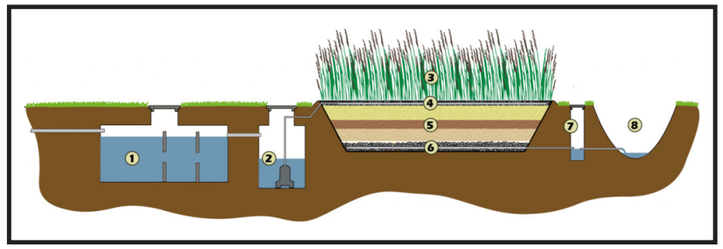
- Flushing of toilets
- Washing machines
- Outdoors use and cleaning
- Personal hygiene: washing and showering

FILTERING GREY WATER



It is also possible to filter water from the grey water system with helophytes and reuse this water again for washing machines and flushing toilets.

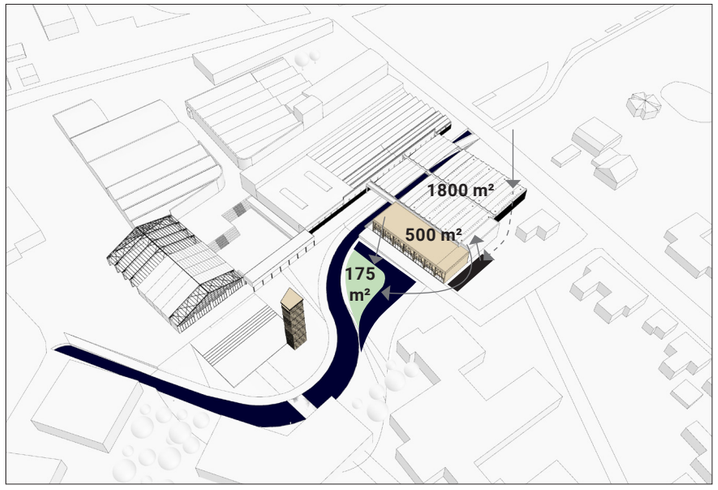
FILTERING GREY WATER



The most simple version of using helophytes is to filter grey water and let it flow back to surface water.

With this vertical helophyte filter system, the most severe toxicated water can be filtered and is a wise way of filtering water for the function of workshop.

INTEGRATION OF SYSTEMS INTO THE AREA



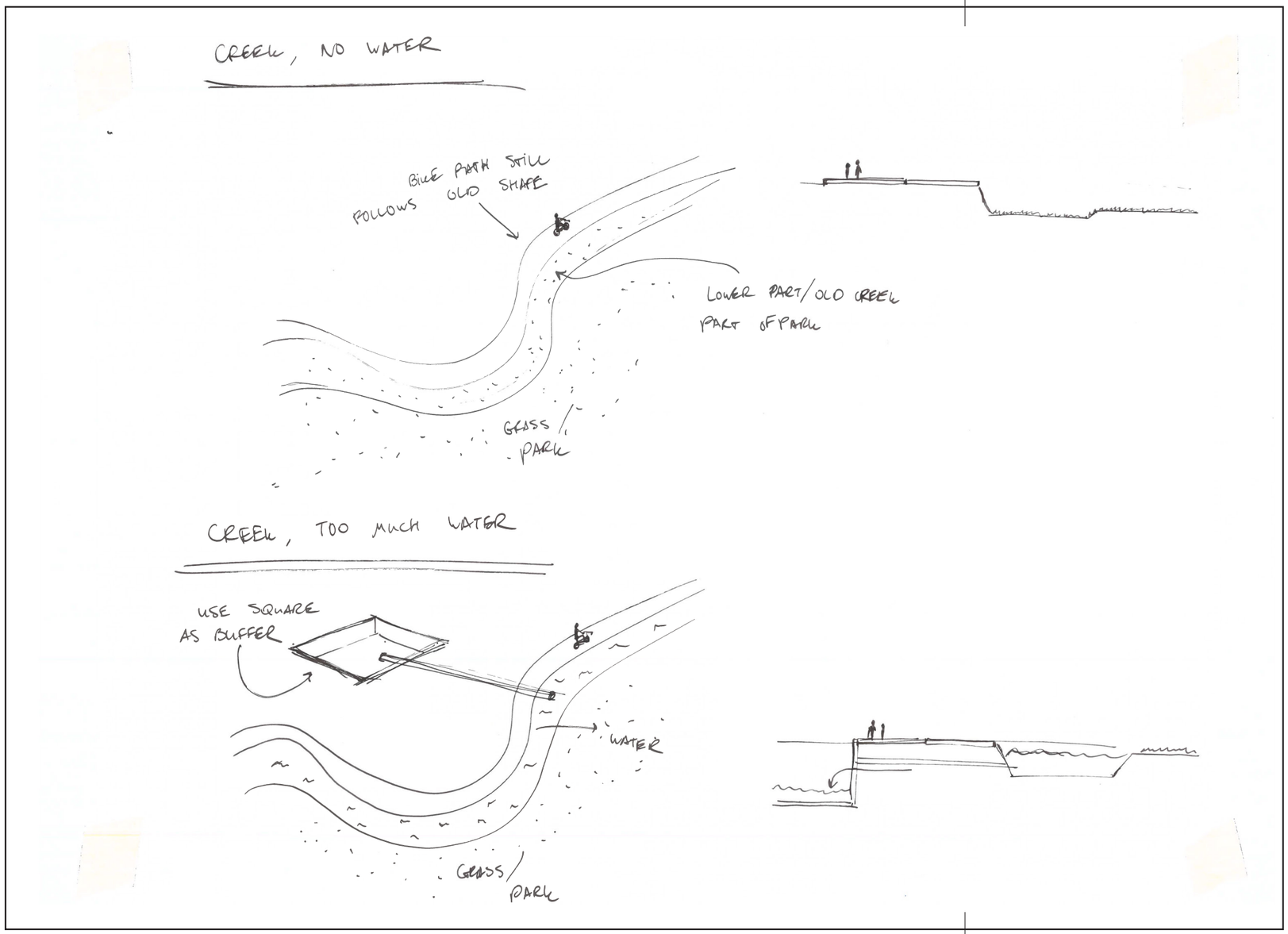
- Rainfall is 790 liter / m^2 / year.
790*2300 = 1.817.000 liter water on roof per year.

Public building: 200 liter per day per person. 150 liter as grey water and 50 liter as fresh water.
1.817.000/365/150 = 33 people

Helophytes: 5 m^2 per person. 5*33= 165 m^2

SUSTAINABILITY

WATER SYSTEMS



BUILDING TECHNOLOGY

CIRCULAR MATERIALS

BioFoamPearls is a biodegradable expanded insulation material with properties comparable to those of of EPS (Styrofoam). This organic EPS is suitable for insulation in new construction and renovation. The material is gathered from organic waste collections. After composting and some photosynthesis, a fermentation process is used which turns the result into lactide molecules. These are polymerised and form so-called biobeads. By then foaming the result, biofoam pearls are created.

A patented solution allows this foam to be heated and expanded to produce a substance that is 100% biodegradable. An important aspect in this respect is the reduced quantity of fossil fuel required to produce the material, compared to other insulation materials. Carbon dioxide emission levels are also 40% lower compared to average emission levels for all other petroleum-based plastics.

The 'Grey' BioFoamPearls® is an improvement on the 'Green' BioFoamPearls. It is now possible to achieve the highest possible insulation levels by using specially designed graphite beads with a thermal conductivity of 0,036 W/mK.

Applications include cavity wall insulation, roof insulation and floor insulation. The material is available in a dark grey colour with a density of around 18,6 kg/m3.

Best-in-Class akoestieke isolatiematten gemaakt van ge-upcyclede cellulose vezels. .

Everuse® Isolatiesysteem is een combinatie van de C2C EverUse® isolatieplaat met een C2C gipsplaat.

Dankzij het slimme montage systeem kunt u razendsnel werken. Daarnaast zorgt dit product voor contactloze isolatie, wat de akoestische eigenschappen verhoogt.

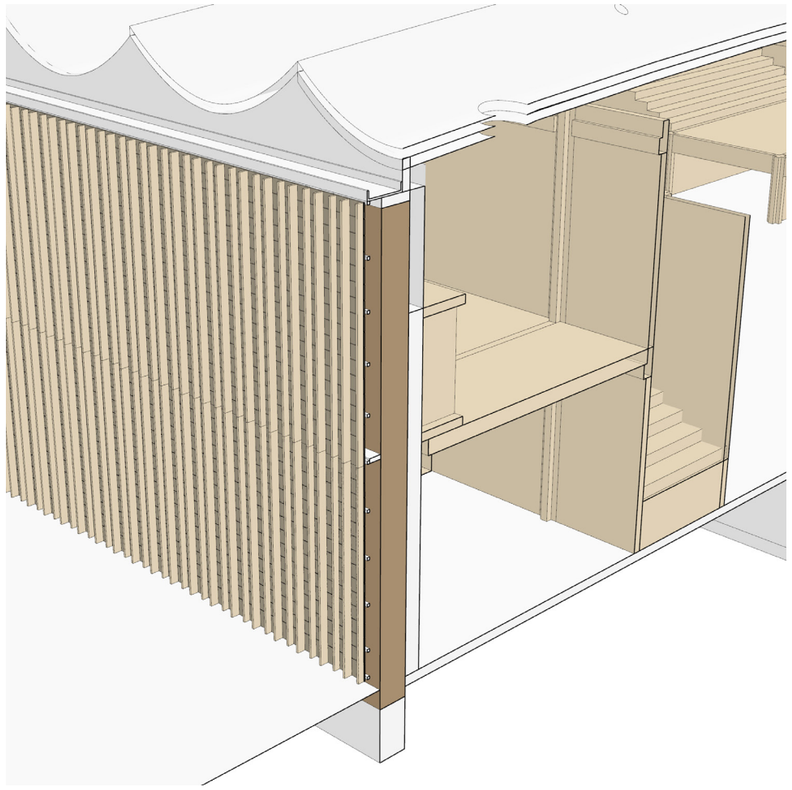
Dit product wordt veel gebruikt voor het isoleren van daken en wanden.

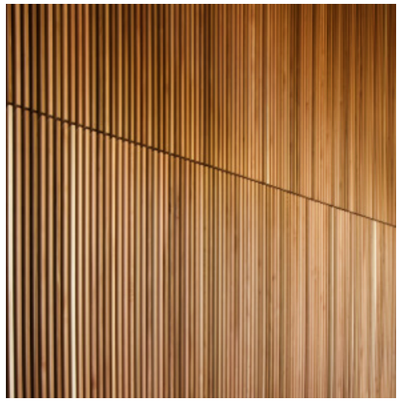
This material is produced from residual material from sawmills, and therefore does not come from intentional logging. The production process for the insulation is also extremely environmentally friendly: all waste is processed and reused as a renewable energy source. All PAVATEX products have an EPD product declaration.
Pavatherm+ is een waterkerende plaat die gebruikt wordt als isolatieplaat voor massiefbouw of skeletbouw die wel eens nat kan worden. Ze meet 1780*560mm en heeft ook weer 4-zijdig een sterke tand en groef. De buitenste 20mm zijn gelatexeerd/geparaffineerd en dus waterdicht. Tegelijkertijd blijft de plaat zoals alle Pavatex platen volledig vochtregulerend en dampopen.

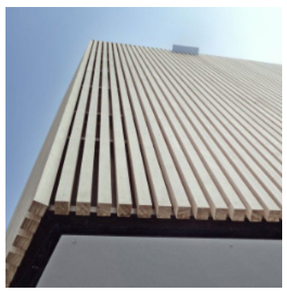
als dikke onderdakplaat
als sarkingdakisolatie (eventueel gecombineerd met Combi)
als gevelisolatieplaat op massiefbouw (hout/steen)
als dikke mantel rond een houtskelet voor afwerking met beplanking, gevelsteen, muurtuin, gevelpannen, enz.

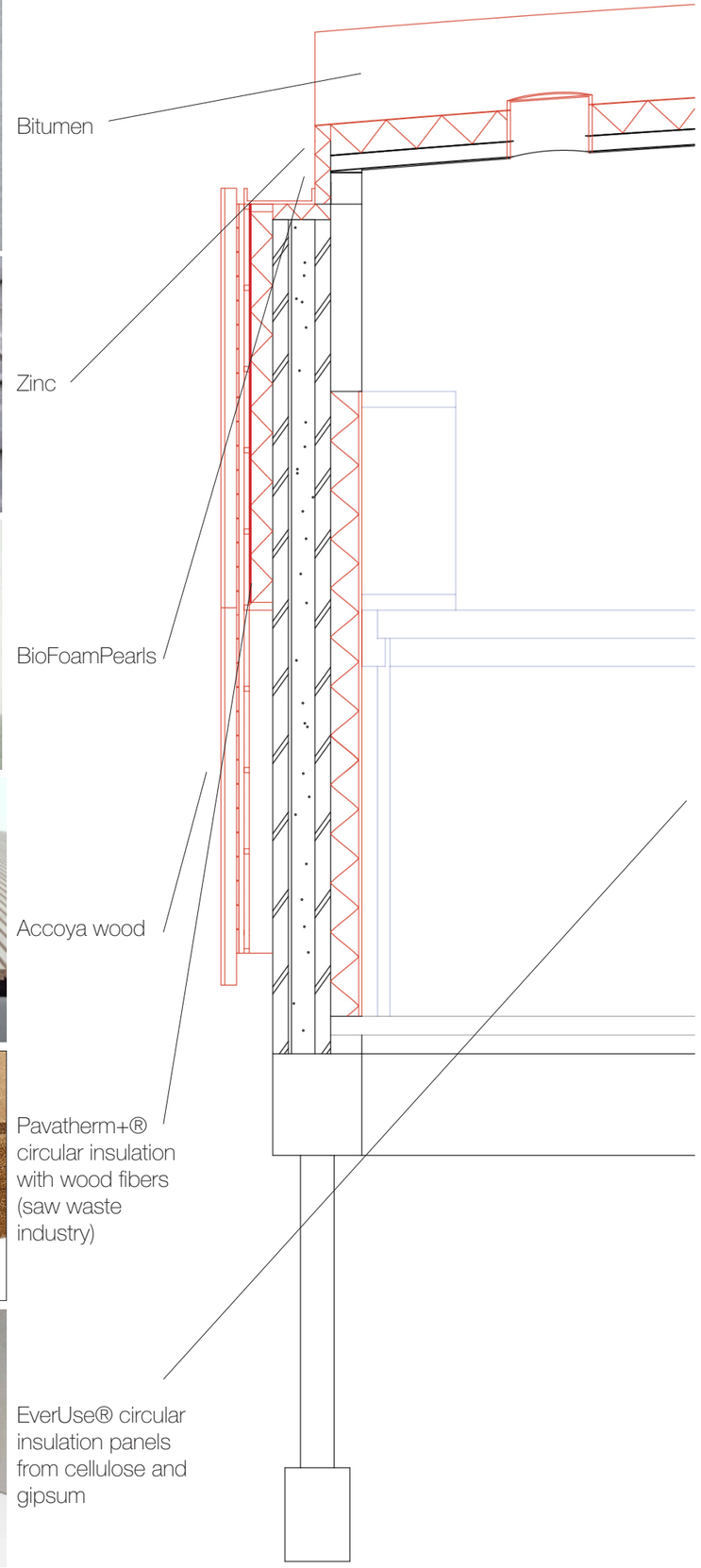
BUILDING TECHNOLOGY

DETAIL A: 1:20 / 1:5



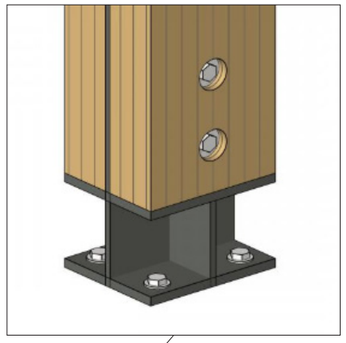


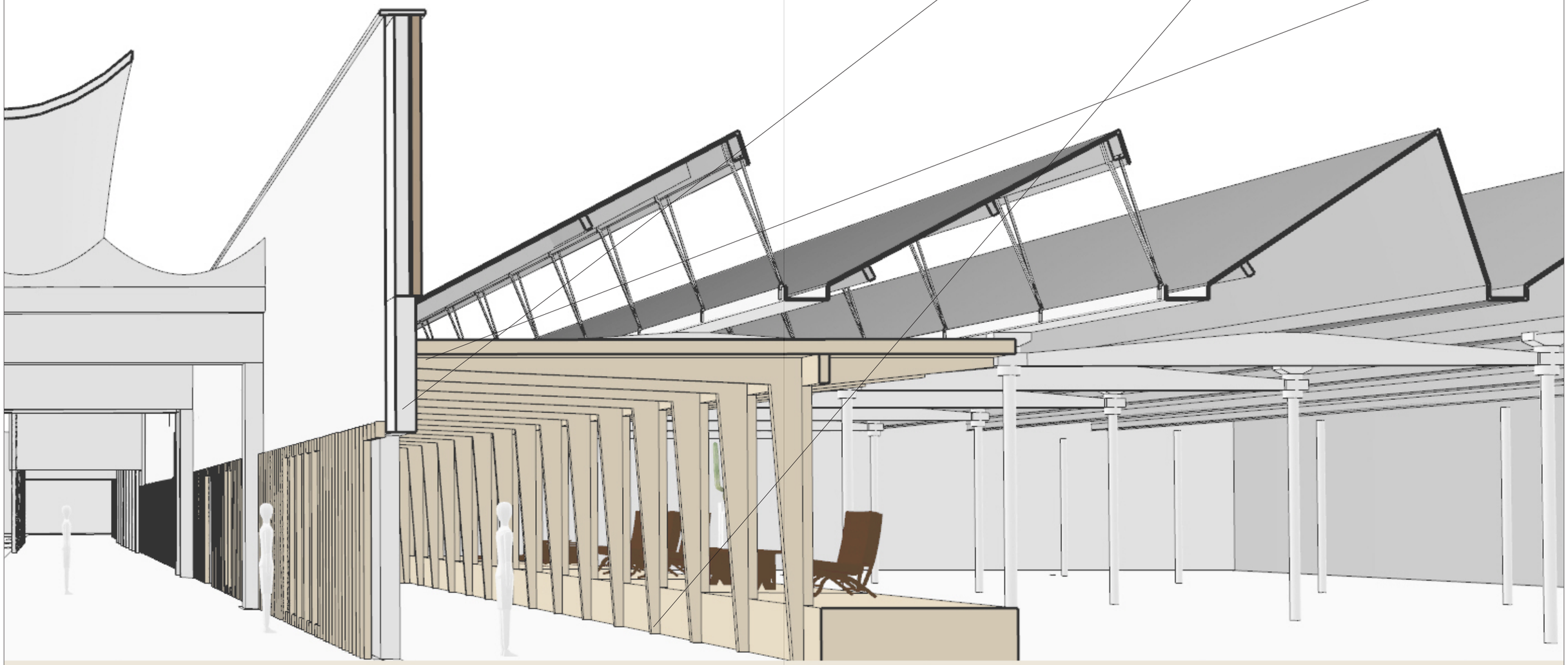




BUILDING TECHNOLOGY

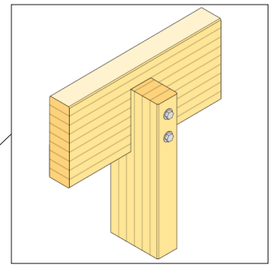
DETAIL B: 1:50

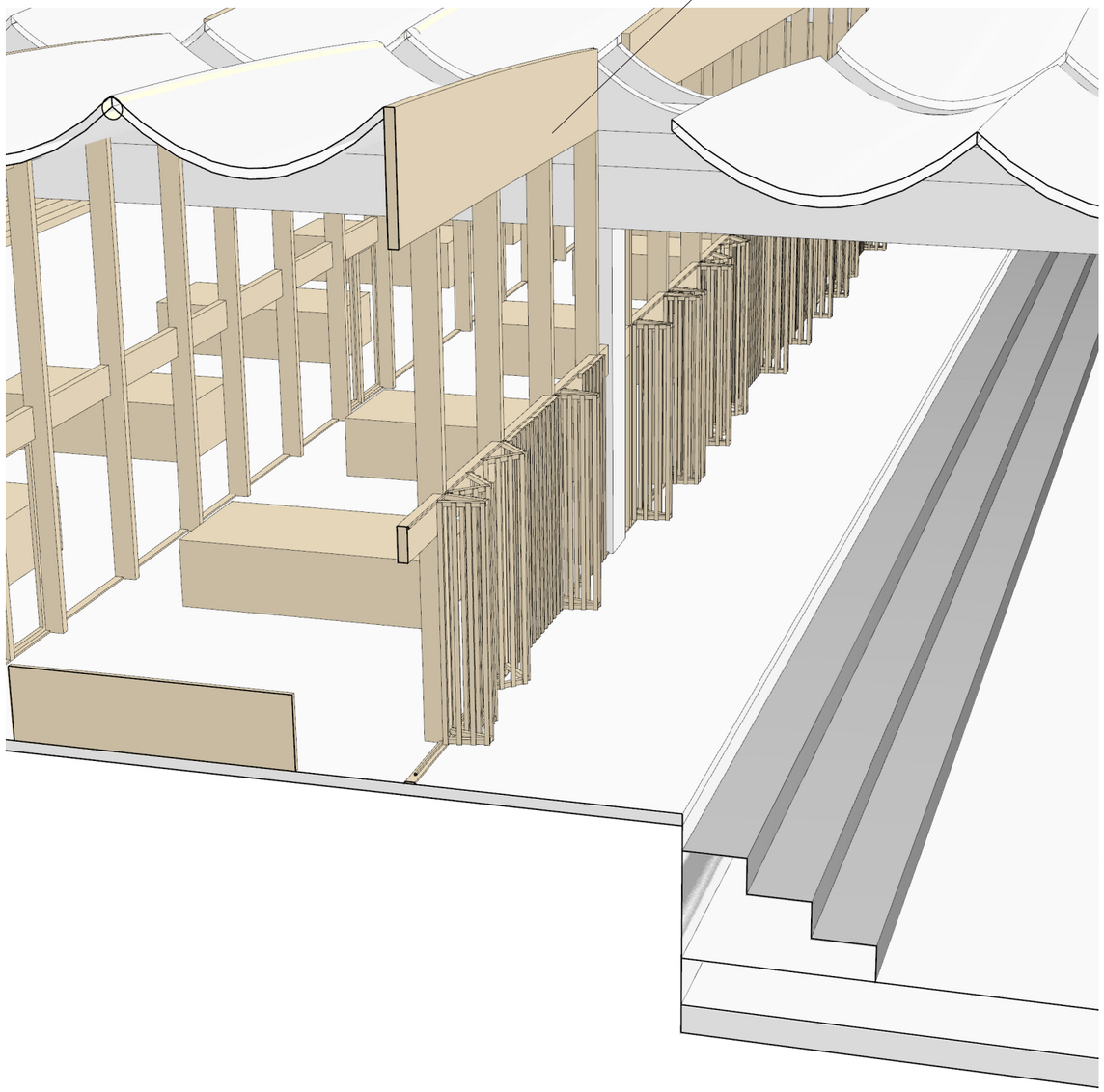




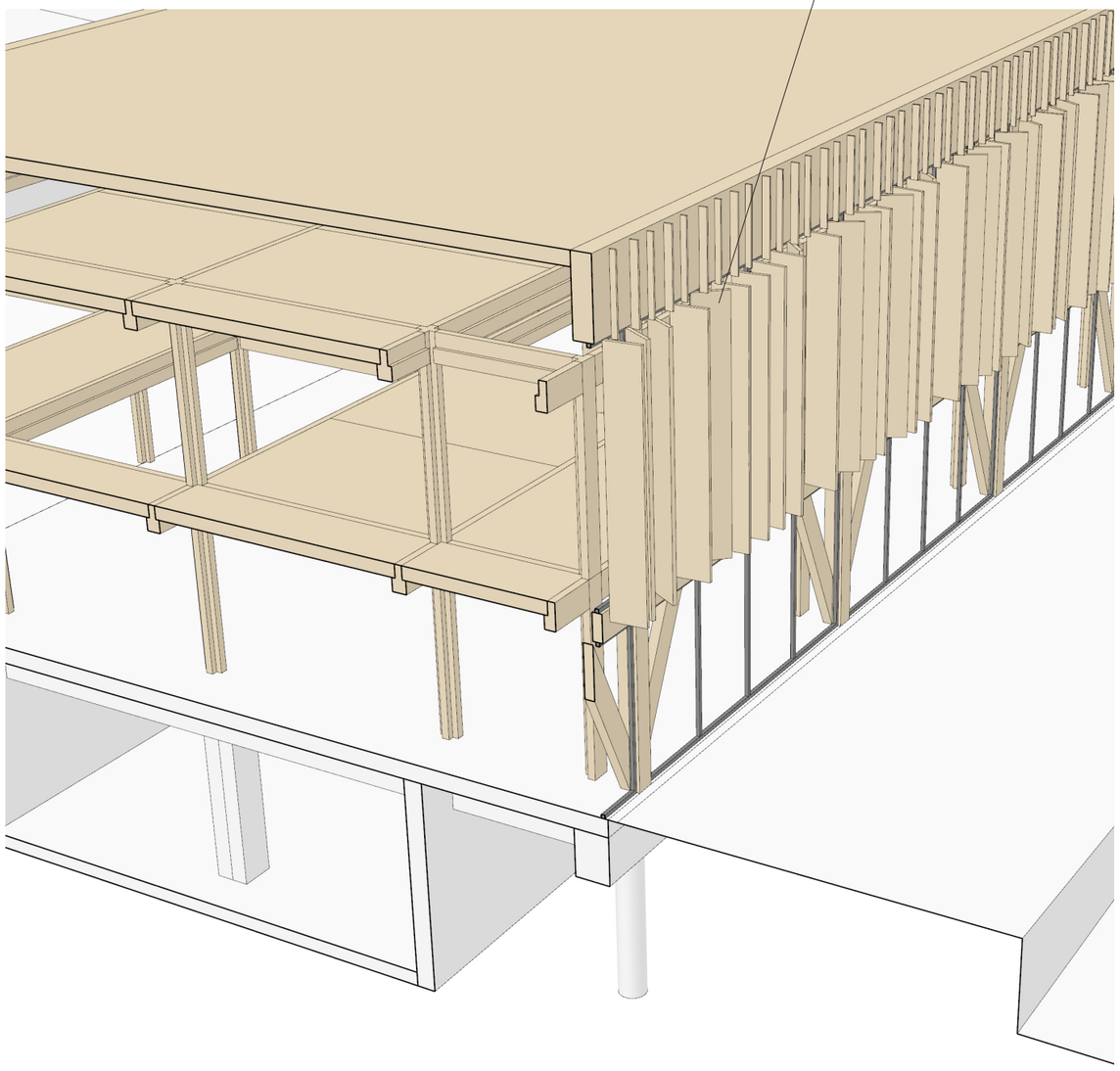
BUILDING TECHNOLOGY

DETAIL C: 1:20 / 1:5





DETAIL D: 1:20 / 1:5

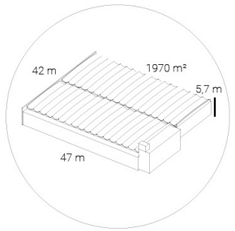


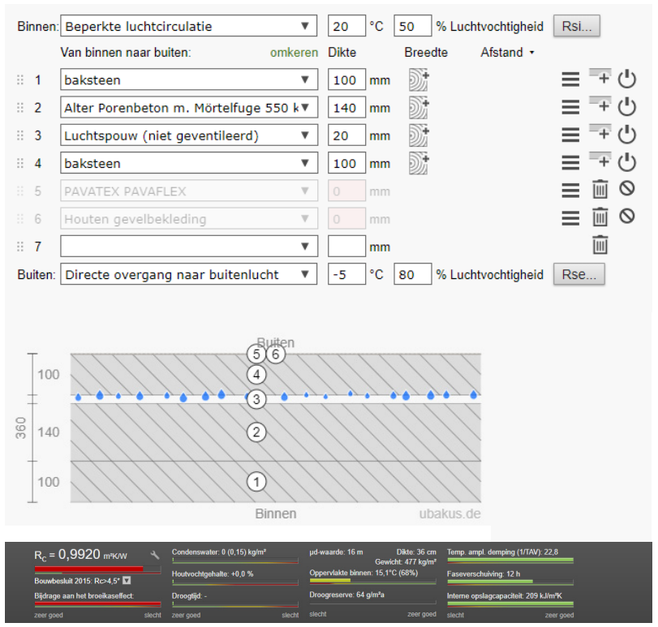
TIMBER TOWN

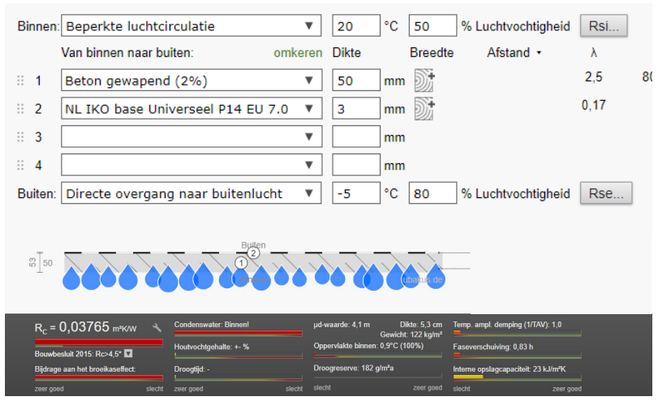
23-04-2020

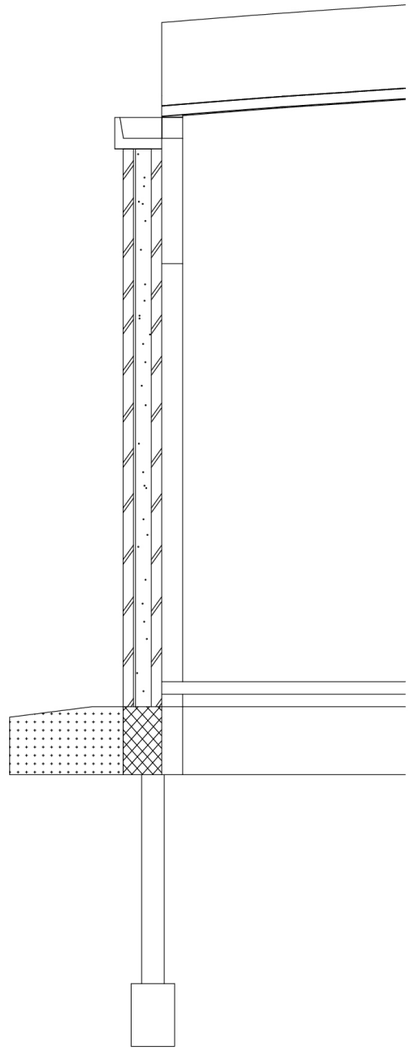
BUILDING TECHNOLOGY - DETAILS

CURRENT SITUATION: FAÇADE





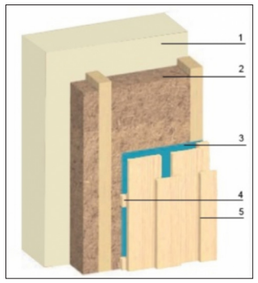




Façade:
Current Rc: 1 m²K/W
Goal Rc: 4,5 m²K/W

Roof:
Current Rc: 0,04 m²K/W
Goal Rc: 6 m²K/W

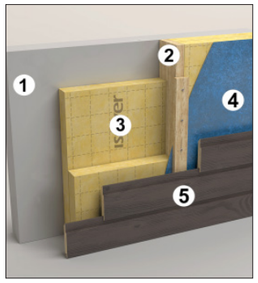
STRUCTURE BUILT-UP AND INSULATION OPTIONS (OUTSIDE)



1. Loadbearing wall
2. Insulation (here wood fibres)
3. Water repellent layer
4. Timber frame (min. 4 cm for timber cladding) with open seams for ventilation
5. Timber cladding

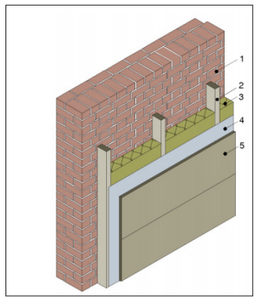
Structure supports insulation and finishing. This cladding usually consists of a certain cladding (timber, aluminium, fibres panels) but can also be stuco.
Used isulation: half stiff or bulk. Examples: wood fibre insulation, cellulose, hemp blocks, cork)

1. Loadbearing wall and insulation
2. Water repellent layer
3. Façade support
4. Timber frame
5. Timber cladding



1. Loadbearing wall
2. Timber frame
3. Insulation
4. Water repellent layer
5. Timber cladding

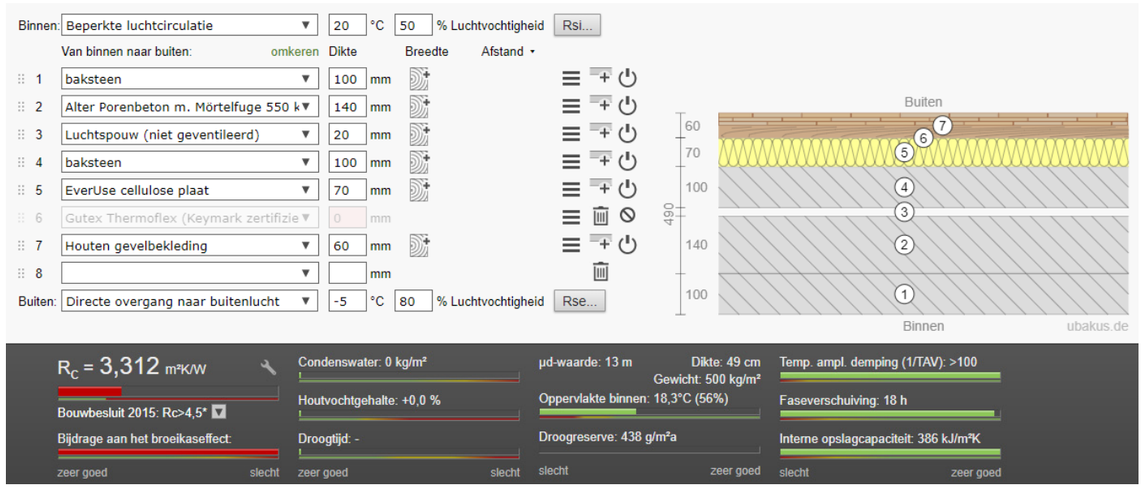
STRUCTURE BUILT-UP AND INSULATION OPTION (INSIDE)



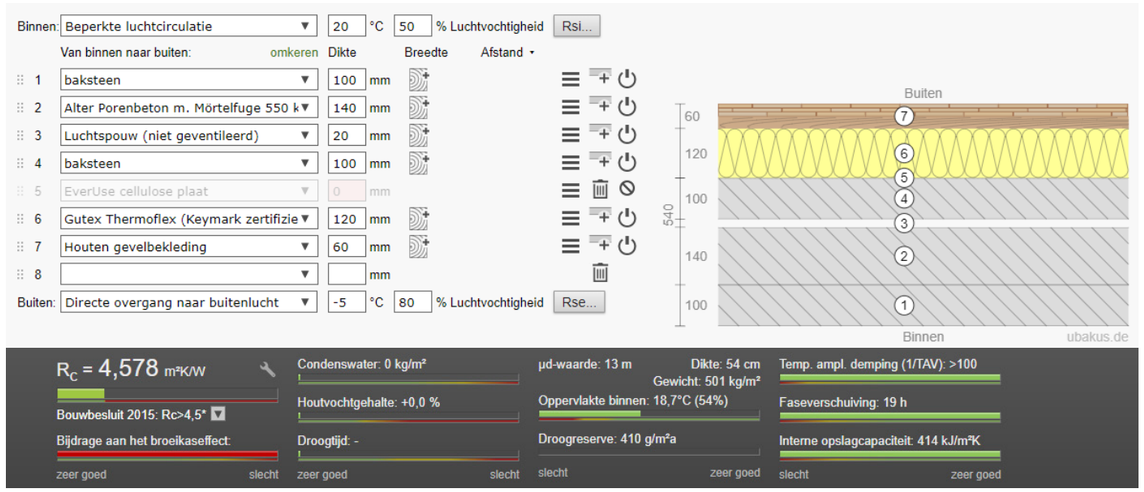
1. Loadbearing wall
2. Timber frame
3. Insulation
4. Optional damp layer
5. Finishing

BUILDING TECHNOLOGY - DETAILS

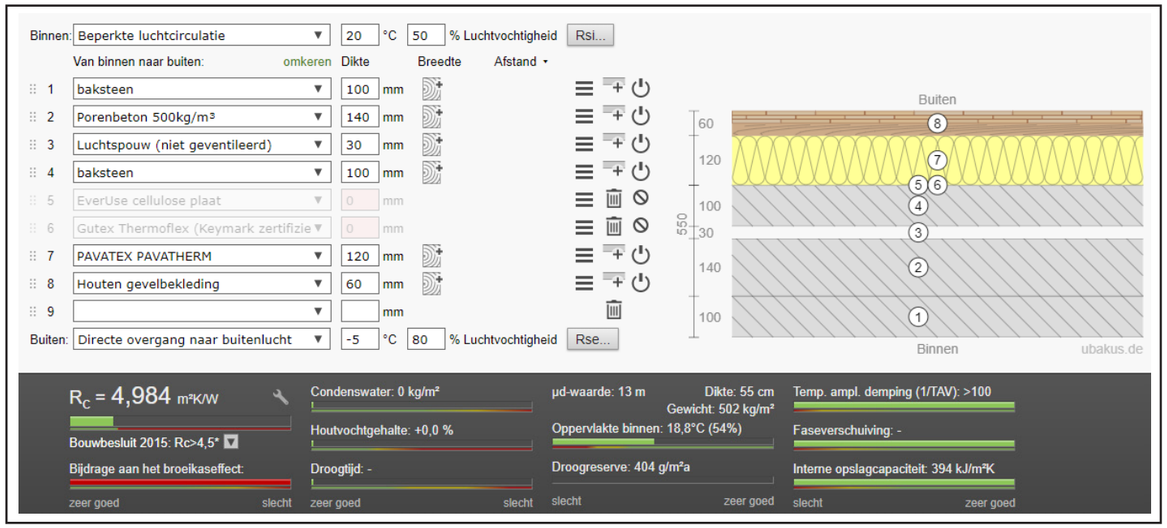
NEW SITUATION: FAÇADE OPTION 1



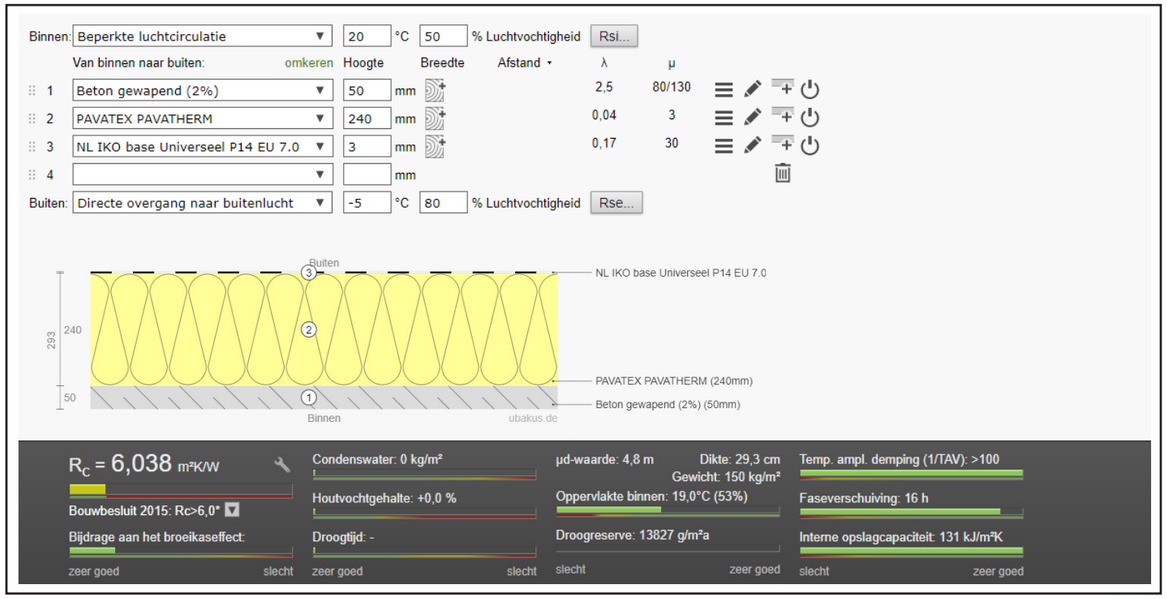
NEW SITUATION: FAÇADE OPTION 2



NEW SITUATION: FAÇADE OPTION 3

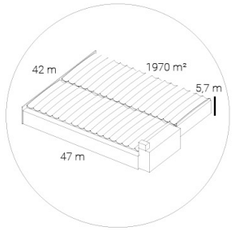


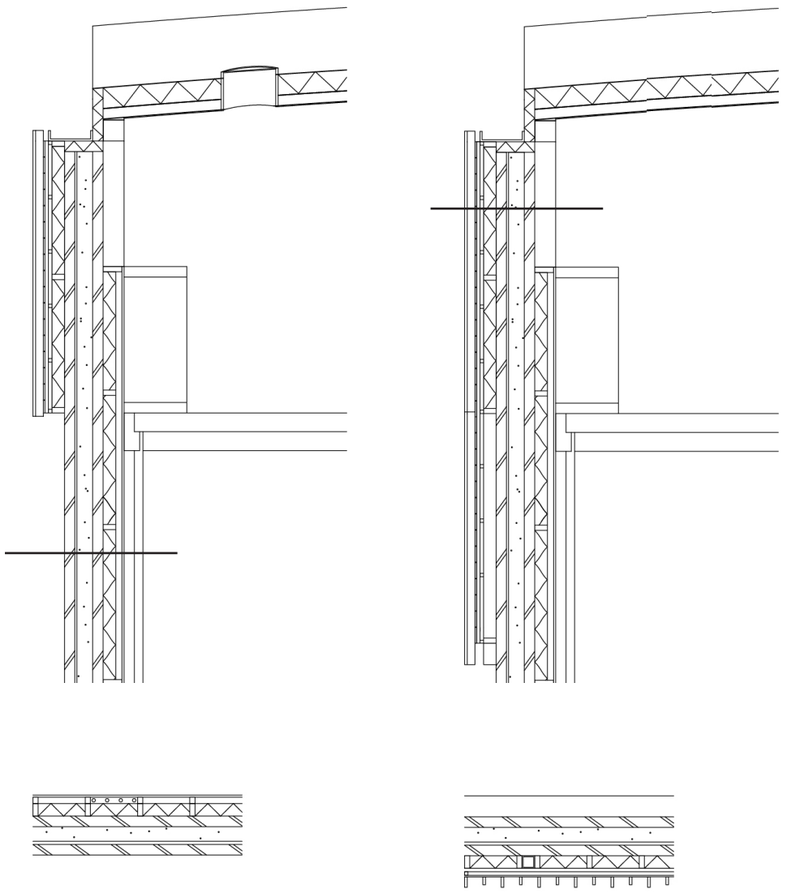
NEW SITUATION: ROOF

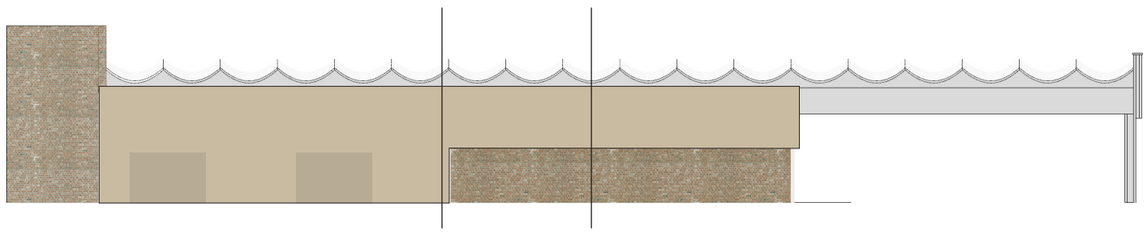


BUILDING TECHNOLOGY - DETAILS

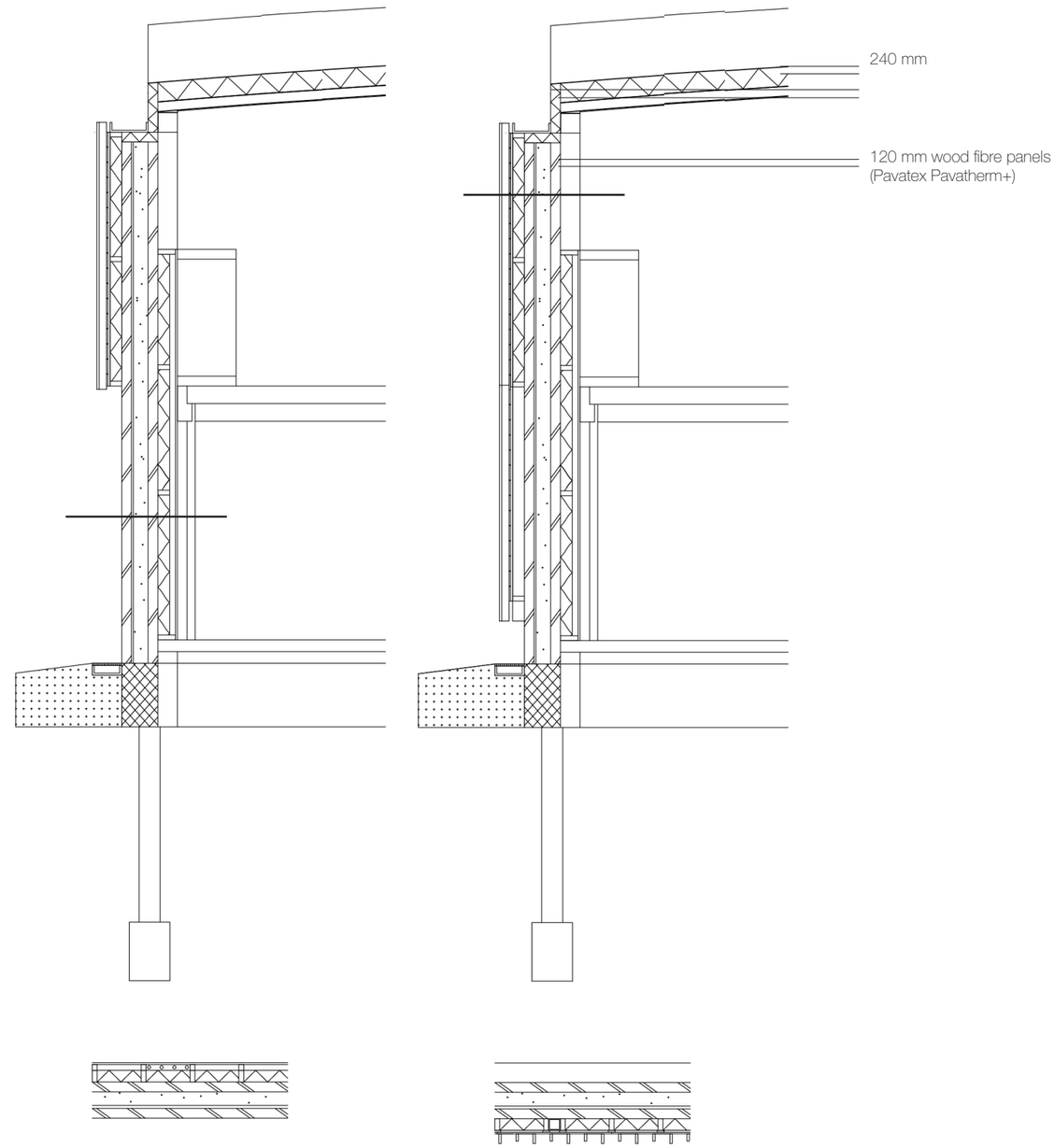
NEW SITUATION: FAÇADE AND ROOF OPTION 1





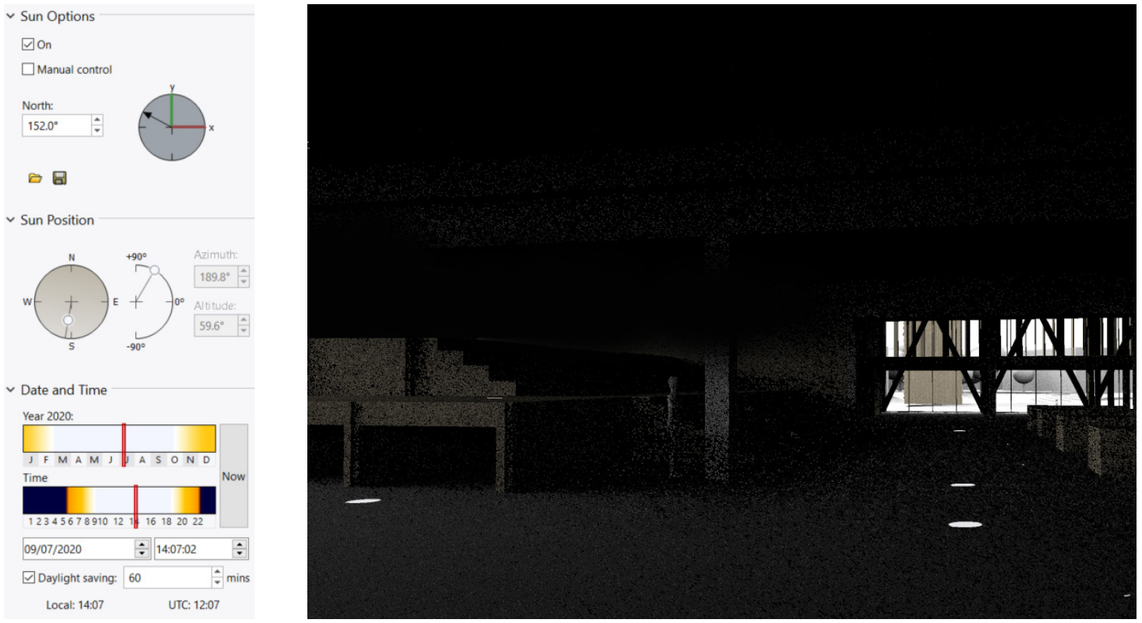


NEW SITUATION: FAÇADE AND ROOF OPTION 2

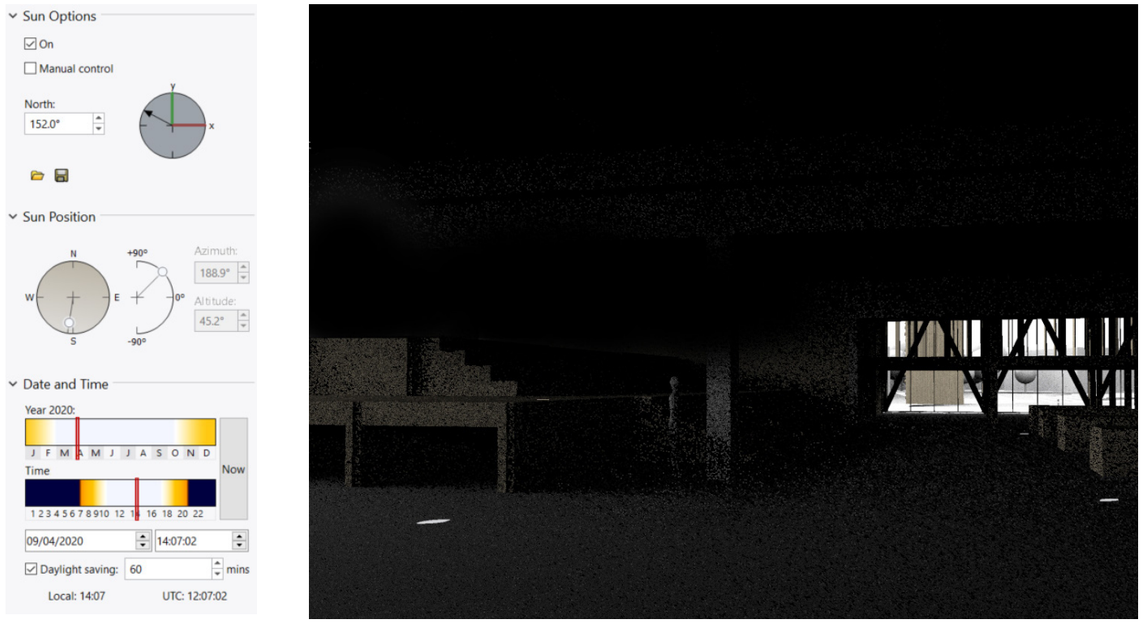


BUILDING TECHNOLOGY - SUNLIGHT

9 JULY, 14.00



9 APRIL 14.00



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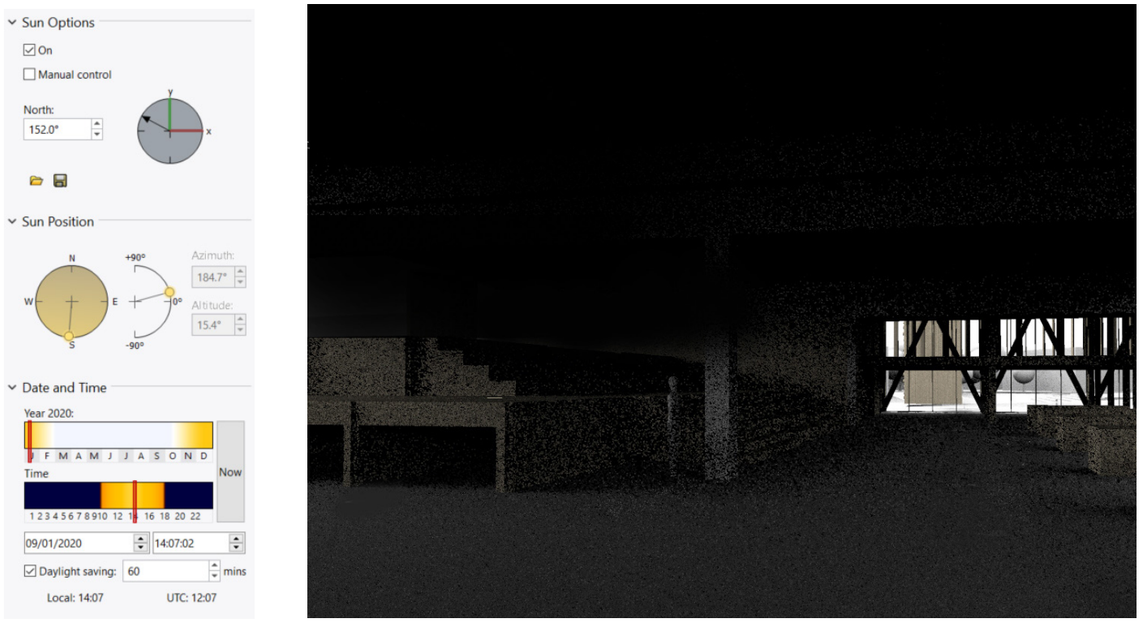
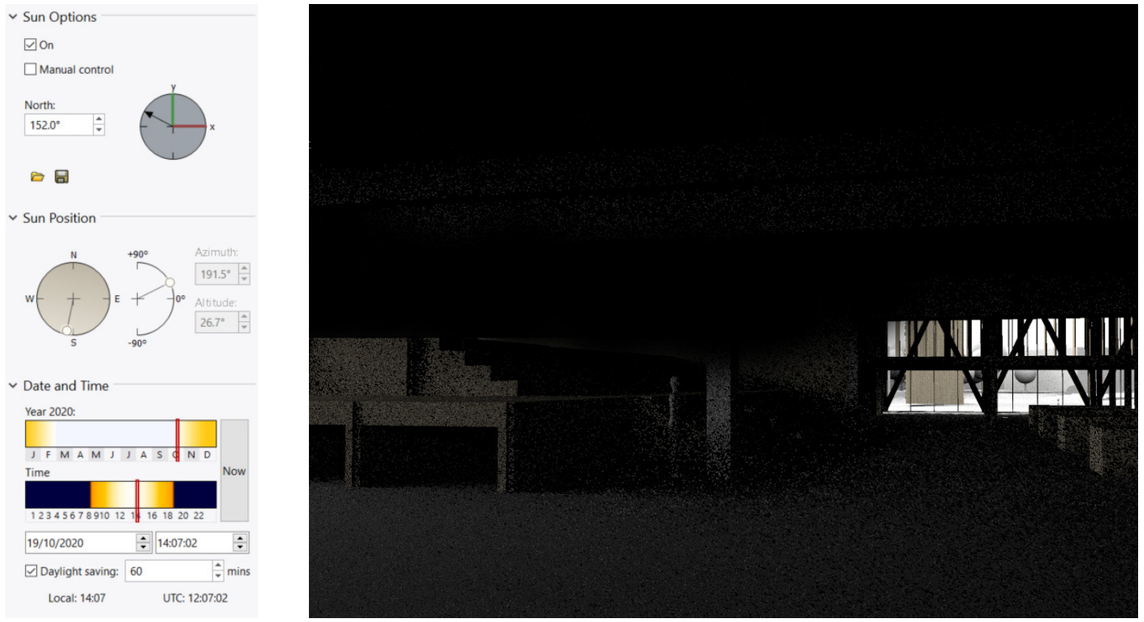
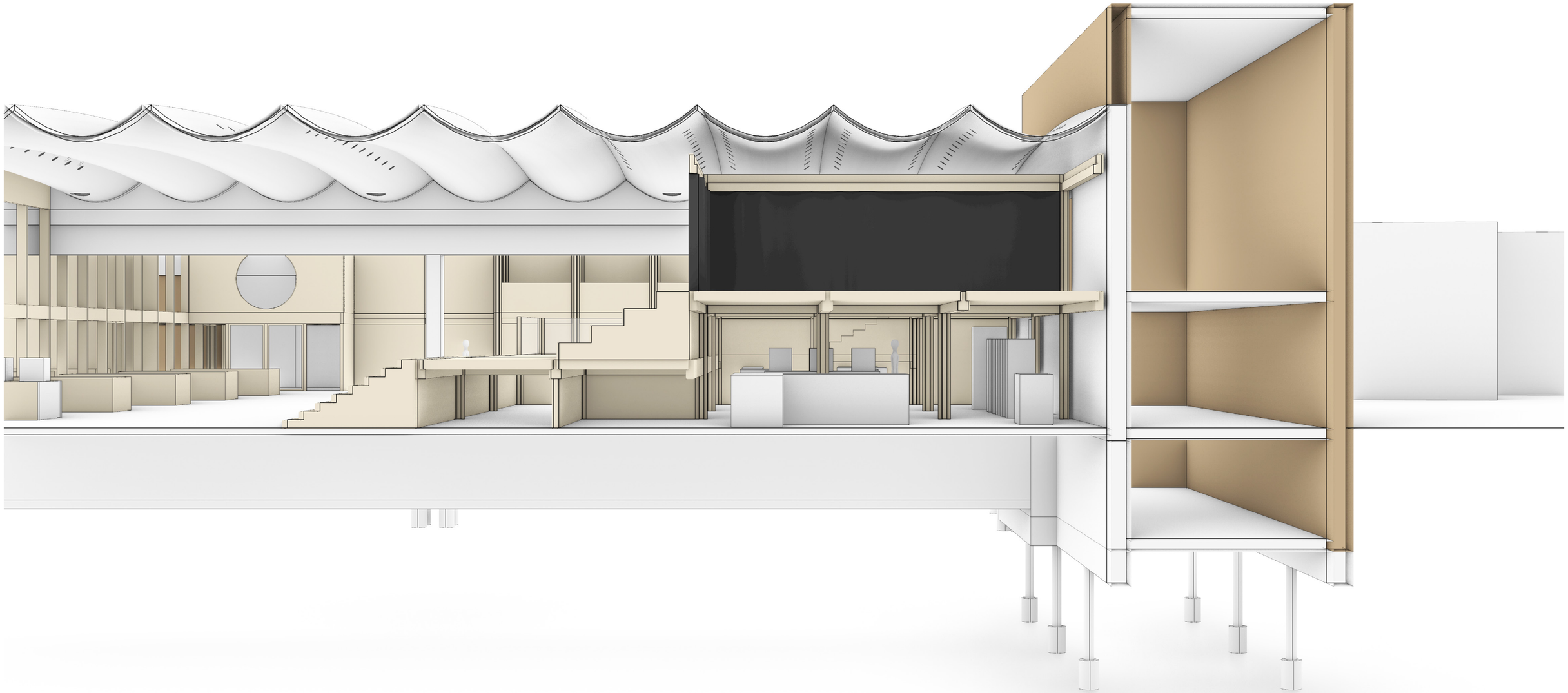


9 OCTOBER, 14.00

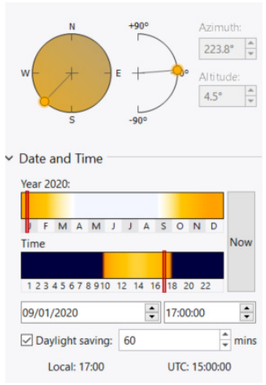


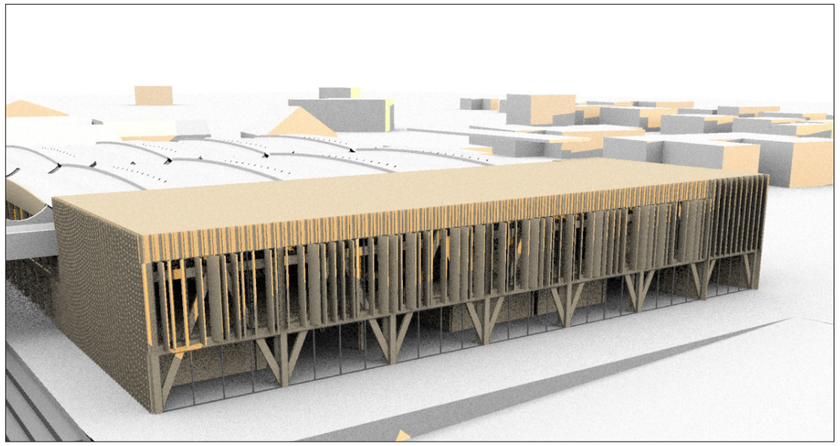
BUILDING TECHNOLOGY - SUNLIGHT



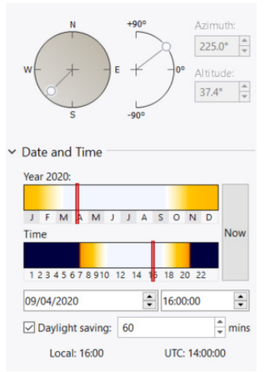
BUILDING TECHNOLOGY - SUNLIGHT

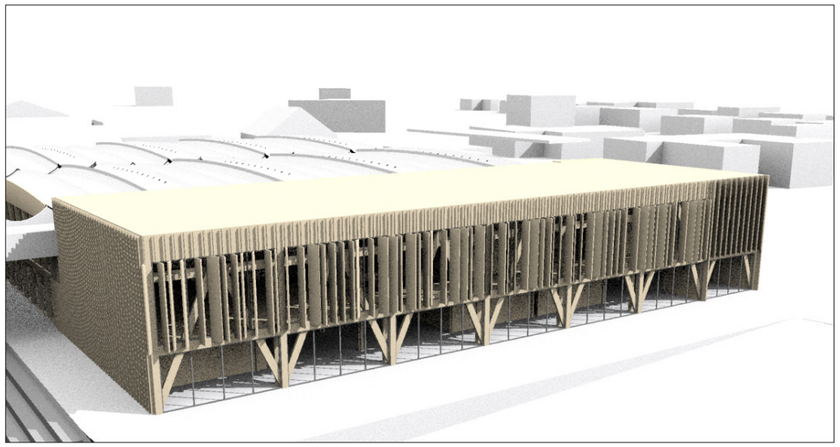
9 JANUARY 17.00



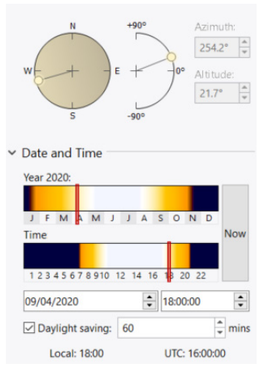


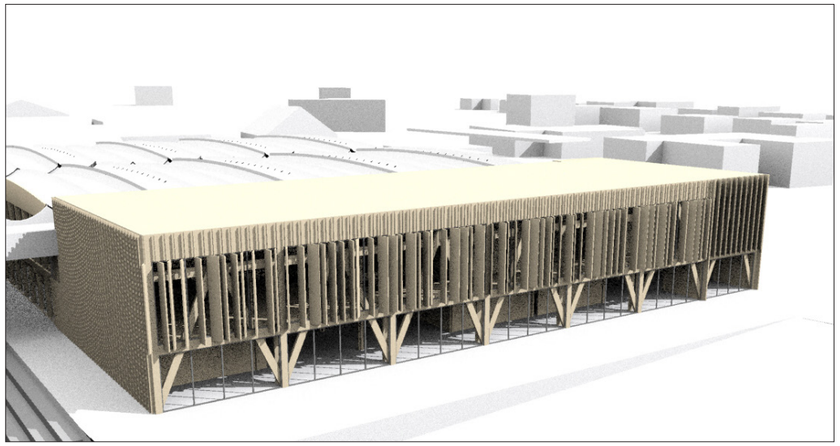
9 APRIL 16.00



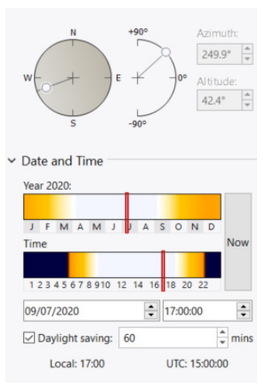


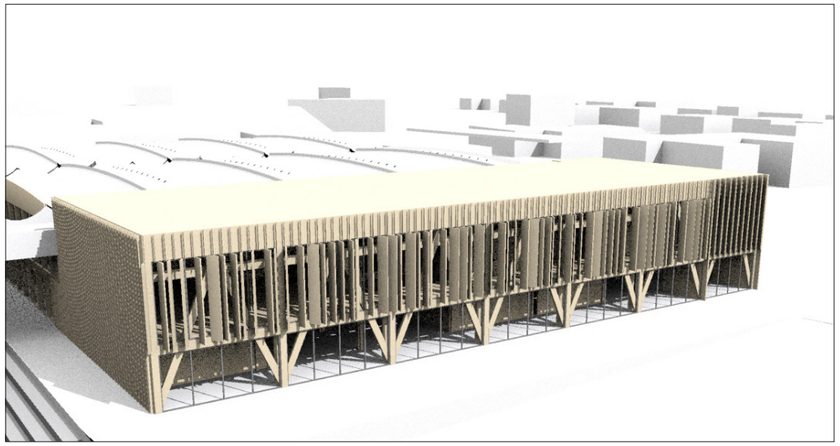
9 APRIL 18.00



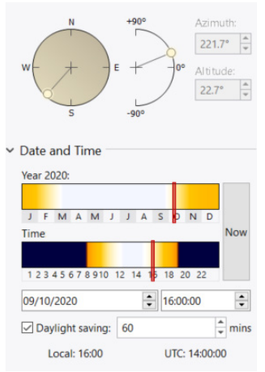


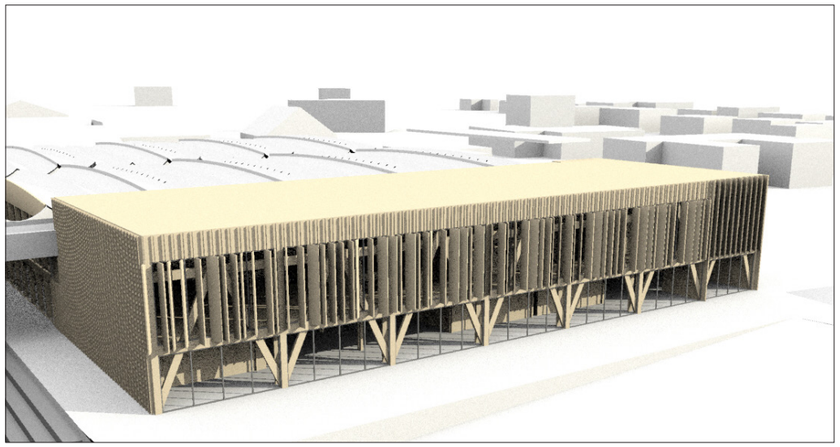
9 JULY 17.00





9 OCTOBER 16.00





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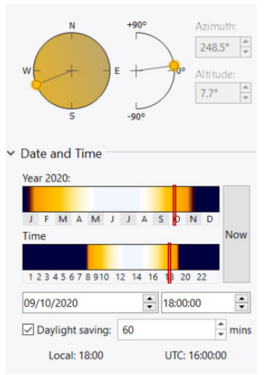
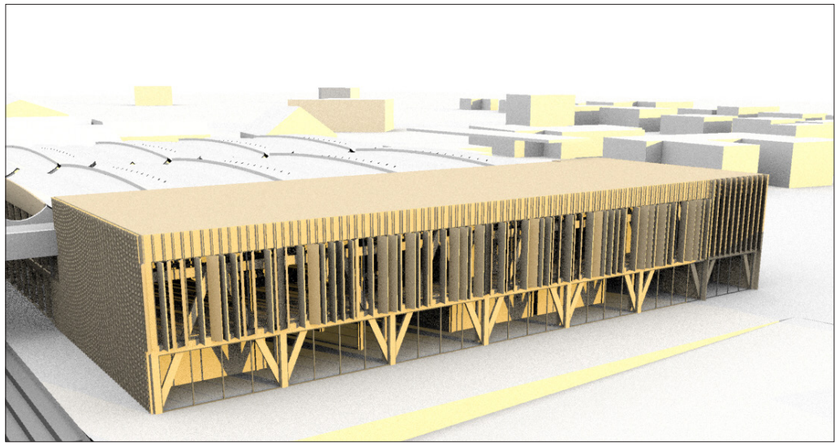
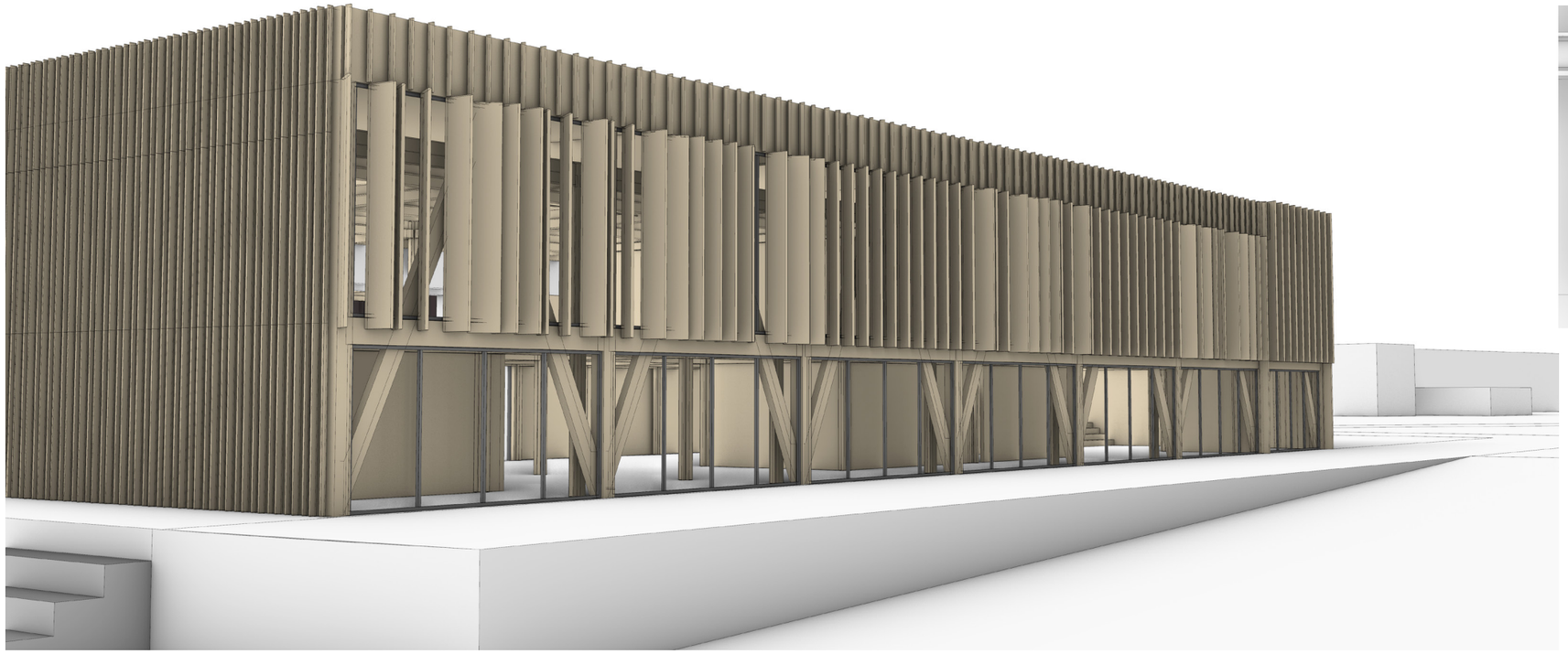
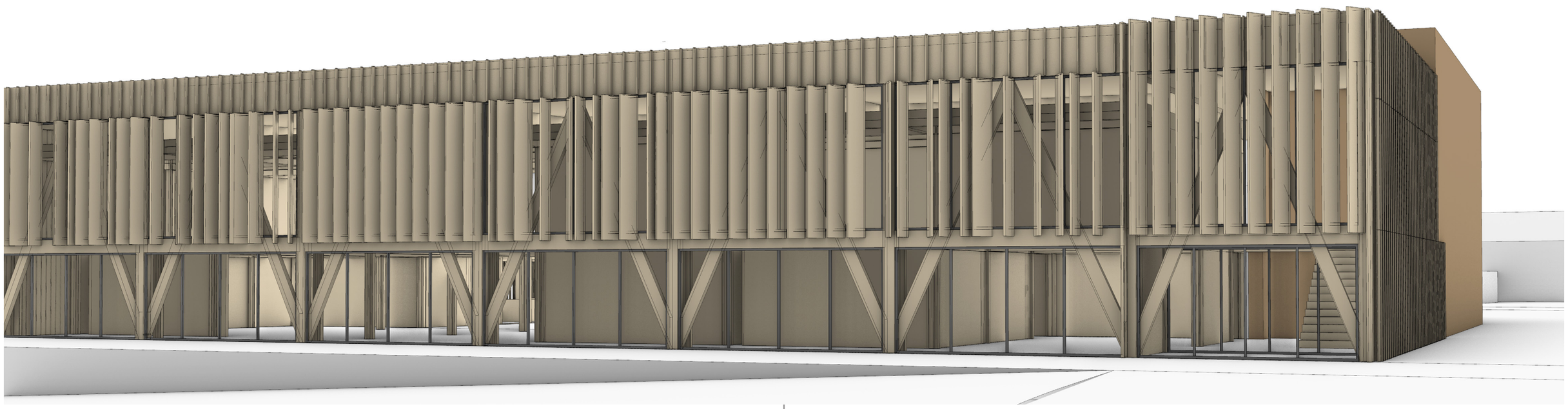


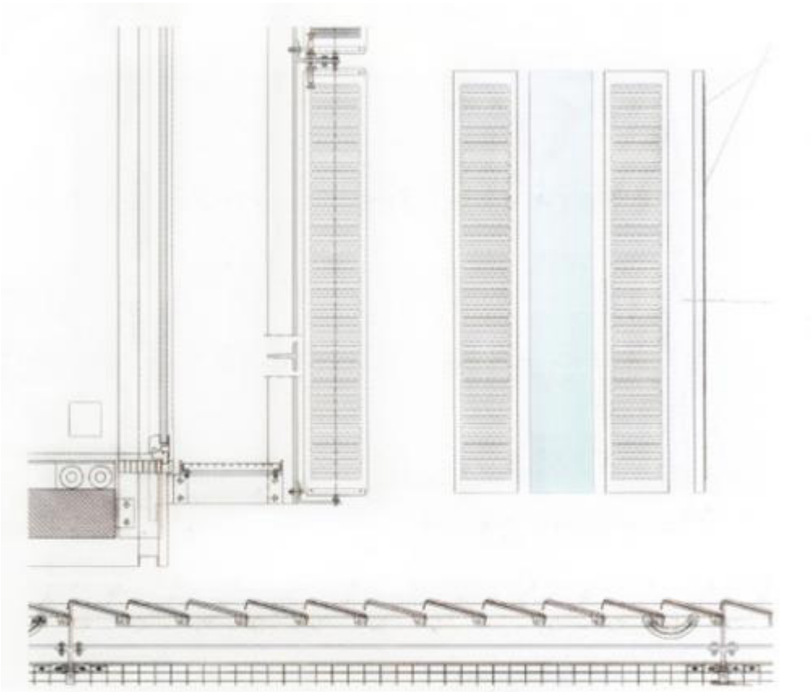


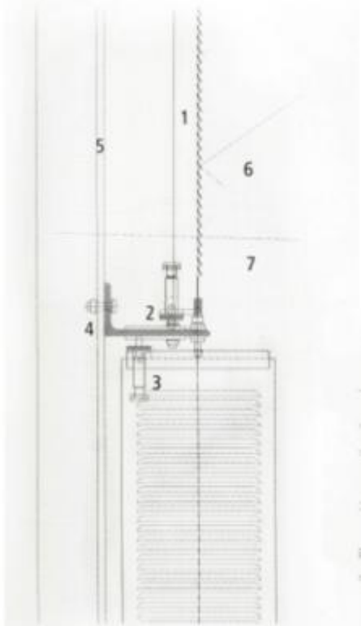
BUILDING TECHNOLOGY - SUNLIGHT



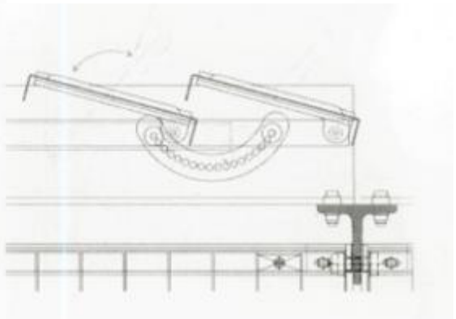


BUILDING TECHNOLOGY - SUNLIGHT

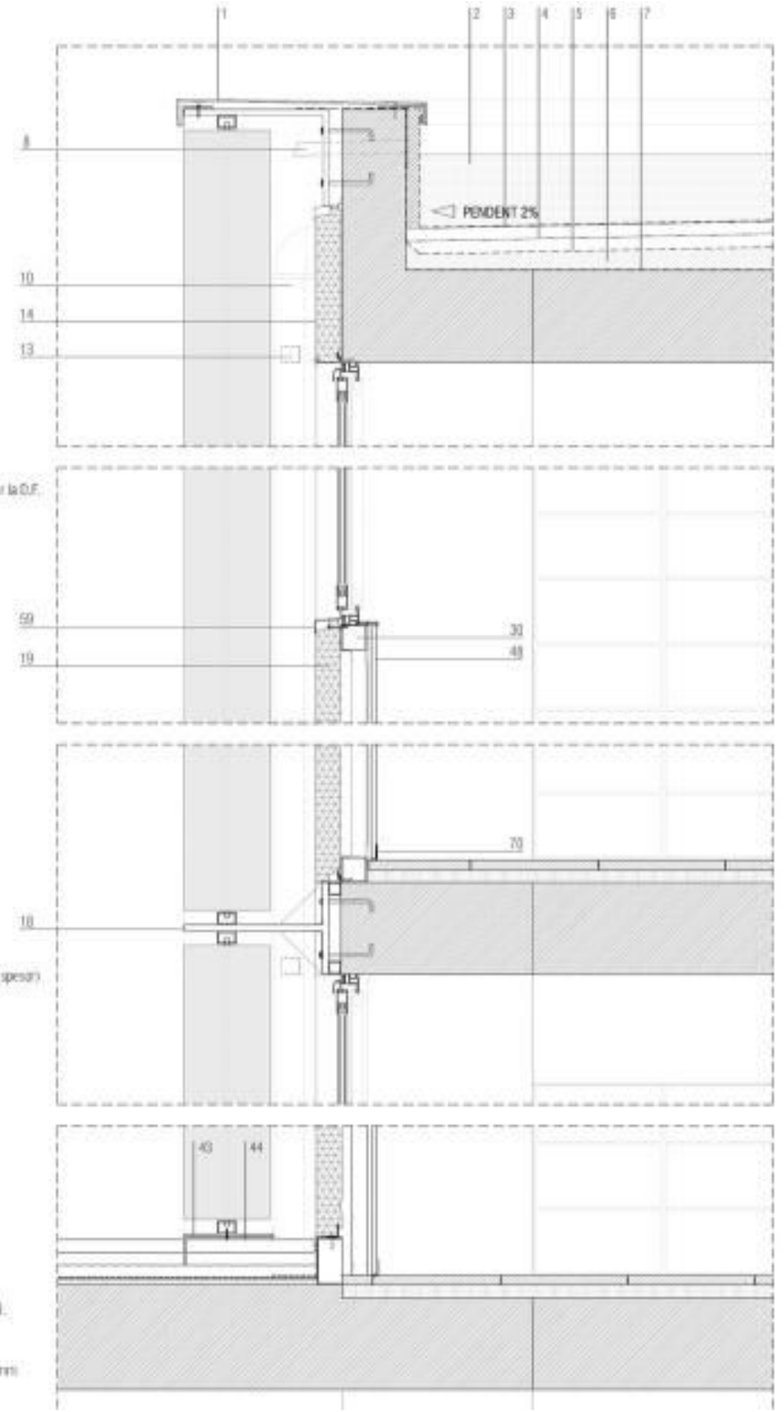




1. Galvanized steel louvers
2. Control rod of stainless steel
3. Lever for manual control
4. L profile of galvanized steel
5. T profile of galvanized steel
6. Parasol
7. Views



1 Goterón de chapa de zinc. Fijado mecánicamente a forjado
2 Acabado de cubierta en grava
3 Geotextil
4 Poliestireno expandido de 4cm de espesor
5 Lámina asfáltica impermeabilizante
6 Hormigón celular para formación de pendientes
7 Lámina barrera de vapor
8 Cárcola de hierro galvanizado formada por un tubo Ø 510mm e=10mm cortado
10 Sumidero prefabricado de la casa interior
13 Espacio reservado para motor de las láminas orientables mecanizadas
14 Cerramiento de fachada con panel sandwich GALITTA de EUROPERFIL, e=70mm, color a definir por la D.F.
17 Perfil tubular cuadrado de remate, de acero 40x40mm
18 Perfil IPE 600 cortado, anclado al forjado
19 Aislamiento proyectado e=4cm
23 Mortero de cemento
24 Pavimento de terrazo de 40x40cm, colocado a rompe juntas.
25 Goterón de aluminio en el hormigón
26 Hormigón visto de encofrado fenólico, protegido con pintura Hidrofuga
28 Carpintería de aluminio anodizado negro
30 Subestructura de perfil de acero de 80x80mm, con aislamiento incluido
56 Malla de plástico
59 Bloco de hormigón 40x20x20cm (Hidrofugado por la cara exterior)
45 Cubierta tipo Losa FILITROVI R6 de color gris (8cm de espesor)
46 Mortero de cemento impermeabilizante
47 Plancha de aislamiento térmico e=6cm
48 Paramento de cartón-yeso tipo Pladur metal o similar. Con doble placa de 15mm. Acabado pintado.
49 Plancha de acero galvanizado de 50x20, e=8mm
50 Peldaño prefabricado de terrazo
51 Pletina de hierro galvanizado, e=8mm
52 Plancha de acero galvanizado de 50x20, e=8mm
58 Remate perimetral de pendientes de chapa de zinc
59 Chapa de aluminio lacado de color negro
68 Barandilla de madera de pino barnizado de color natural, alam. 50 cm
70 Zócalo de pletina de aluminio plegada en L de 15 x 50mm



BUILDING TECHNOLOGY - MACHINES

MACHINES AND SPECS

Format saw
(Formaatzaag) (2x)
- 84dB

To cut big boards
3,2m x 3,2m

Dimensions: 3,4m
x 3,5m x 1m

Ripper saw
(Schulpzaag) (1x)
- 90 dB

Cutting solid
beams in the length
direction

1m x 0,66m x 1m

Planing machine
(Vlakbank) (1x)
- 90 dB

Chafing solid
pieces of wood to
flatten the piece.

2,2m x 0,41m x 1m

Planing machine
(Vandiktebank) (1x)
- 106 dB

Chafing beams of
wood to flatten the
piece

1m x 0,26 m x 1m

Beltsaw (Lintzaag) (1x)
- 85 dB

For sawing smaller
pieces of wood
(boards) and figures

0,6m x 0,8m x 2m

Crosscut saw
(Afkortzaag) (3x)
- 100 dB

To cut beams and
battens to length, also
possible to cut 45°

0,5m x 0,5 m x 1m
(on top of special
table)

Milling machine
(Kolomboor) (2x)
- 100 dB

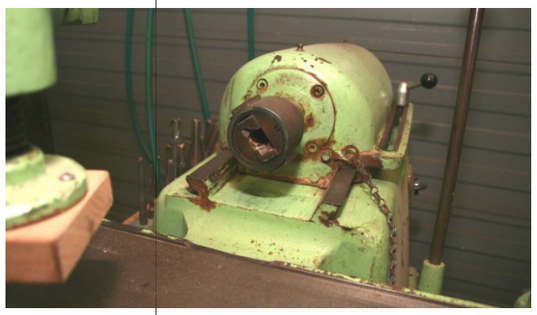
Steady drill multiple
sizes of holes into
pieces of wood

0,4m x 0,6m x 2m

Deep hole
milling machine
(Langgatboor) (1x)
- 95 dB

Drill deep and long
holes and slits into a
piece of wood, doors
for example

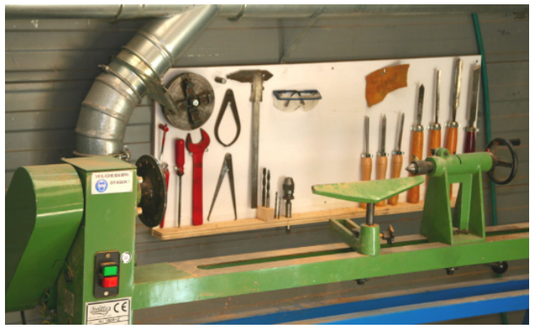
0,5m x 0,5 m x 1m



Wood lathe
(Houtdraaibank) (1x)
- 80 dB

Squared pieces of
wood can here be
chafed into curved
shapes

1,2 m x 0,5m x 1m



Vertical sanding belt
(Verticale
schuurband) (1x)
- 80 dB

Big chafing machine
to flatten the long
sides of a piece of
wood

1,2 m x 1m x 1m

Spindle-moulding
machine
(Tafelfreesmachine)
(1x)
- 100 dB

To make holes, slits
and tilted edges on
big pieces of wood

1,2m x 0,7 m x 1m

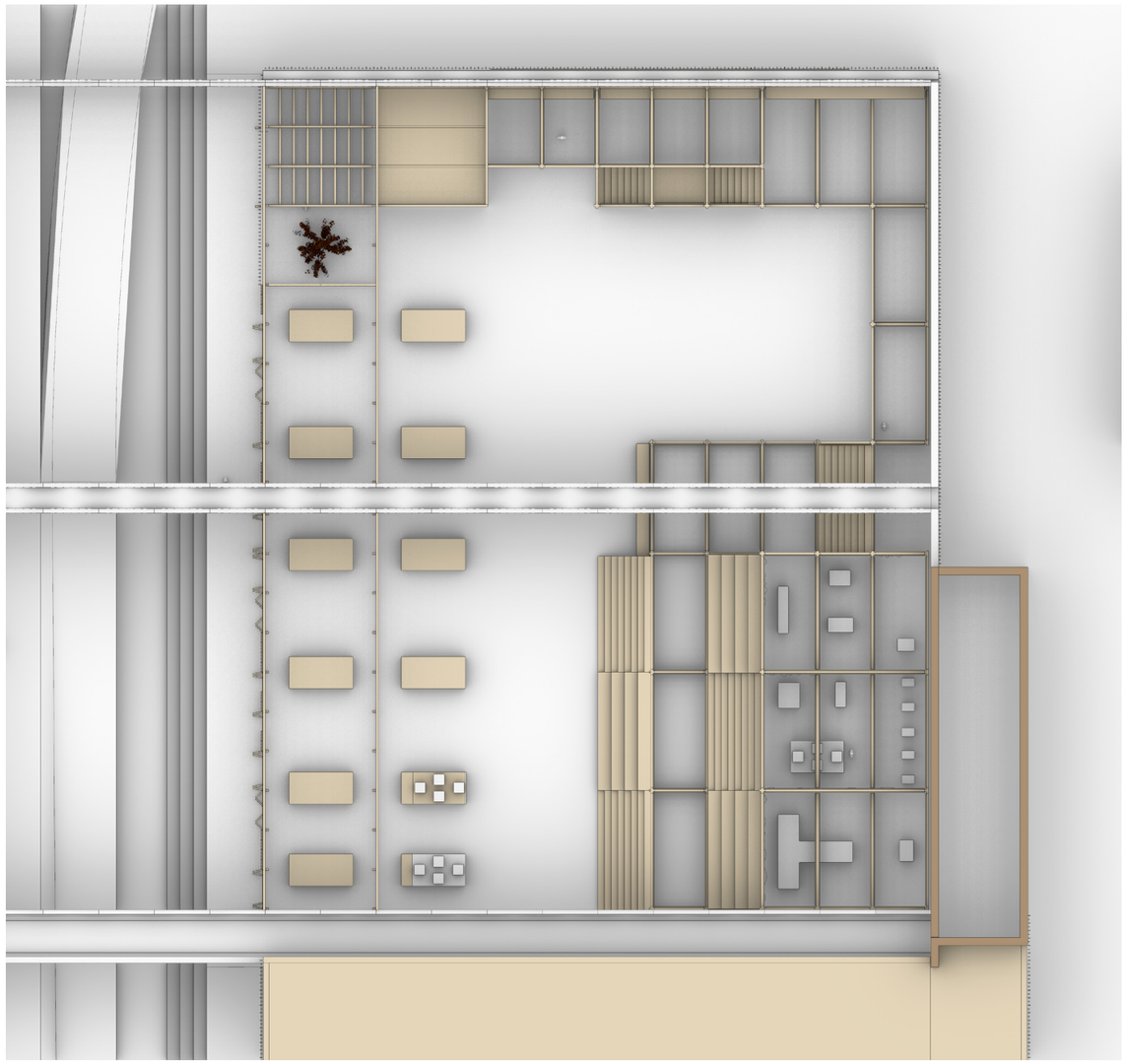
Smaller machines:

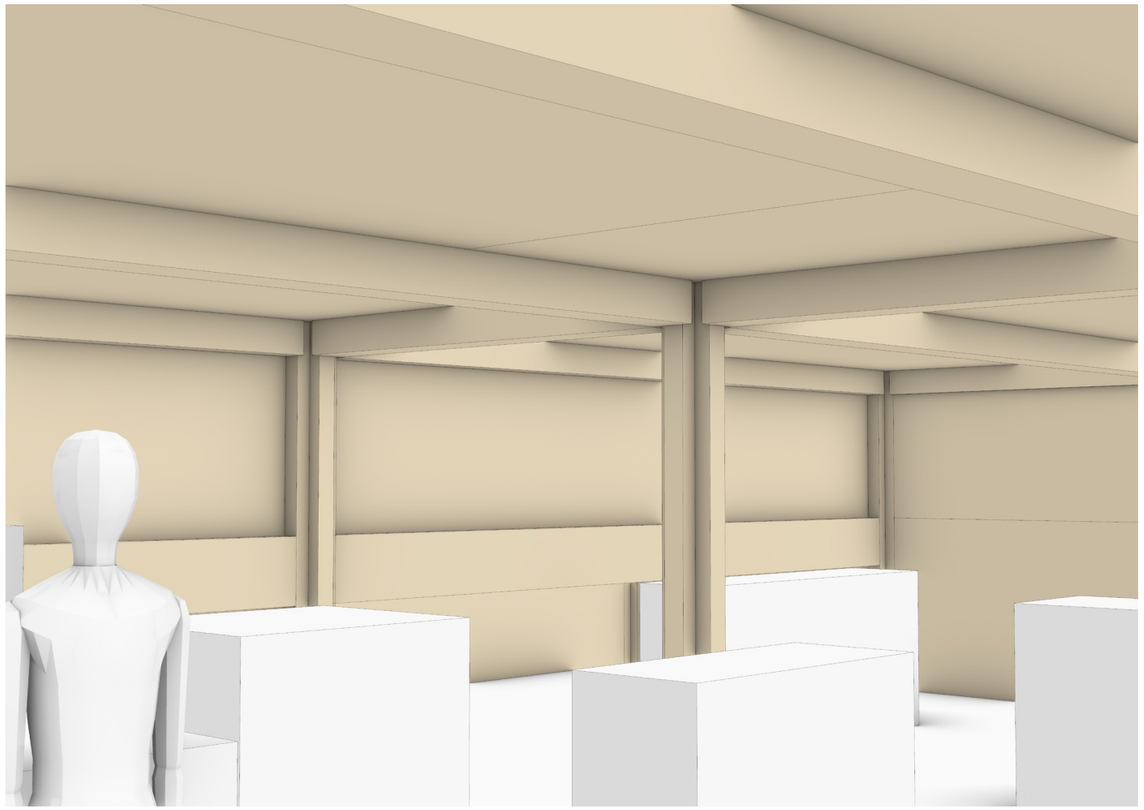
- Jigsaw (3x)
- Sanding machine (2x flat, 2x round)
- Polishing machine (2x)
- Portable machines (storage)

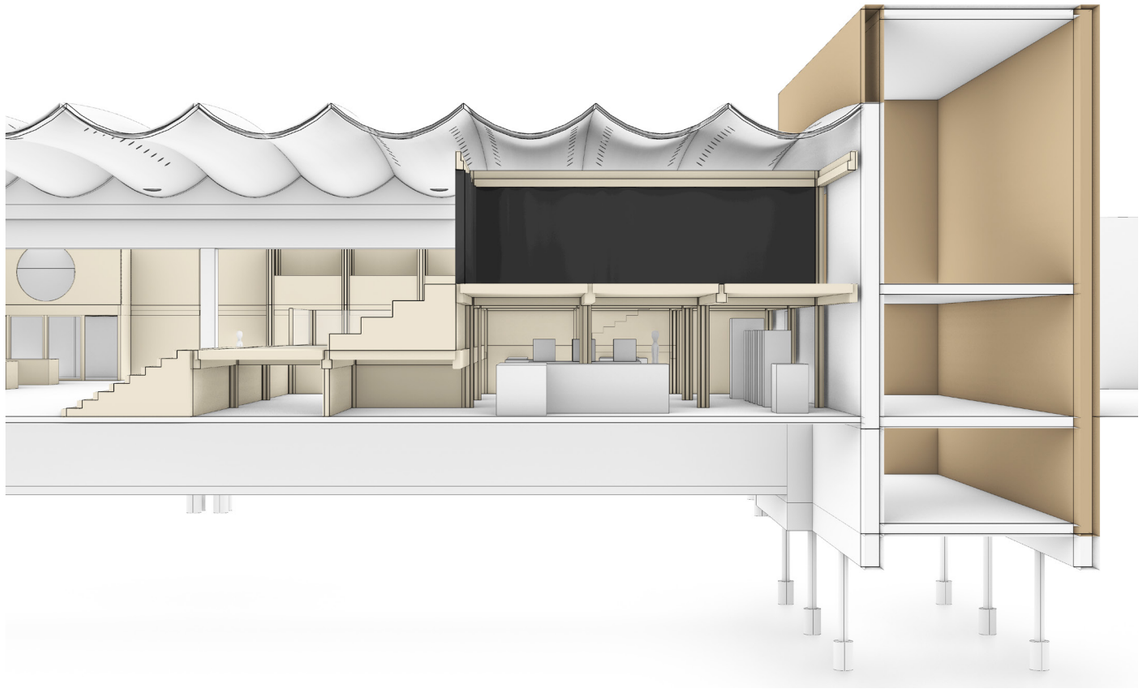
0,5m x 0,5 m x 1m (on top of special table)

ARCHITECTURE - MACHINES

MACHINES WORKING SPACE

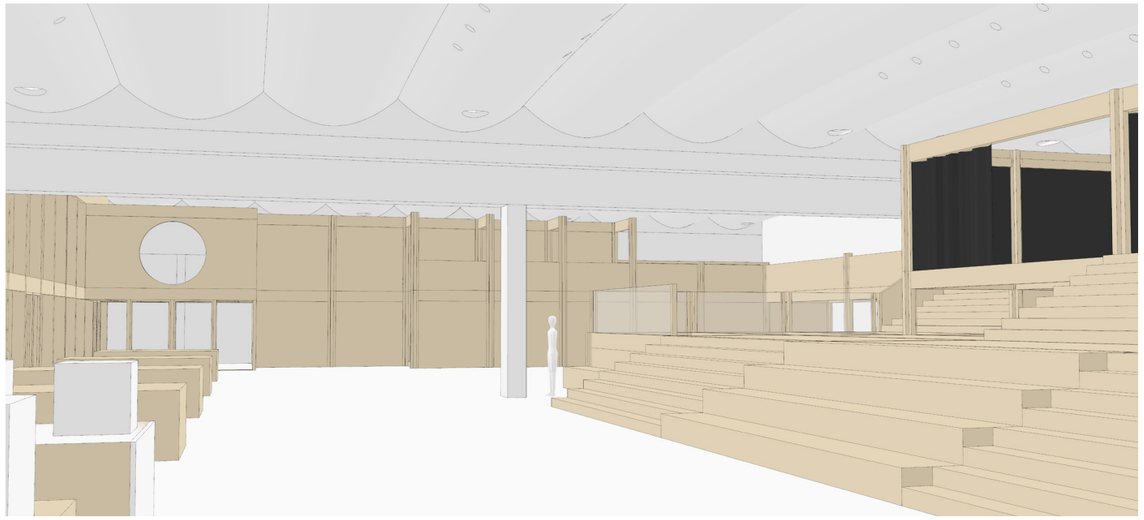


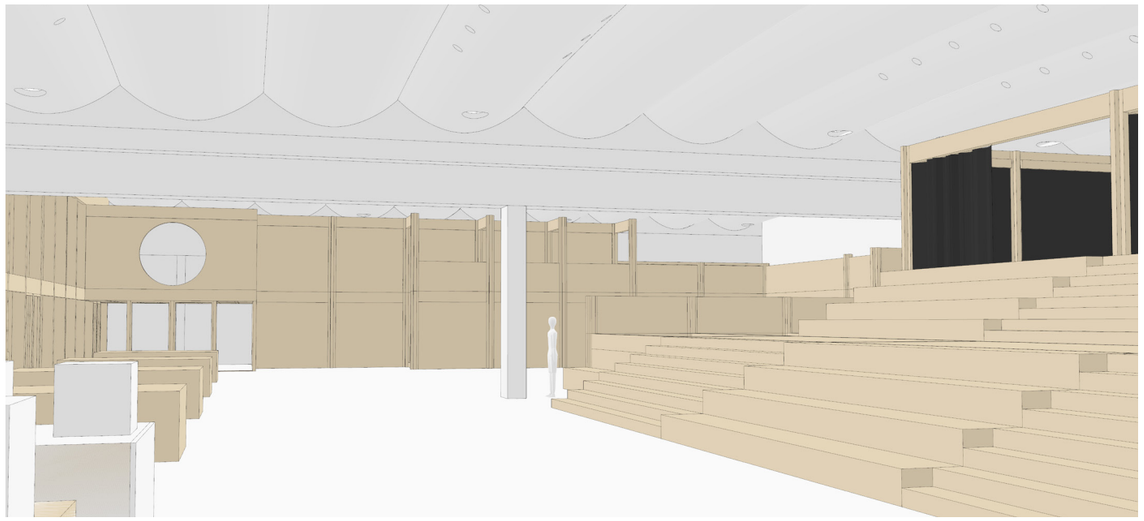




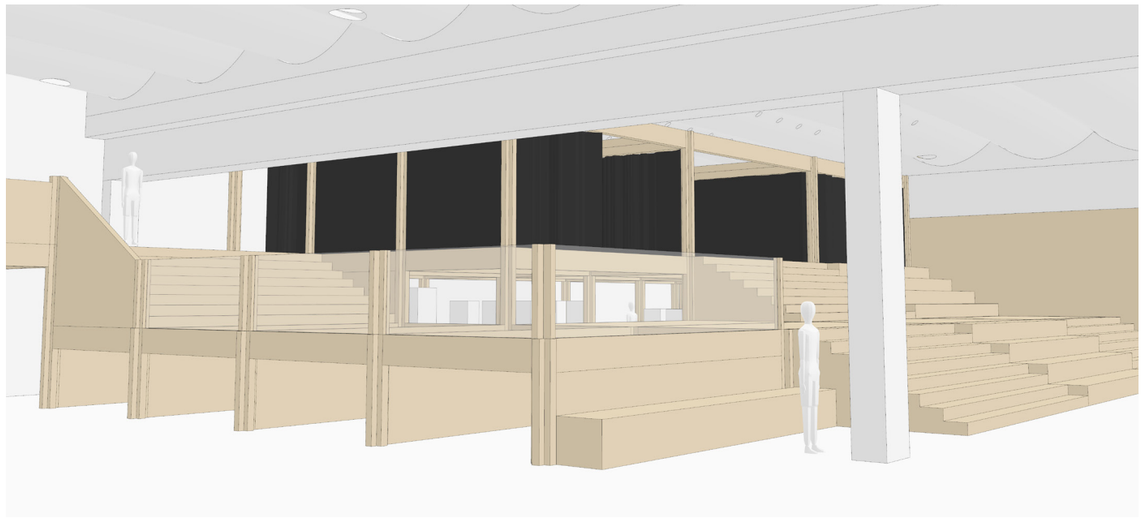
ARCHITECTURE

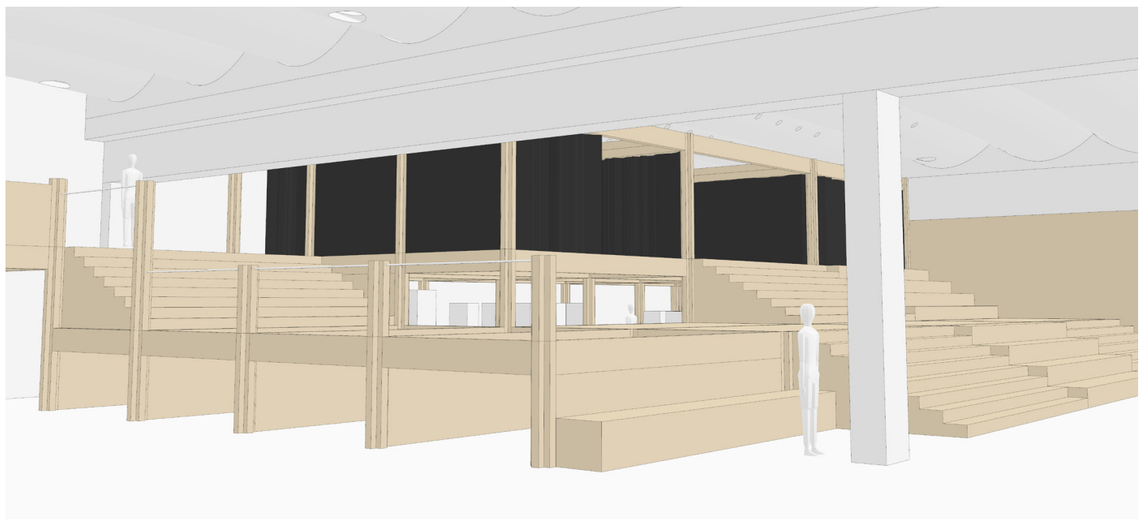
MACHINES WORKING SPACE

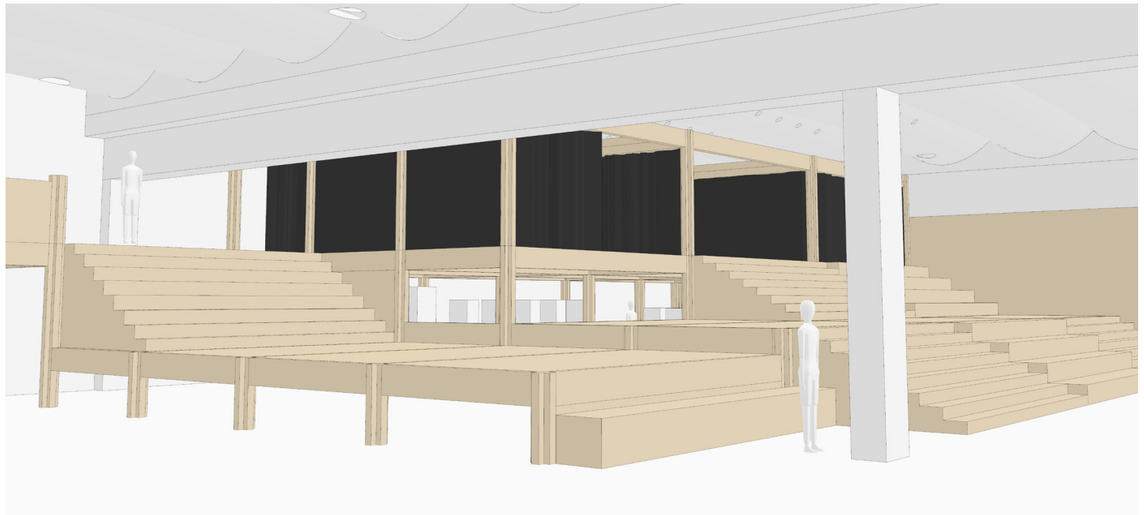


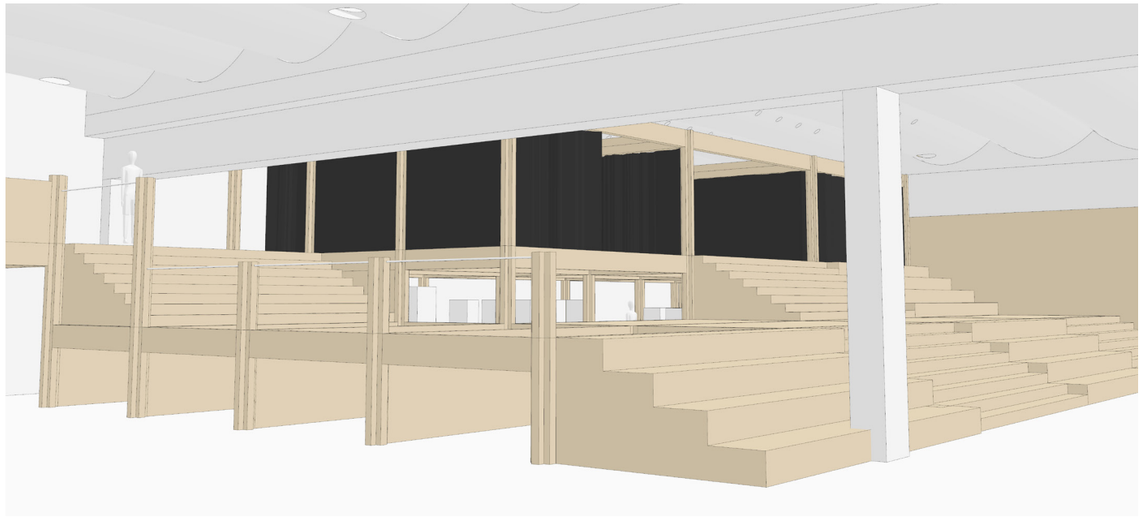


ARCHITECTURE

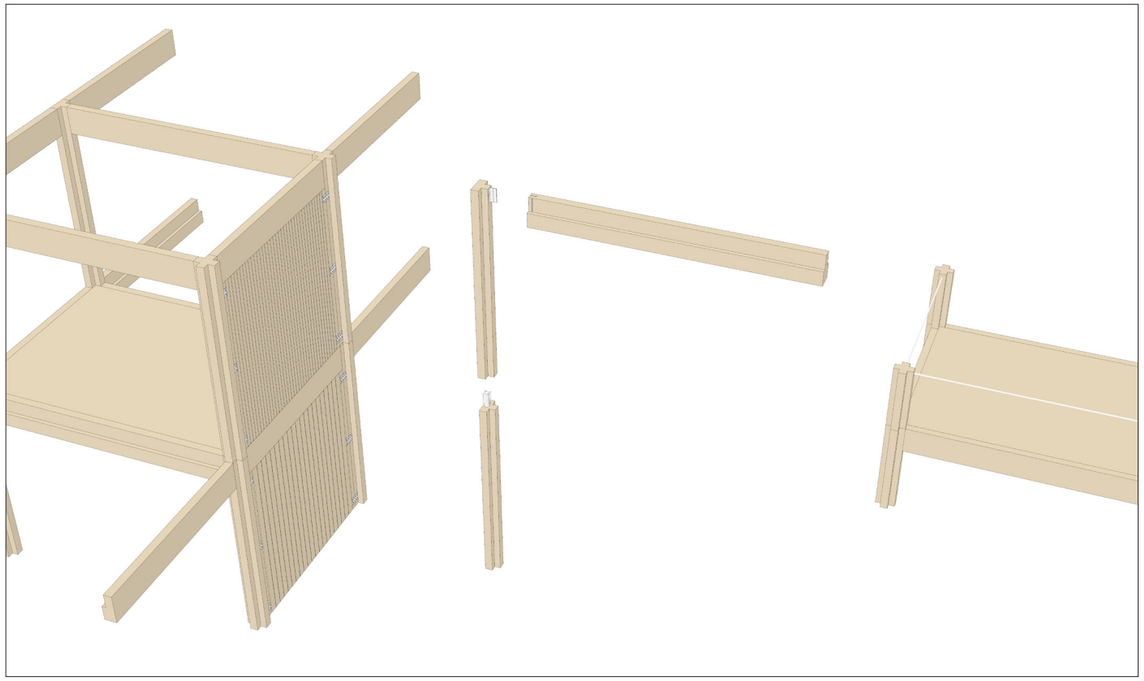


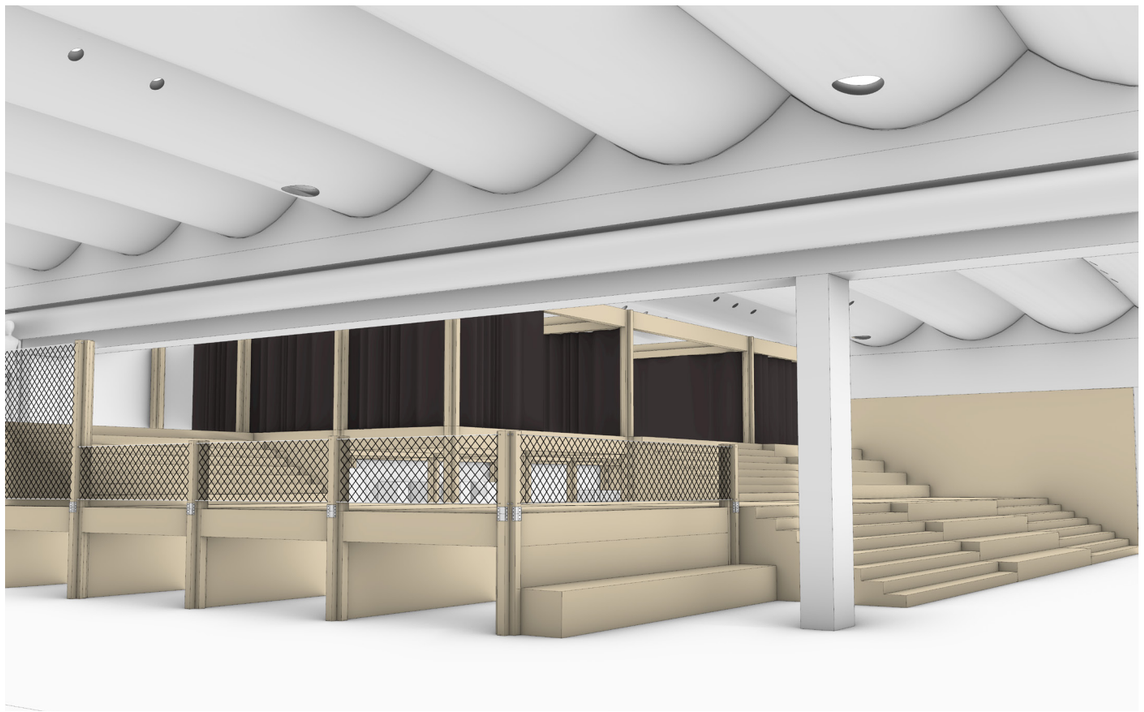


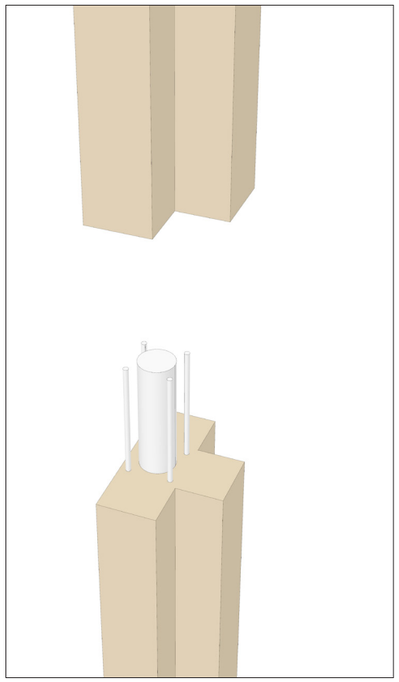


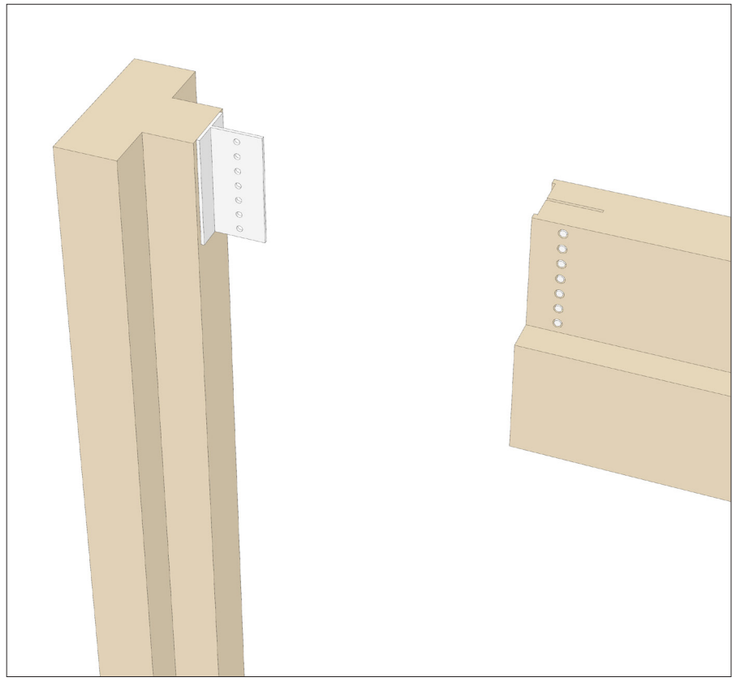


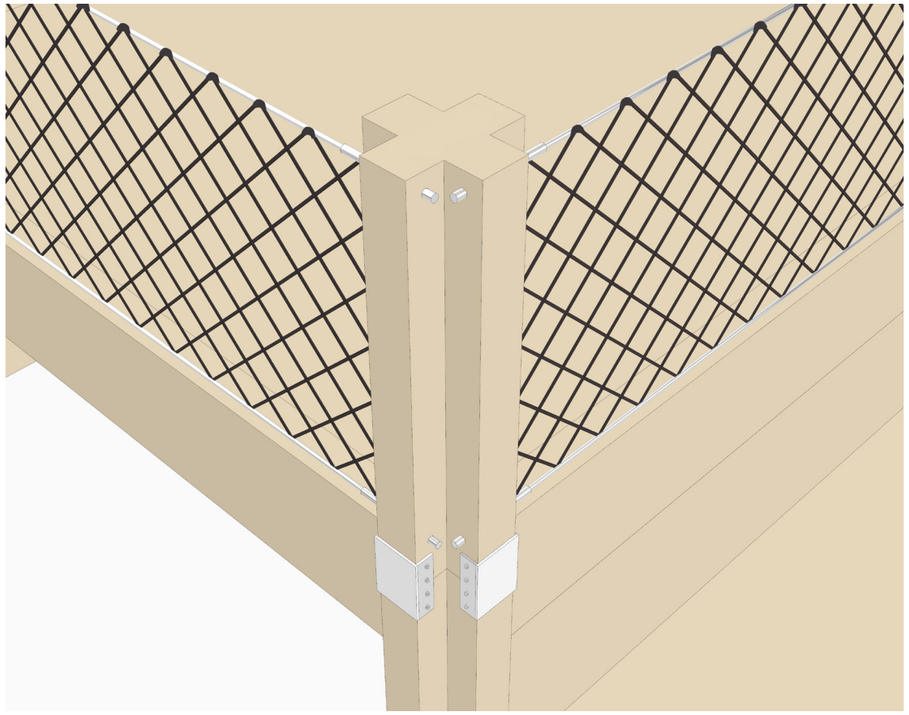
ARCHITECTURE - STRUCTURE





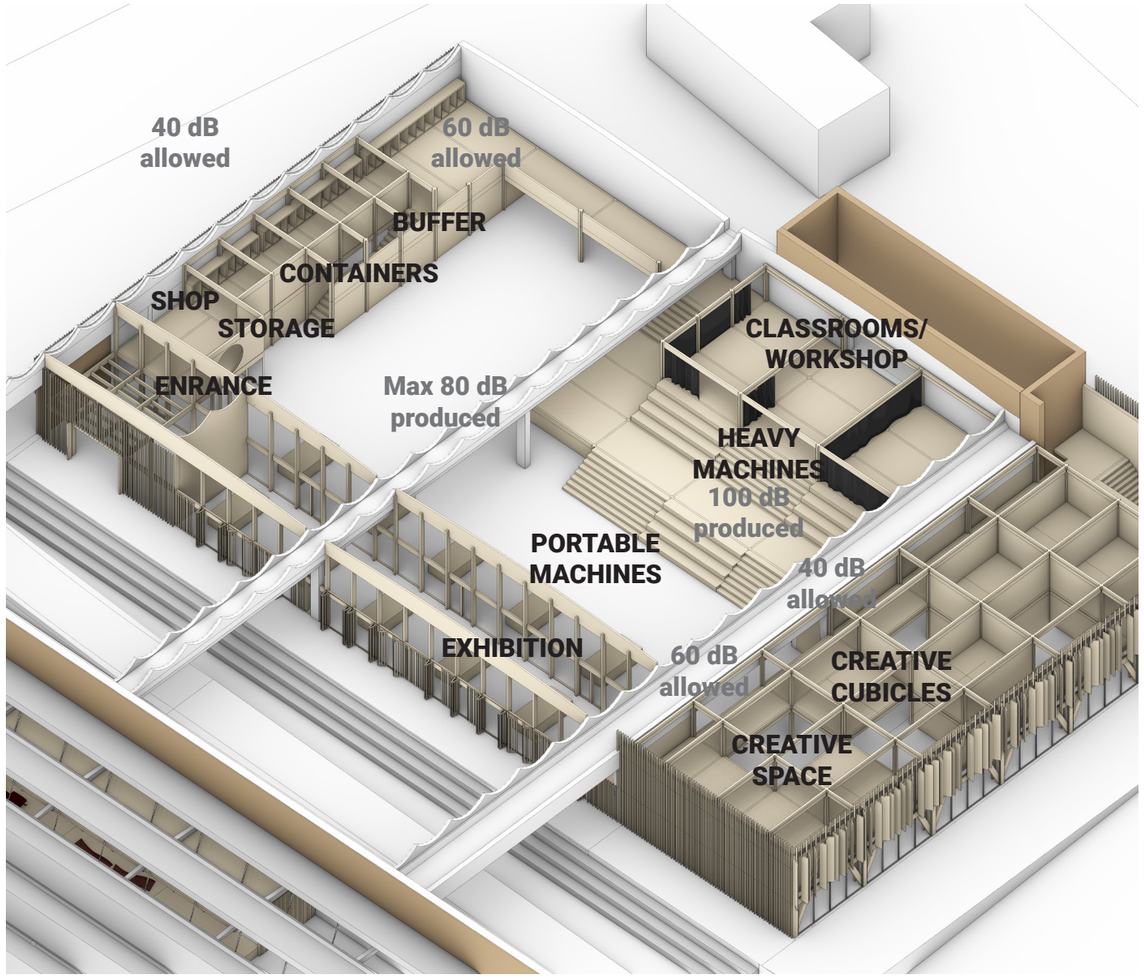




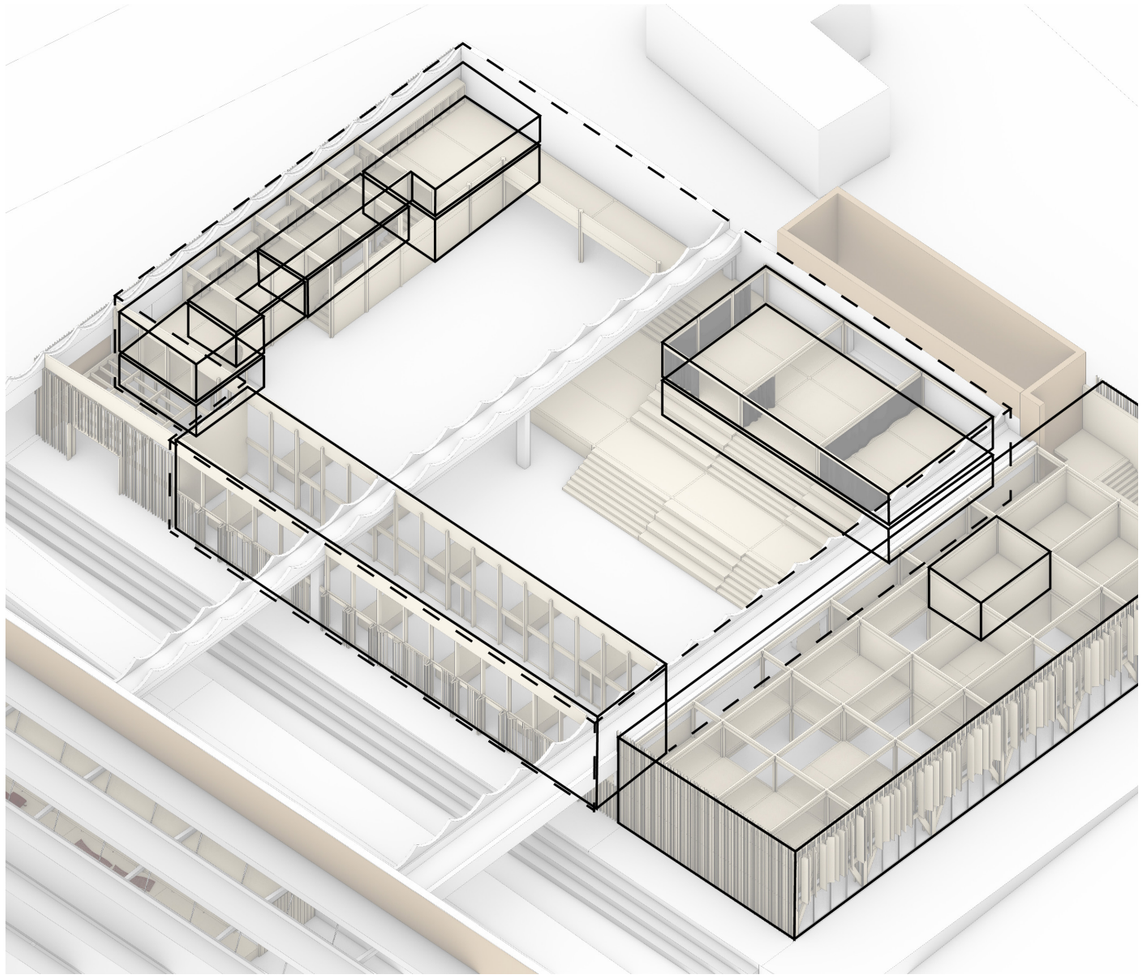


BUILDING TECHNOLOGY - ACOUSTICS

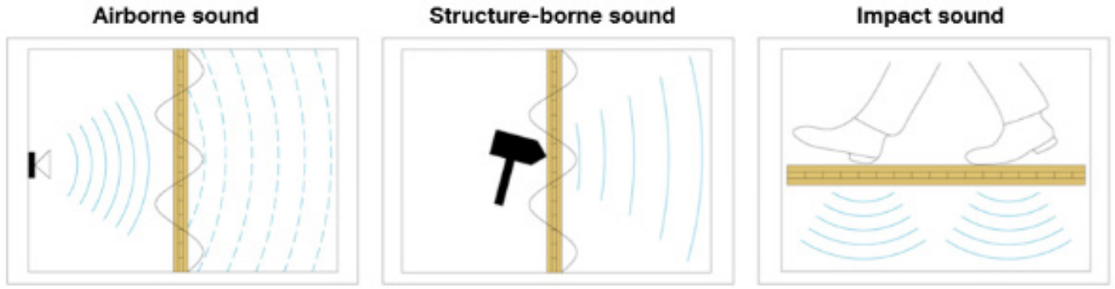
FUNCTIONS AND ALLOWED NOISE

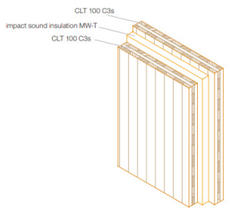


SPACES AND COMPARTMENTS



BUILDING TECHNOLOGY - ACOUSTICS



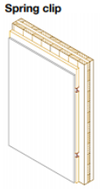


CLT non-faced wall

100 mm **Stora Enso CLT**

R_w ($C;C_{Tr}$): 34 (–1;–3) dB

Spring clip



100 mm **Stora Enso CLT**
27 mm spring clip
12.5 mm fire-protection plasterboard

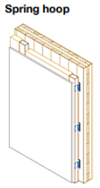
R_w ($C;C_{Tr}$): 48 (–5;–12) dB

Fire protection plaster board on one side

100 mm **Stora Enso CLT**
12.5 mm fire-protection plasterboard

R_w ($C;C_{Tr}$): 37 (–1;–3) dB

Spring hoop



100 mm **Stora Enso CLT**
3 mm joint sealing tape
50 mm spring clip with an intermediate layer of mineral wool
12.5 mm fire-protection plasterboard

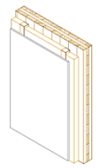
R_w ($C;C_{Tr}$): 51 (–2;–8) dB

Fire protection plaster board on both sides

2.5 mm fire-protection plasterboard
100 mm **Stora Enso CLT**
12.5 mm fire-protection plasterboard

R_w ($C;C_{Tr}$): 37 (–1;–3) dB

Wooden battens

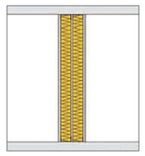


100 mm **Stora Enso CLT**
50 mm wooden batten (intermediate layer of mineral wool)
12.5 mm fire-protection plasterboard

R_w ($C;C_{Tr}$): 45 (–1;–5) dB

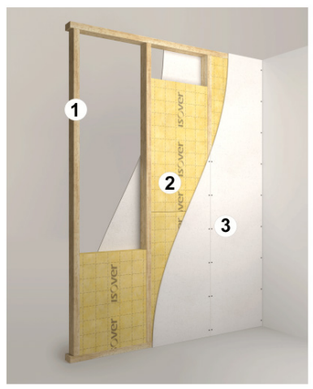
De mate waarin een materiaal geluid kan isoleren wordt over het algemeen aangegeven met de geluidreductiewaarde Rw in decibel. Hierbij geldt hoe hoger de R-waarde, hoe beter de geluidsisolatie. Een Rw van 40 dB zorgt ervoor dat bij een luchtgeluid van 60 dB binnen slechts 20 dB hiervan te horen is.

Rw: 40 dB --> Geluid 60 dB --> Over: 20dB



Aanbevolen constructie	Dikte
2 x Gyproc gipskartonplaten 12,5 mm	25 mm
2 x Isover glaswol 100 mm	200 mm
2 x Gyproc gipskartonplaten 12,5 mm	25 mm

Akoestische presatie	dB
R_w ($C;C_{Tr}$)	69 (-3, -10)



VOORDELEN

- Goede geluidsisolatie
- Eenvoudige installatie
- Stevige isolatieplaat met snijlijnen en comfortvlies

OVERIGE INFORMATIE

Handige tips

- Een wand van Gyproc GypFrame® profielen heeft een hogere geluidsisolatie dan een wand met houten stijlen regelwerk.
- Gyproc gipsplaatsystemen voor wanden, plafonds en vloeren zijn eenvoudig te monteren. Dankzij het lage gewicht zijn ze vrijwel overal toepasbaar. Ze kenmerken zich door een goede geluidsisolatie en brandwerendheid. Gyproc gipsplaten geven een mooi strak en vlak eindresultaat en vormen de ideale ondergrond voor elke afwerking.
- Isover glaswol isoleert geluid even goed als zwaardere steenwol. Dit heeft akoestisch onderzoek aangetoond. Lichte scheidingswanden functioneren immers door middel van het zogenaamde massa-veer-massa principe.
- Massa-veer-massa systemen presteren op het gebied van geluidsisolatie vaak beter dan massieve constructies. De prestaties worden nog verder verhoogd als er gekozen wordt om de gehele spouw te vullen met Isover glaswol, omdat glaswol uitermate geschikt is voor akoestische isolatie.

Brandwerendheid

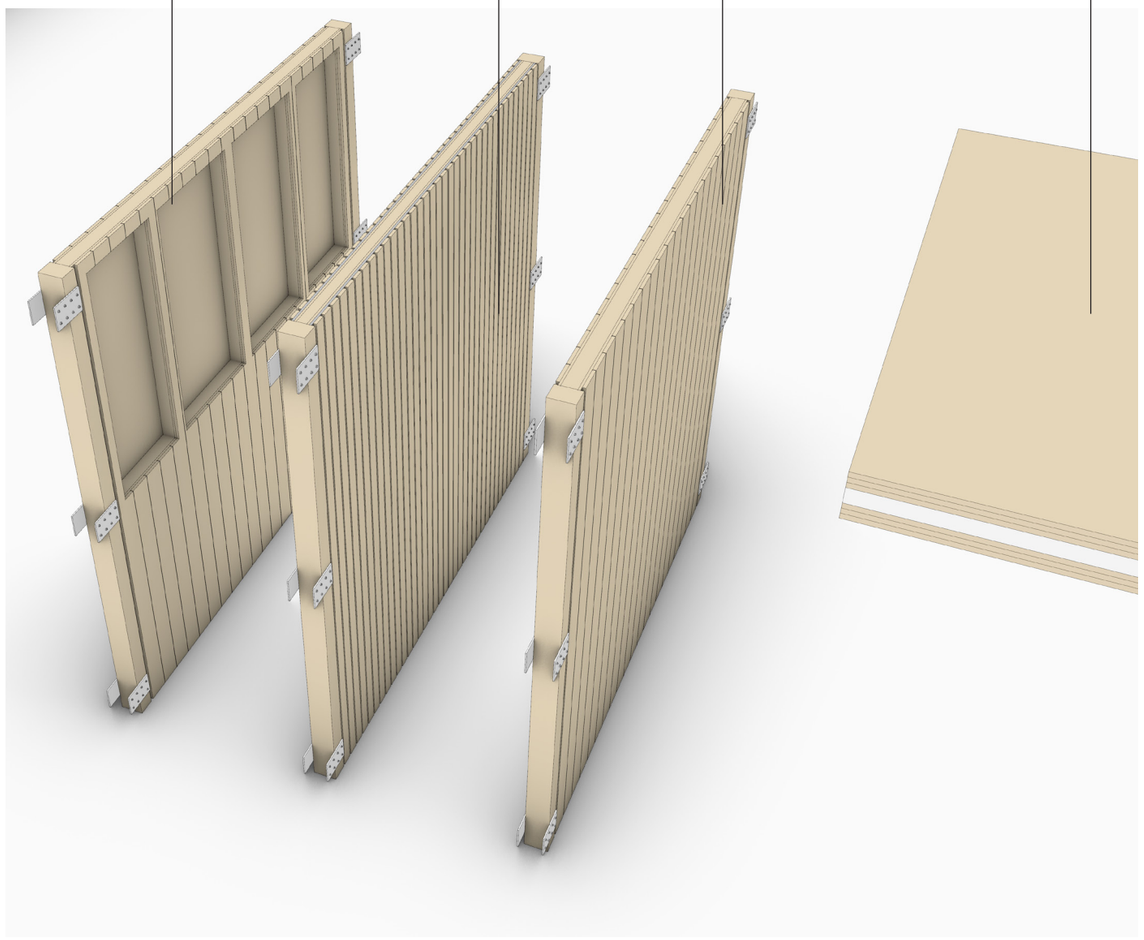
Brandwerendheid	Isolatie	Opbouw
≥ 60 minuten brandwerend	Comfortpanel	2 x 12,5 mm Gyproc gipskartonplaten aan beide zijden
≥ 30 minuten brandwerend	Comfortpanel	1 x 12,5 mm Gyproc gipskartonplaat aan beide zijden

Akoestisch

Geluidsisolatie	Spouwbreedte in mm	Isolatie	Opbouw
R_w 36 dB**	75	Comfortpanel 45 mm*	1 x 12,5 mm Gyproc gipskartonplaten aan beide zijde

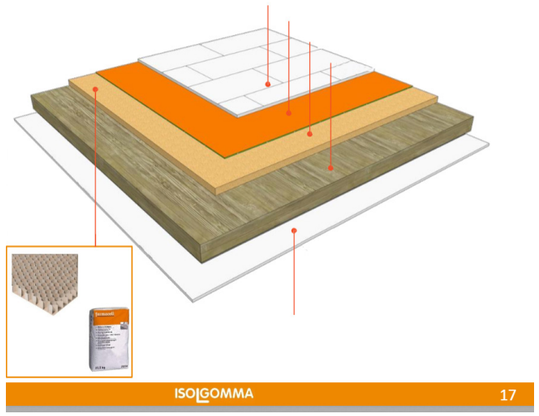
*Bij toepassing van Comfortpanel 45 mm in een spouw van 50 mm is de gewogen luchtgeluidsisolatie (R_w), 50 respectievelijk 42 dB
**R_w = gewogen luchtgeluidsisolatie

Geluidsniveau's in dB:			
0dB	Absolute stilte, gehoorgrens	90dB	Stereotoren op vol vermogen
10dB	Net waarneembare geluiden	100dB	Popconcert, discotheek
20dB	Ruisen van de wind	110dB	Racewagen
30dB	Basisniveau professionele opnamestudio	120dB	Pijngrens
40dB	Rustige woonwijk (homestudio)	130dB	**Blijvende gehoorschade**
60dB	Gespreksniveau	130dB	Helicopter
80dB	Auto, intensief wegverkeer	150dB	Explosie
		190dB	Raket

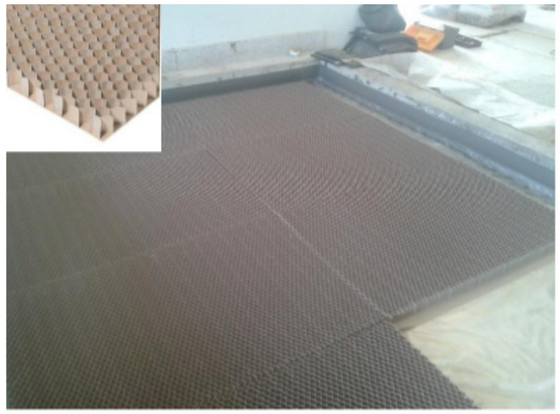


BUILDING TECHNOLOGY - ACOUSTICS

BUILT-UP FLOOR CREATIVE CUBICLES



- Fermacell 2E22 gipsvezelplaat
- Cork sound insulation
- Honeycomb cardboard structure 6cm (infill 1500 kg/m³ / 90 kg/m²)
- CLT solid floor panel



FORBO FLOOR CREATIVE CUBICLES

From the website of Forbo Flooring:

Marmoleum is de eerste vloer die 100% CO2-neutraal wordt geproduceerd en draagt dus niet bij aan de klimaatverandering. Bovendien biedt slimme recycling van de linoleum-vloeren tal van mogelijkheden.

De laatste circulaire ontwikkelingen
Marmoleum bestaat uit natuurlijke, herwinbare grondstoffen. Het lijnzaad en de juteplant nemen CO2 op om te groeien. Daarnaast is het gebruik van fossiele brandstoffen tijdens de productie verlaagd en de relatie met toeleveranciers aanzienlijk verduurzaamd. Dit heeft ervoor gezorgd dat Marmoleum CO2 neutraal geproduceerd wordt.

Snijafval verzamelen
Met het Marmoleum Recycle programma wordt snijafval verzameld. Het restafval wordt weer gebruikt in de productie van nieuwe vloeren. Met oude vloeren lukt dat vaak niet, vanwege bijvoorbeeld lijm- en betonresten. Een logische vervolgstap is dan ook om hier een oplossing voor te bedenken en een volledig circulair product te maken.

Waardevol restmateriaal verwerken tot nieuw product
Sinds vorig jaar is Jaromir van Vliet - die eerder een student challenge reststroom Marmoleum heeft gedaan voor Forbo - aan de slag gegaan met twee vragen. Hoe kunnen we waardevol materiaal halen uit de vloer? En, Hoe kunnen we dit materiaal verwerken tot een product?

Biocomposiet
Zowel de lijnolie als de boomhars uit Marmoleum is opnieuw inzetbaar. Boomhars kun je week maken en daarna weer hard maken. Zo kun je het telkens op nieuw gebruiken. Het lukt nu al om met deze oude restmaterialen een nieuwe biocomposiet te maken. Er hoeft niet persé een nieuwe vloer gemaakt te worden van dit biocomposiet, maar kan bijvoorbeeld ook gebruikt worden als plaatmateriaal voor een mooi meubelstuk. Hiervoor wordt gekeken naar samenwerkingen met andere bedrijven.

Leasevloeren
Daarnaast wil Forbo ook ‘vloeren-als-een-service’ gaan aanbieden: een leasevloer. Een systeem waarbij je betaalt voor gebruik in plaats van bezit. Dit is een tendens dat bij steeds meer producten aangeboden wordt. En waarom niet bij de Linoleum-vloeren. Zo houden wij controle over het materiaal, wat betreft onderhoud maar ook als de vloer uiteindelijk weer verwijderd moet worden.

ARCHITECTURE - PANELS

BUILDING TECHNOLOGY - VENTILATION

VENTILATION SUPPLY DUCTS

v_{supply}	4,0 m/s				
$v_{exhaust}$	4,5 m/s	$Q_{industry}1$	60 m^3/h	$Q_{kitchen}$	75 m^3/h
Q_{person}	25 m^3/h	$Q_{industry}2$	45 m^3/h	Q_{shower}	50 m^3/h

Occupancy rate

B1	0,8 m^2 per person
B2	2 m^2 per person
B3	5 m^2 per person
B4	12 m^2 per person
B5	30 m^2 per person

Room	Rate	Surface area	People	$Q_{supply;needed}$	*n*		$Duct_{supply}$
Workshop 1	B5	127 m^2	4 personen · 60 m^3/h	254 m^3/h	3	0,21 m/s	0,05 m^2
Workshop 2	B4	988 m^2	82,3333 personen · 60 m^3/h	4.940 m^3/h	2	2,74 m/s	0,69 m^2
Workshop 3	B4	150 m^2	12,5 personen · 60 m^3/h	750 m^3/h	2	0,42 m/s	0,10 m^2
Extension	B4	650 m^2	54 personen · 45 m^3/h	2.438 m^3/h	2	1,35 m/s	0,34 m^2
Kitchen	B3	12 m^2	6 personen · 75 m^3/h	450 m^3/h		0,13 m/s	0,03 m^2
Toilets/shower (ws)	B3	8 m^2	1,6 personen · 50 m^3/h	80 m^3/h		0,02 m/s	0,01 m^2
Toilets (cc)	B3	8 m^2	4 personen · 25 m^3/h	100 m^3/h		0,03 m/s	0,01 m^2

Workshop 1

A = 0,05 m^2

1 duct à 0,05 m^2

259,634 mm | 250 mm

Where? Existing

1 duct in horizontal shaft under floor

Workshop 1+ Workshop 2 + Workshop 3

A = 0,84 m^2

2 ducts à 0,42 m^2

732,848 mm | 800 mm

Where? Existing

2 ducts in horizontal shaft under floor

Extension

A = 0,34 m^2

2 ducts à 0,17 m^2

Width 0,40 m

Height 0,42 m

Where? New

1 duct below the roof and 1 duct below the ground floor

Kitchen

A = 0,03 m^2

1 duct à 0,03 m^2

199,522 mm | 200 mm

Where? Existing

1 duct under ceiling

Toilets/shower

A = 0,01 m^2

1 ducts à 0,01 m^2

84,1257 mm | 80 mm

Where? Existing

1 duct in installations building

Toilets

A = 0,01 m^2

1 duct à 0,01 m^2

94,0554 mm | 100 mm

Where? Existing

1 duct in installations building

Available duct sizes (diameter):	
63 mm	315 mm
80 mm	400 mm
100 mm	500 mm
125 mm	630 mm
160 mm	800 mm
200 mm	1000 mm
250 mm	1250 mm

VENTILATION EXHAUST DUCTS

v_{supply}	4,0 m/s				
$v_{exhaust}$	4,5 m/s	$Q_{industry}1$	60 m^3/h	$Q_{kitchen}$	75 m^3/h
Q_{person}	25 m^3/h	$Q_{industry}2$	45 m^3/h	Q_{shower}	50 m^3/h

Occupancy rate

B1	0,8 m^2 per persoon
B2	2 m^2 per persoon
B3	5 m^2 per persoon
B4	12 m^2 per persoon
B5	30 m^2 per persoon

Room	Rate	Surface area	People	$Q_{exhaust;needed}$	*n*		$Duct_{exhaust}$
Workshop 1	B5	127 m^2	4 personen · 60 m^3/h	254 m^3/h	2	0,14 m/s	0,03 m^2
Workshop 2	B4	988 m^2	82,3333 personen · 60 m^3/h	4.940 m^3/h	1	1,37 m/s	0,30 m^2
Workshop 3	B4	150 m^2	12,5 personen · 60 m^3/h	750 m^3/h	1	0,21 m/s	0,05 m^2
Extension	B4	650 m^2	54 personen · 45 m^3/h	2.438 m^3/h	2	1,35 m/s	0,30 m^2
Kitchen	B3	12 m^2	6 personen · 75 m^3/h	450 m^3/h		0,13 m/s	0,03 m^2
Toilets/shower (ws)	B3	8 m^2	1,6 personen · 50 m^3/h	80 m^3/h		0,02 m/s	0,00 m^2
Toilets (cc)	B3	8 m^2	4 personen · 25 m^3/h	100 m^3/h		0,03 m/s	0,01 m^2

Keuken	3000 m^3/h	0,13 m/s	0,03 m^2
Toilets/shower (v	300 m^3/h	0,02 m/s	0,00 m^2
Toilets (cc)	300 m^3/h	0,03 m/s	0,01 m^2

Workshop 1

A = 0,03 m^2

1 duct à 0,03 m^2

199,866 mm | 200 mm

Where? Existing

1 duct in horizontal shaft under floor

Workshop 1+ Workshop 2 + Workshop 3

A = 0,38 m^2

2 ducts à 0,19 m^2

493,649 mm | 500 mm

Where? Existing

2 ducts in horizontal shaft under floor

Extension

A = 0,30 m^2

2 ducts à 0,15 m^2

Width 0,40 m

Height 0,38 m

Where? New

1 duct below the roof and 1 duct below the ground floor

Kitchen

A = 0,03 m^2

1 duct à 0,03 m^2

188,111 mm | 200 mm

Where? Existing

1 duct under ceiling

Toilets/shower

A = 0,00 m^2

1 ducts à 0,00 m^2

79,3145 mm | 80 mm

Where? Existing

1 duct in installations building

Toilets

A = 0,01 m^2

1 duct à 0,01 m^2

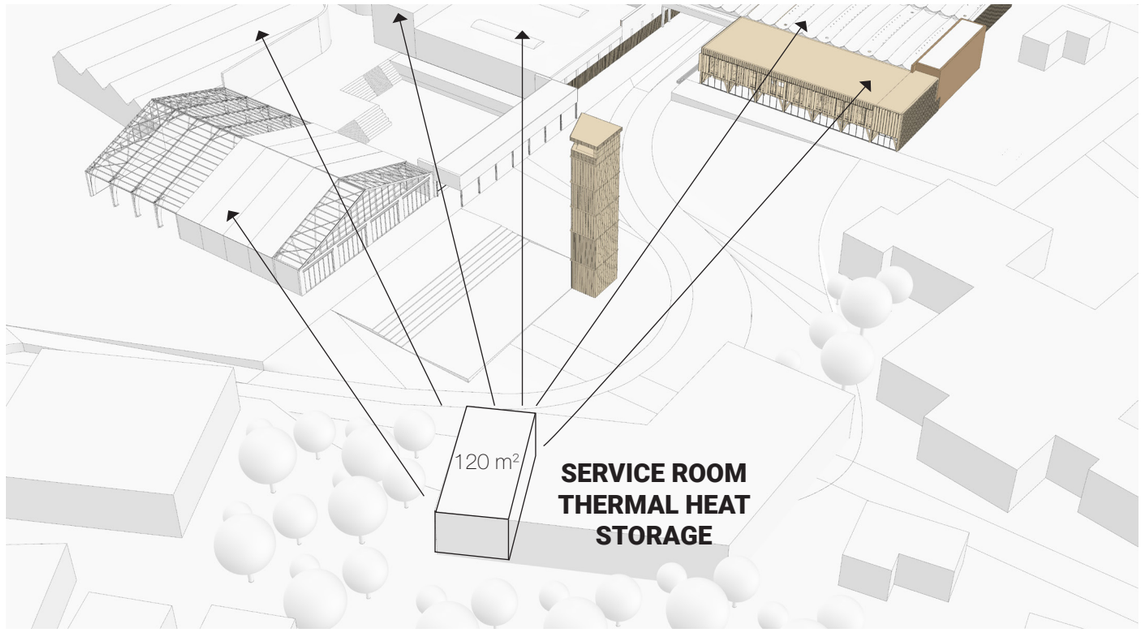
88,6763 mm | 100 mm

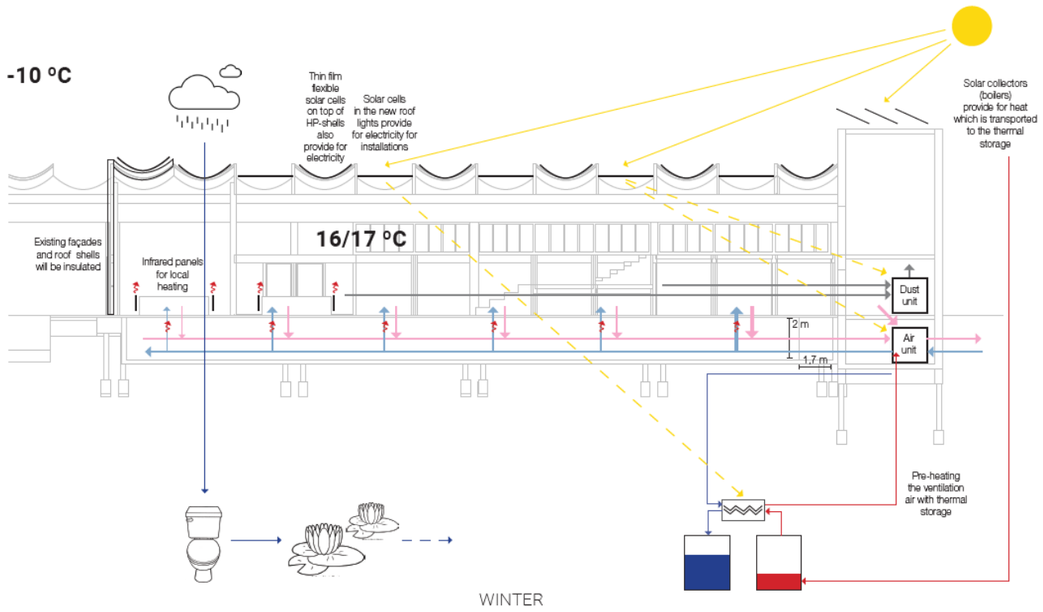
Where? Existing

1 duct in installations building

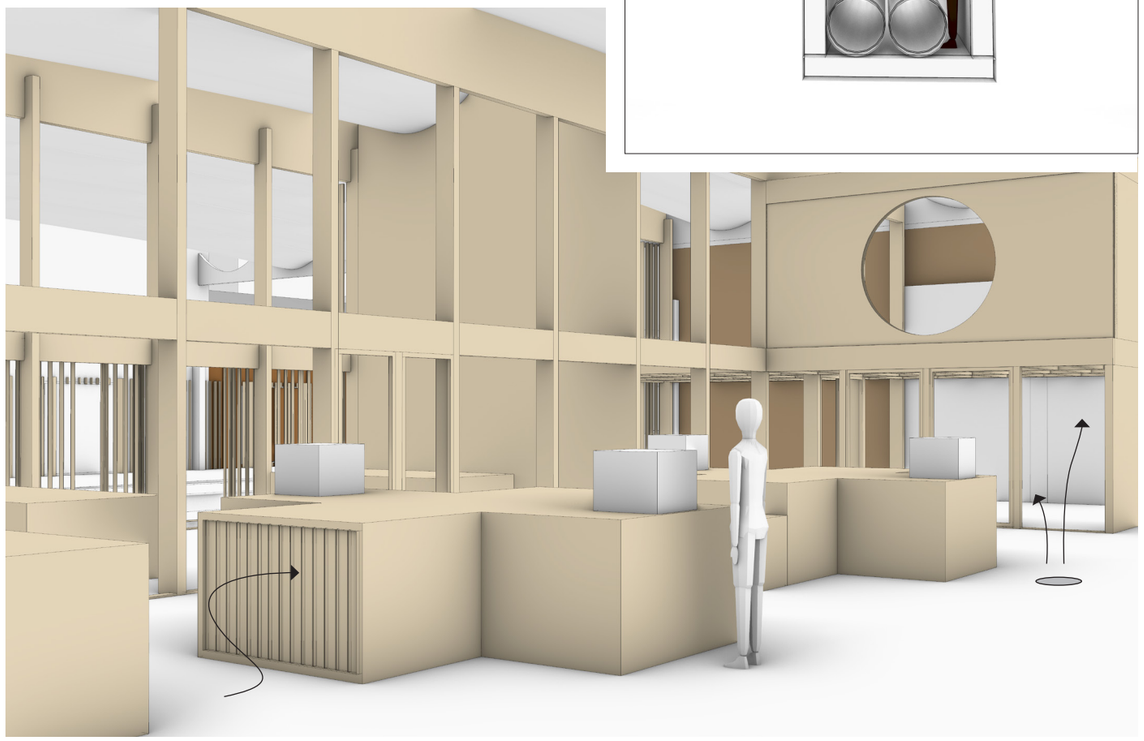
BUILDING TECHNOLOGY - SYSTEM

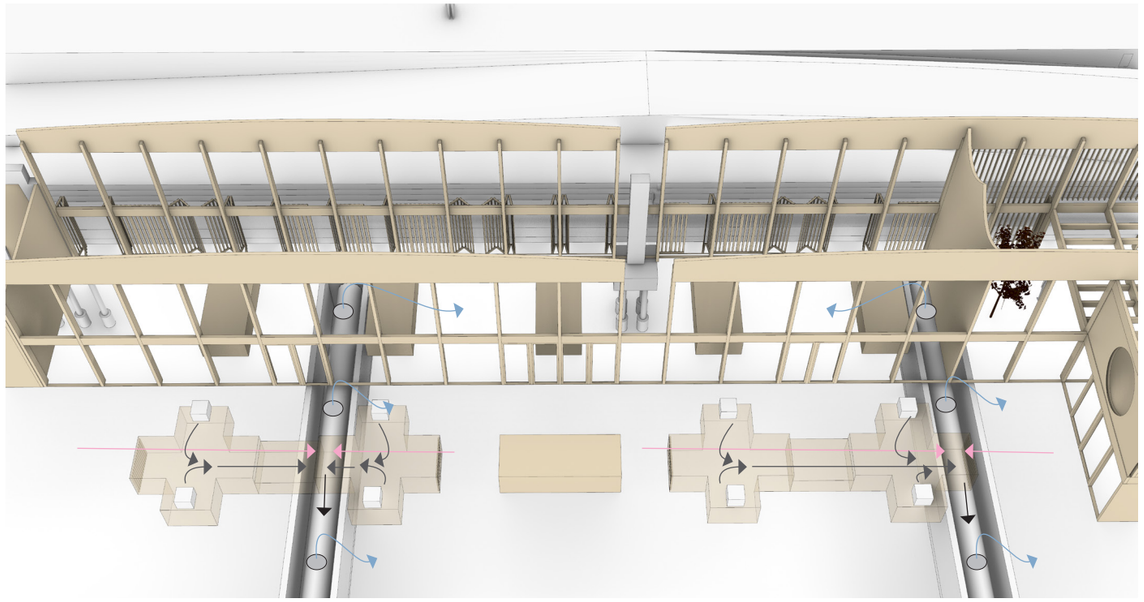
CLIMATE SYSTEMS





WINTER

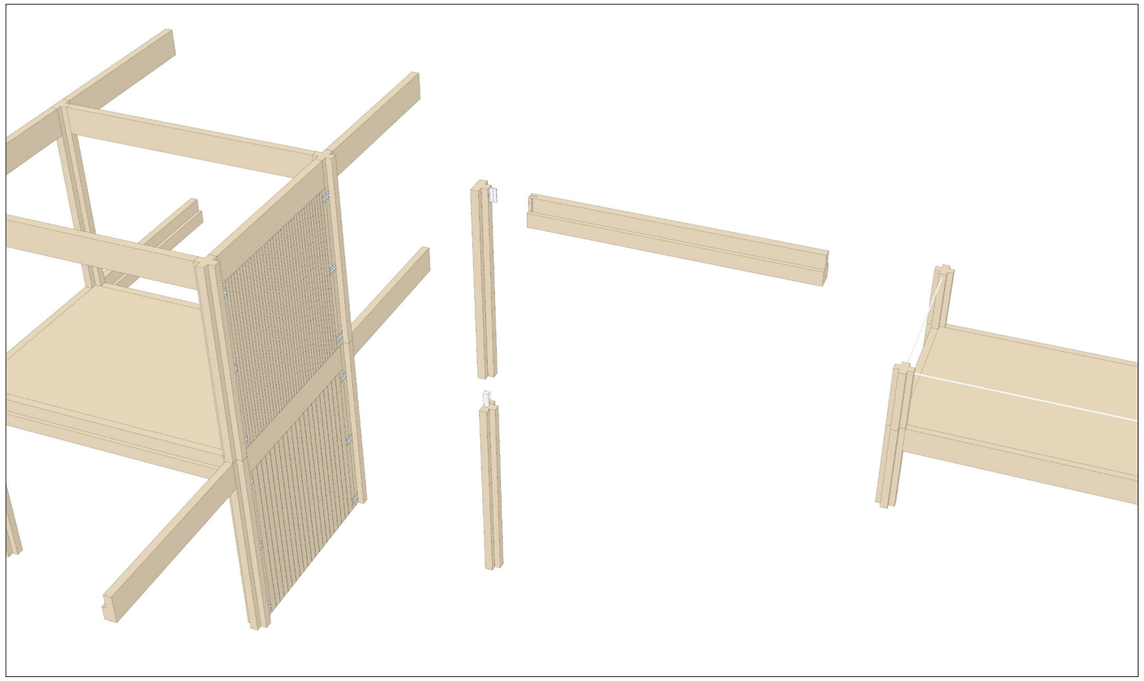


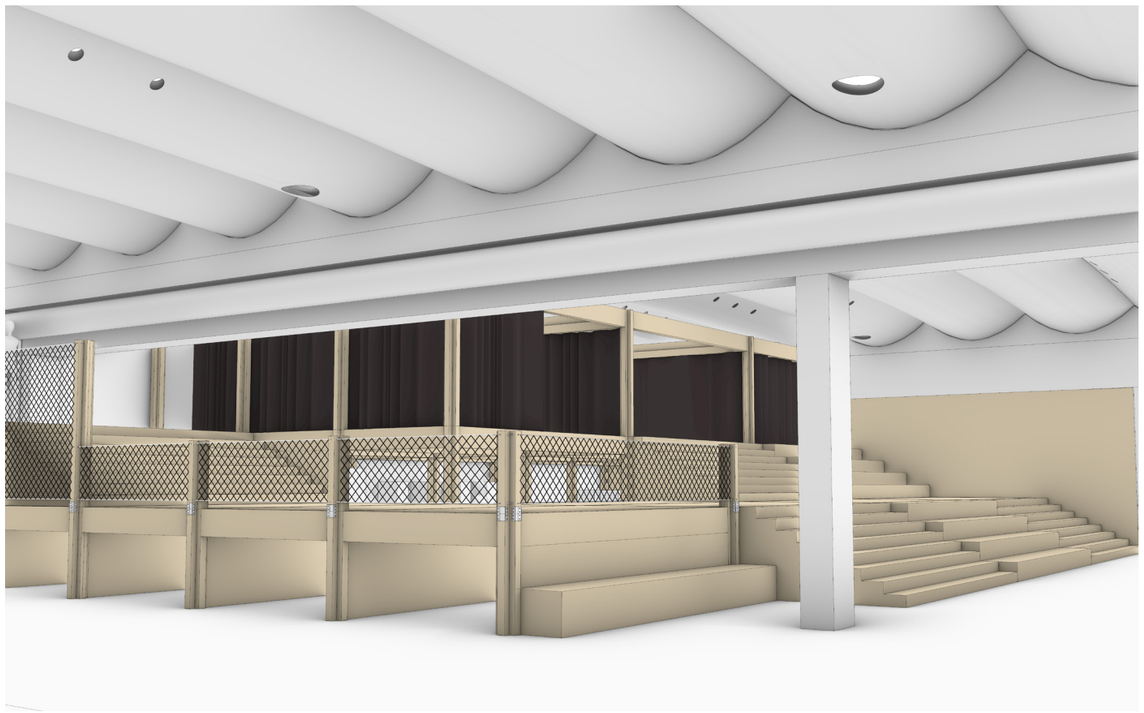


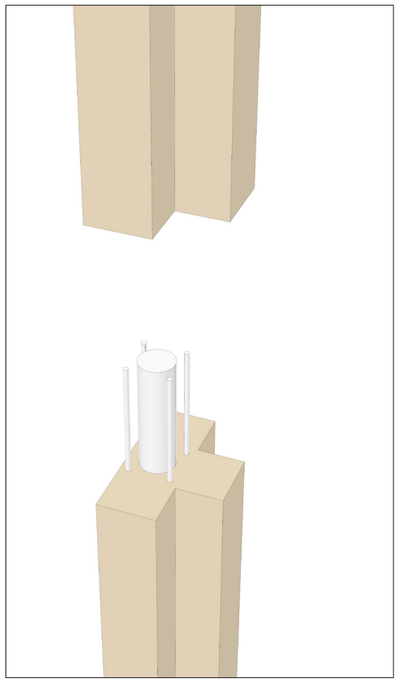
TIMBER TOWN

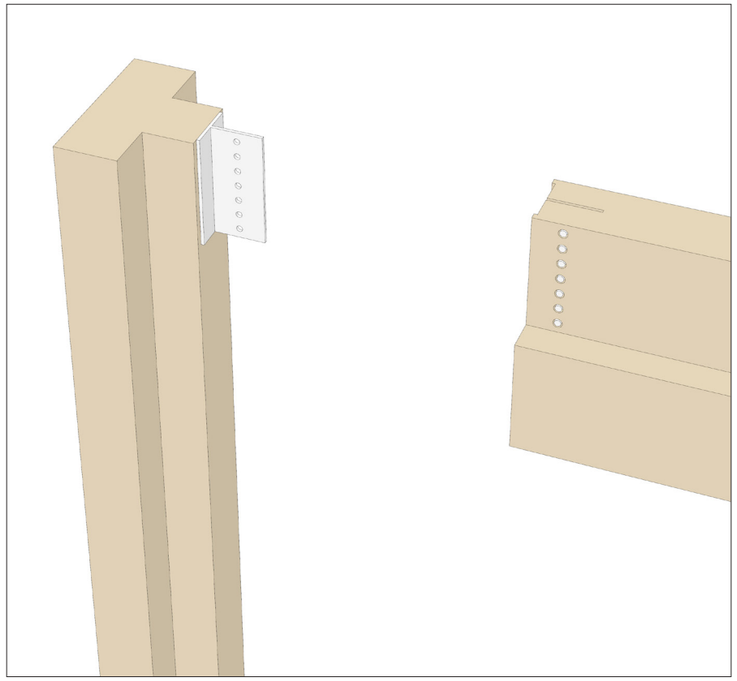
30-04-2020

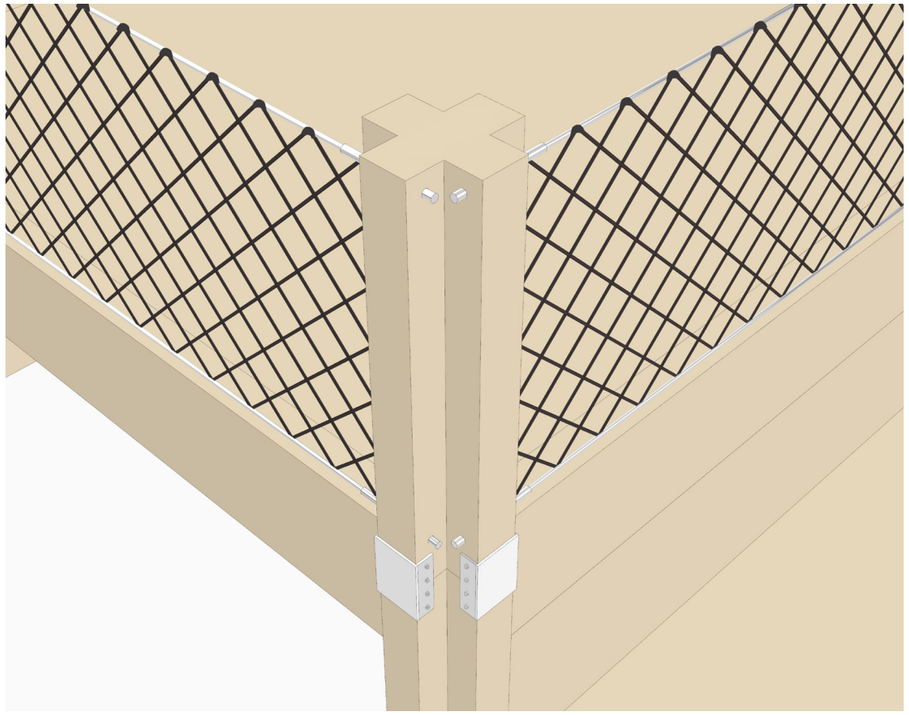
ARCHITECTURE - STRUCTURE





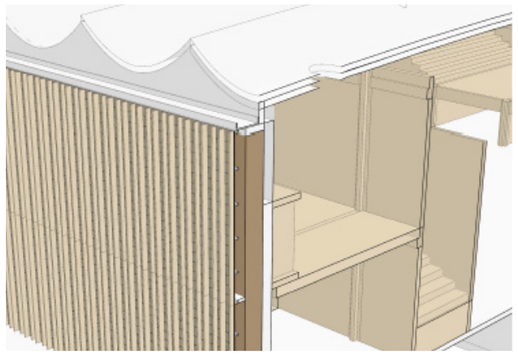






PLANNING

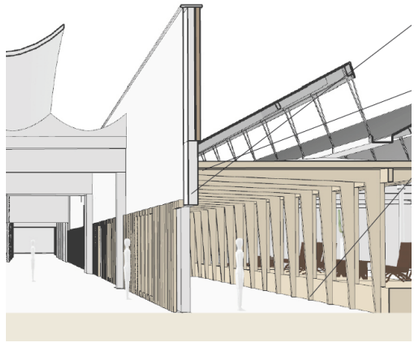
24-04 / 29-04



- 1:20 / 1:5 (garage door + rainwater drainage)

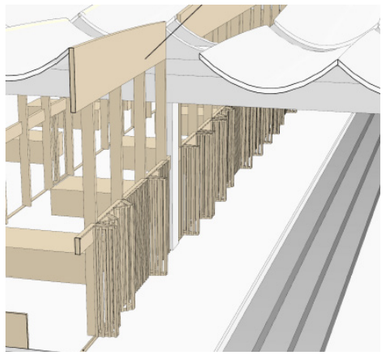
- View on façade
- Vertical cut over door
- Horizontal cut over rainwater drainage

- View on façade
- Vertical cut over insulation
- Horizontal cut over bare bricks and insulation



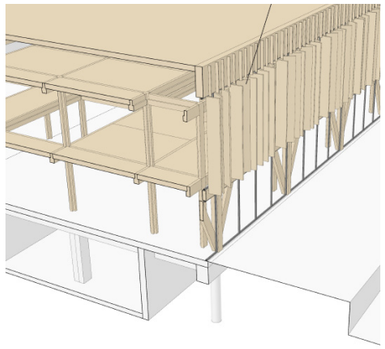
- 1:50

- Show connections (bolts)



- 1:20 / 1:5 (connection panels)

- View on façade
- Vertical cut over panel
- Horizontal cut over panel



- 1:20 / 1:5 (connection panels)

- View on façade
- Vertical cut over panel
- Horizontal cut over panel

- Detail rooflight 1:5

- Detail panel rooflight 1:5

- Detail corner 1:5

BUILDING TECHNOLOGY - VENTILATION

OPTION 0 - SUPPLY BY GRILLS IN FLOOR / EXHAUST BY SMALL ELEMENTS
>> This is not desirable for a workshop function, since the grills can get blocked by the dust

OPTION 1 - SUPPLY UNDER CEILING / EXHAUST BY SMALL ELEMENTS

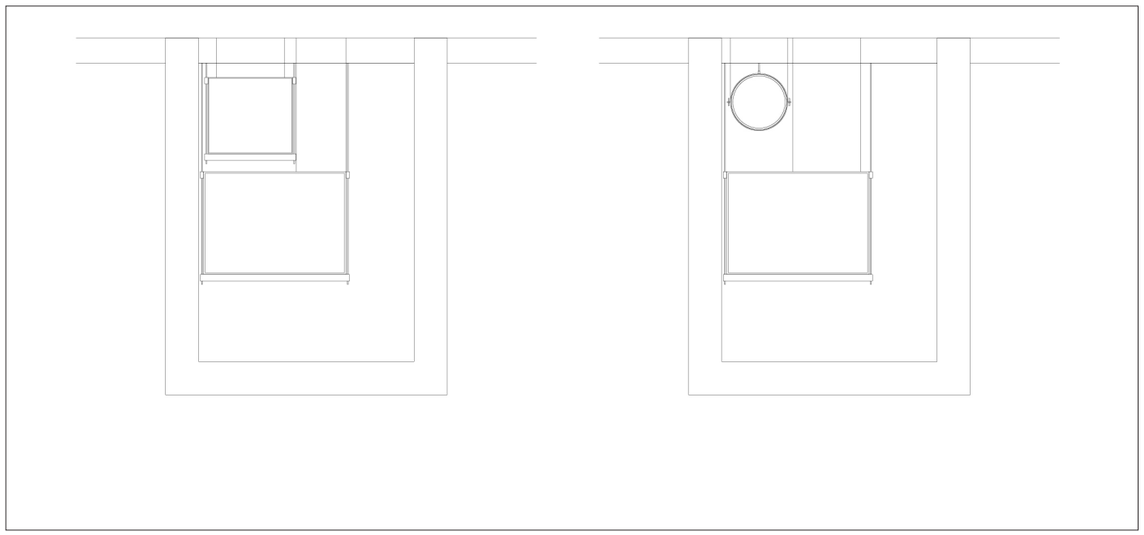
OPTION 2 - SUPPLY BY BIG ELEMENTS / EXHAUST BY SMALL ELEMENTS

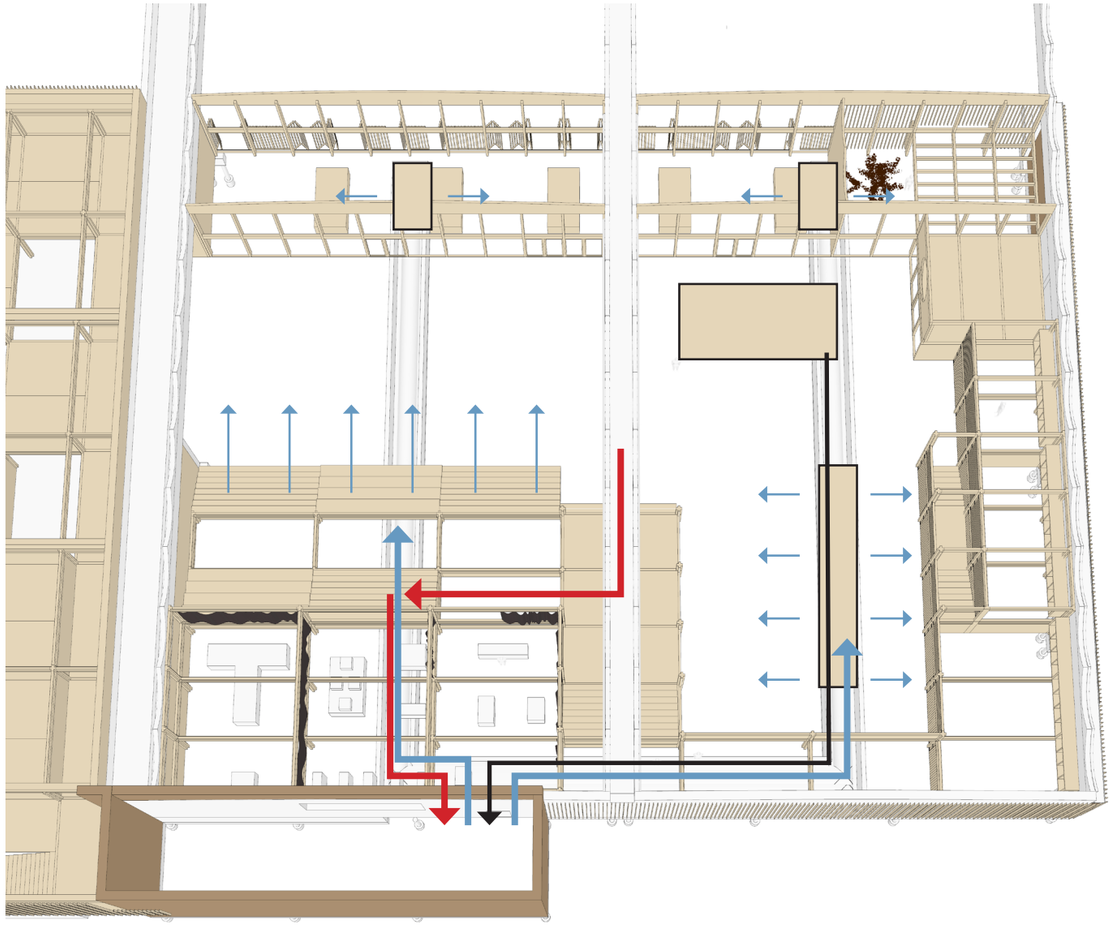
OPTION 3 - SUPPLY BY SMALL ELEMENTS / EXHAUST BY BIG ELEMENTS

OPTION 4 - SUPPLY BY SMALL ELEMENTS AND BIG ELEMENTS / EXHAUST BY BIG ELEMENTS

Recht luchtkanaal 500 mm x 450 mm L=1500 mm

Recht luchtkanaal 800 mm x 600 mm L=1500 mm





BUILDING TECHNOLOGY - DETAILS

CLADDING OPTIONS AND INFORMATION

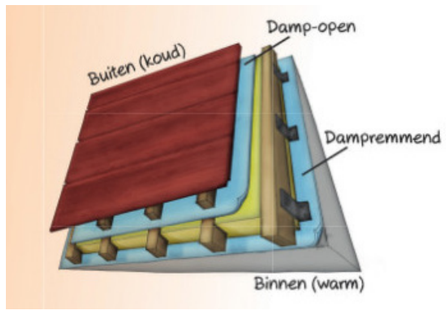
- Type of installation: Sculptform clips

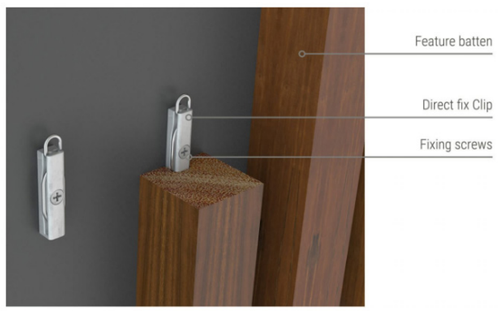
    - invisible cladding attachment system for the façade battens

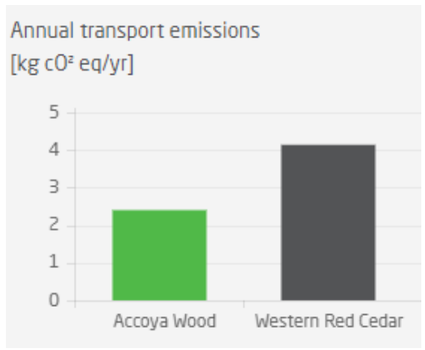
- Type of wood for cladding: Accoya

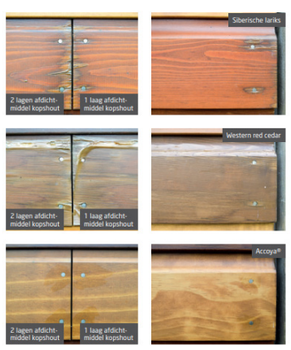
    - Acetylated timber for cladding (treatment with very strong vinegar)
    - When not treated, the façade will colour from light yellow-brown to a more greyish colour
    - End grain wood needs to be coated every 15 years. This is way more sustainable then other wood products
    - Dutch product with timber from New Zealand
    - Only type of wood with a C2C Gold certificate

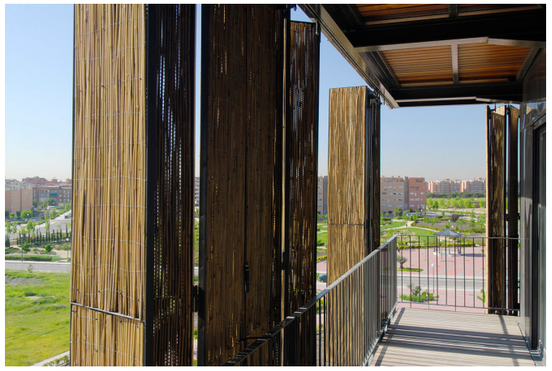
- Acoustic glass: Thermobel Stratophone, reduction up to 40dB. The glass contains a special foil to keep out noise. This glass is also very safe and great thermal insulation.

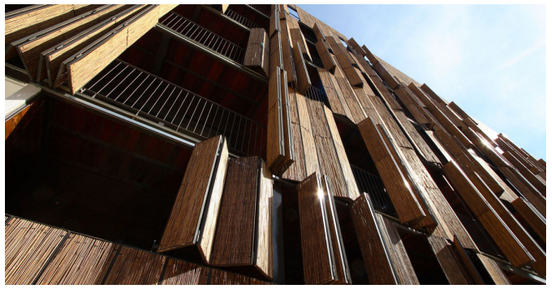


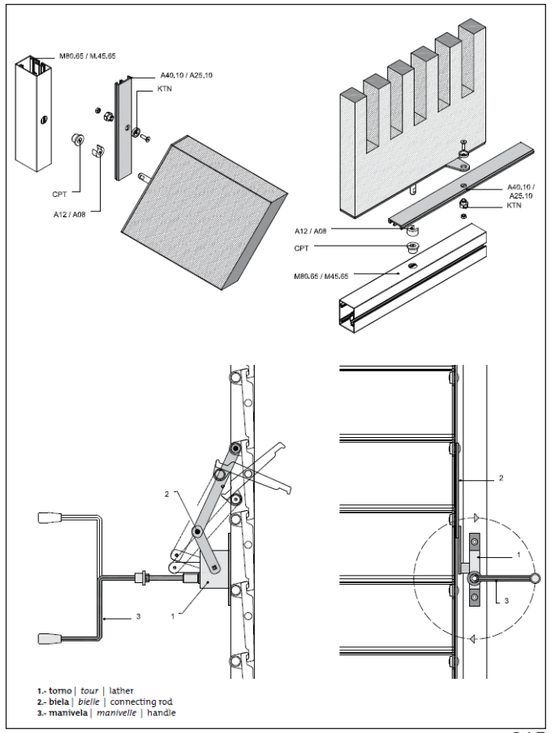






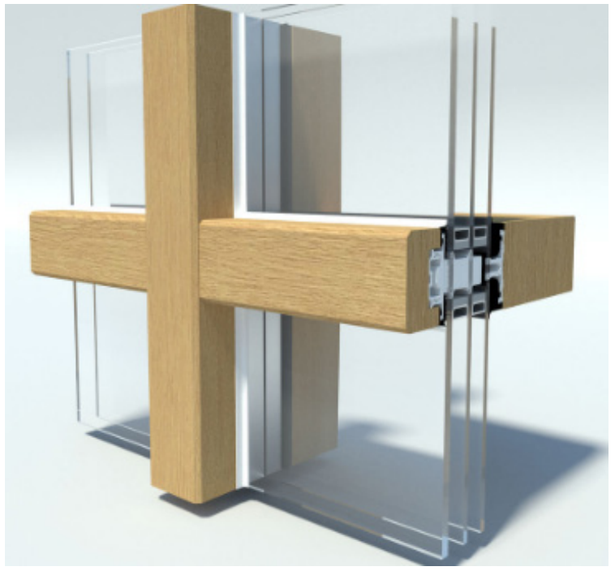




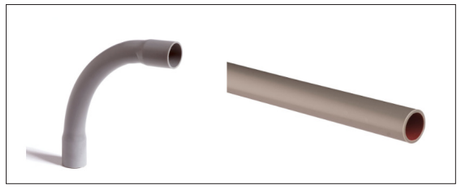


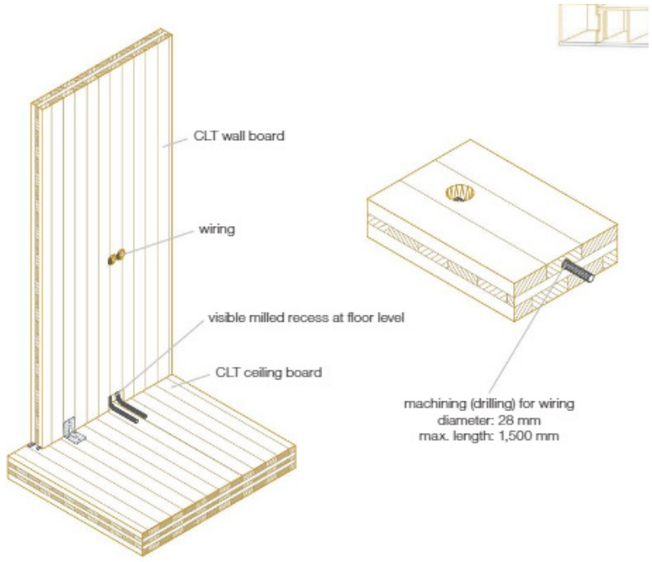
BUILDING TECHNOLOGY - INSTALLATIONS

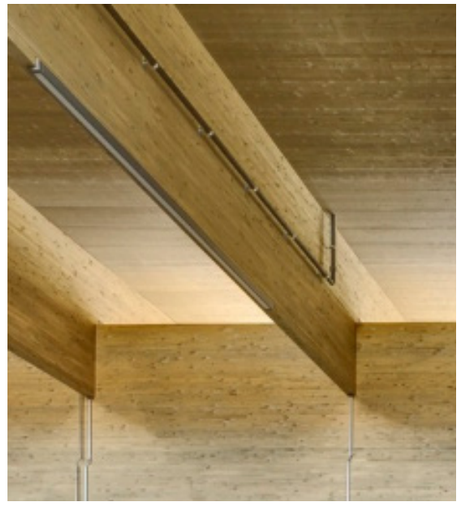
GLASS FAÇADE DETAILLING

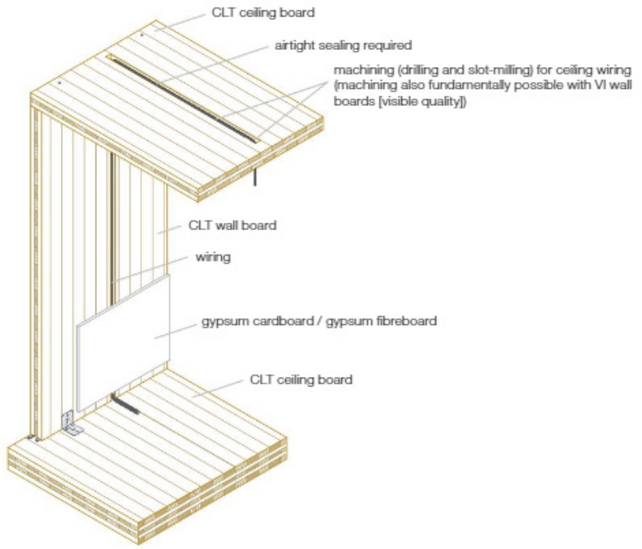


ELECTRICITY



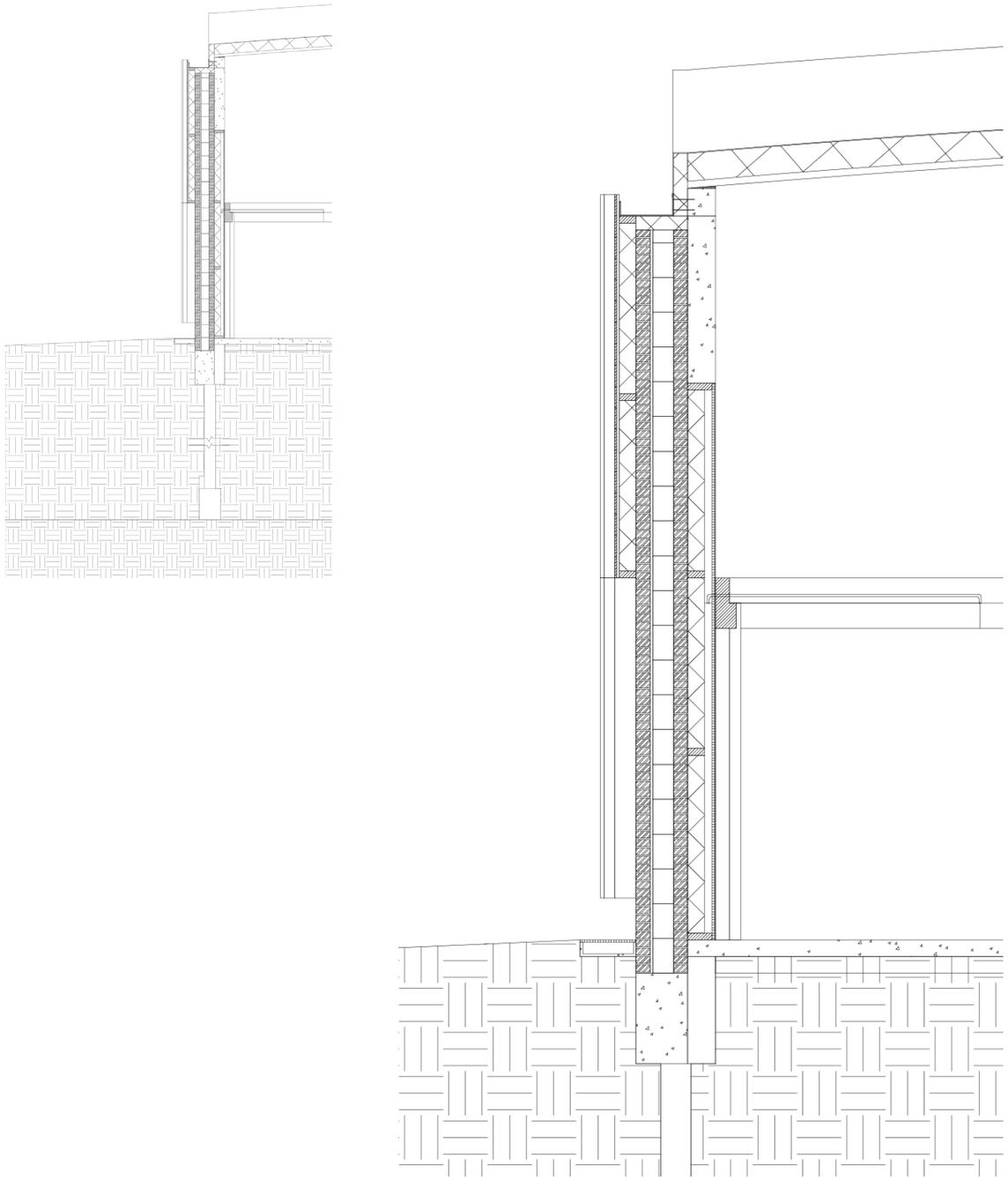




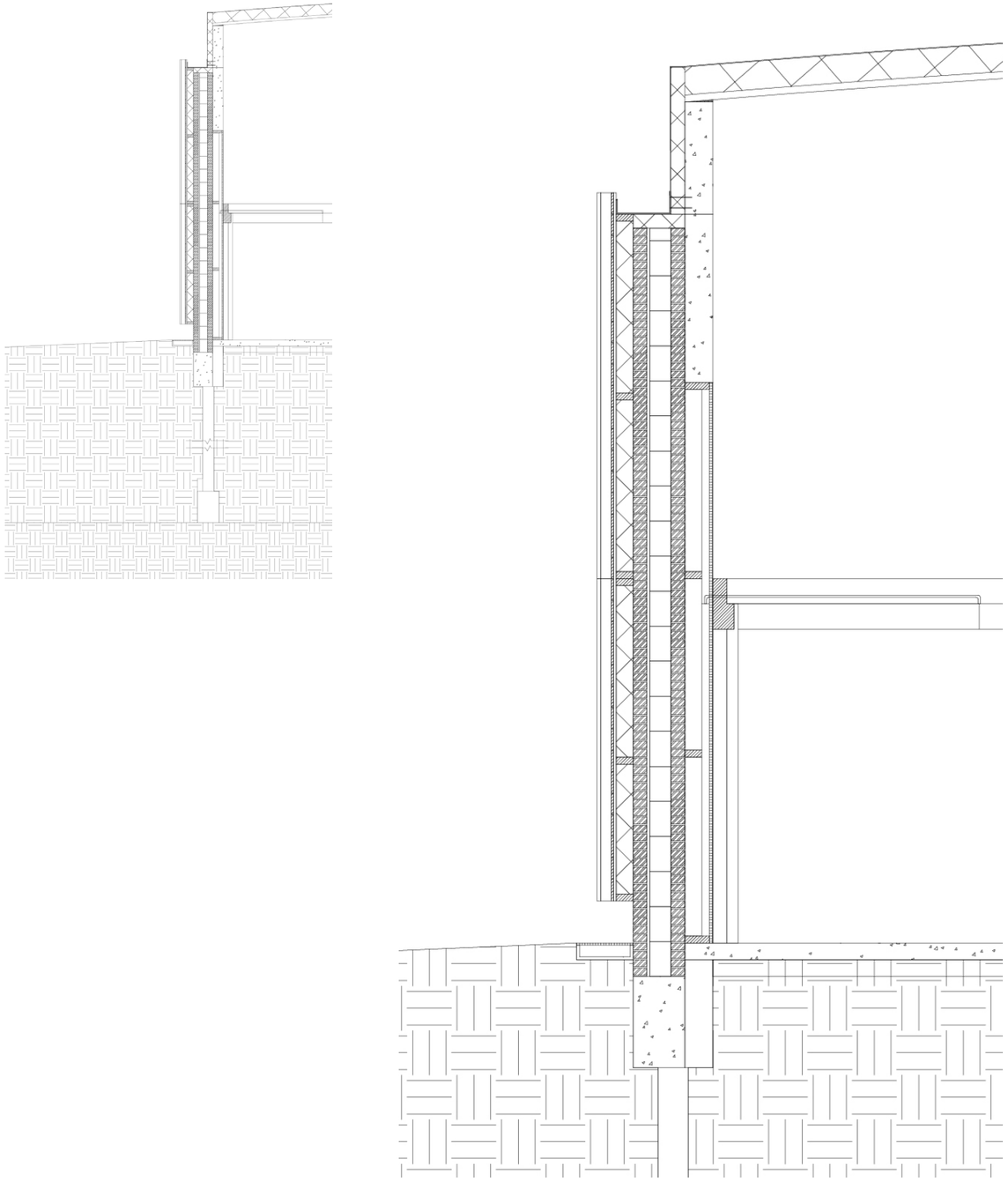


BUILDING TECHNOLOGY - DETAILS

DETAIL A.1: WORKSHOP - EAST FAÇADE

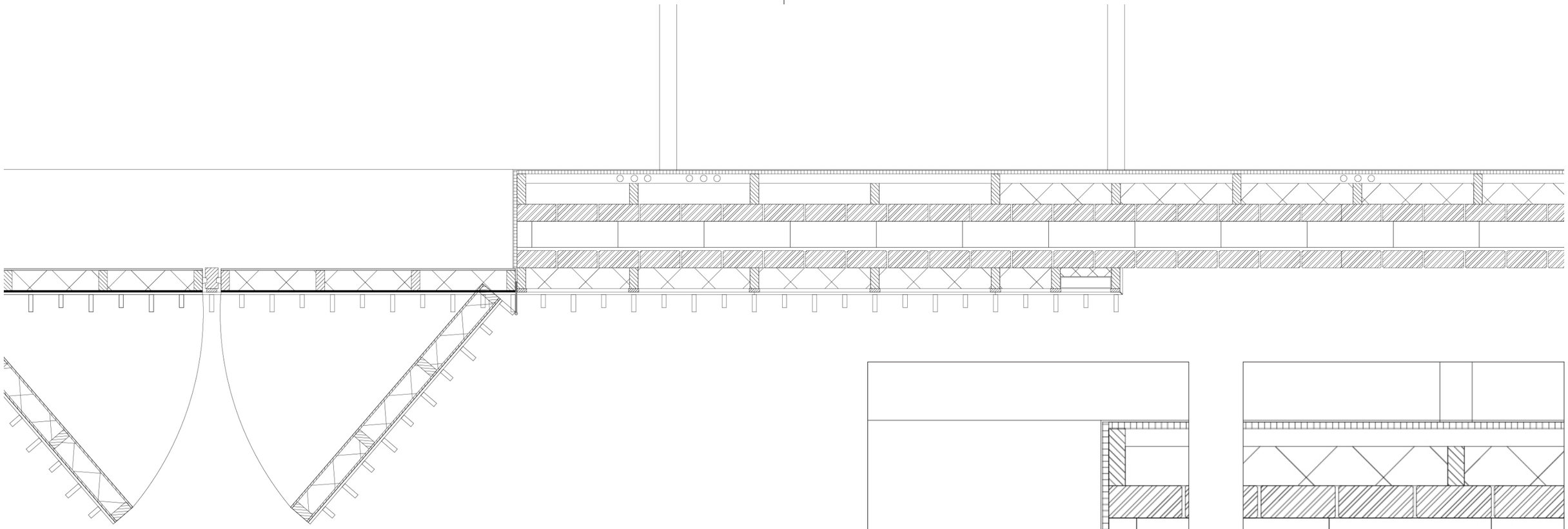


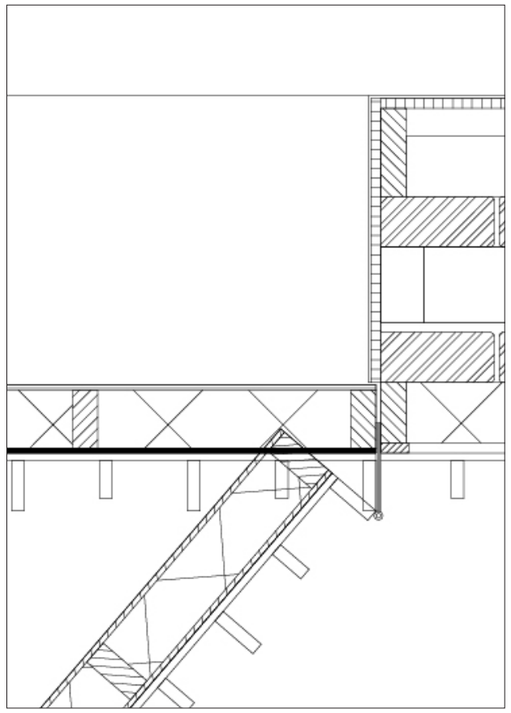
DETAIL A.2: WORKSHOP - EAST FAÇADE

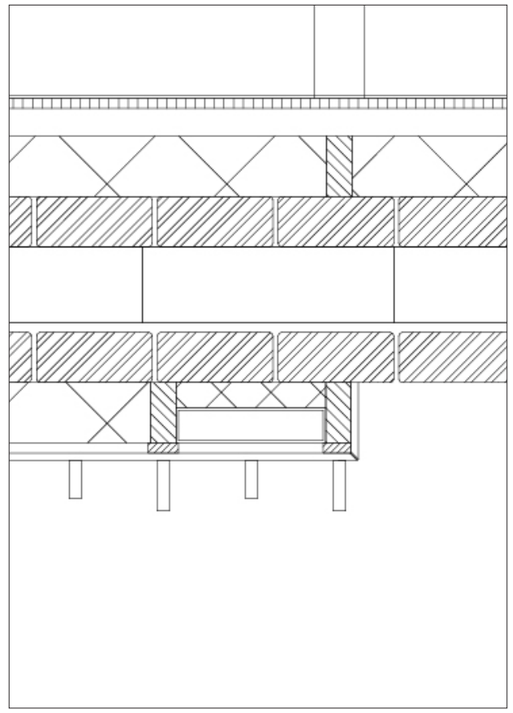


BUILDING TECHNOLOGY - DETAILS

DETAIL A.3: WORKSHOP - EAST FAÇADE

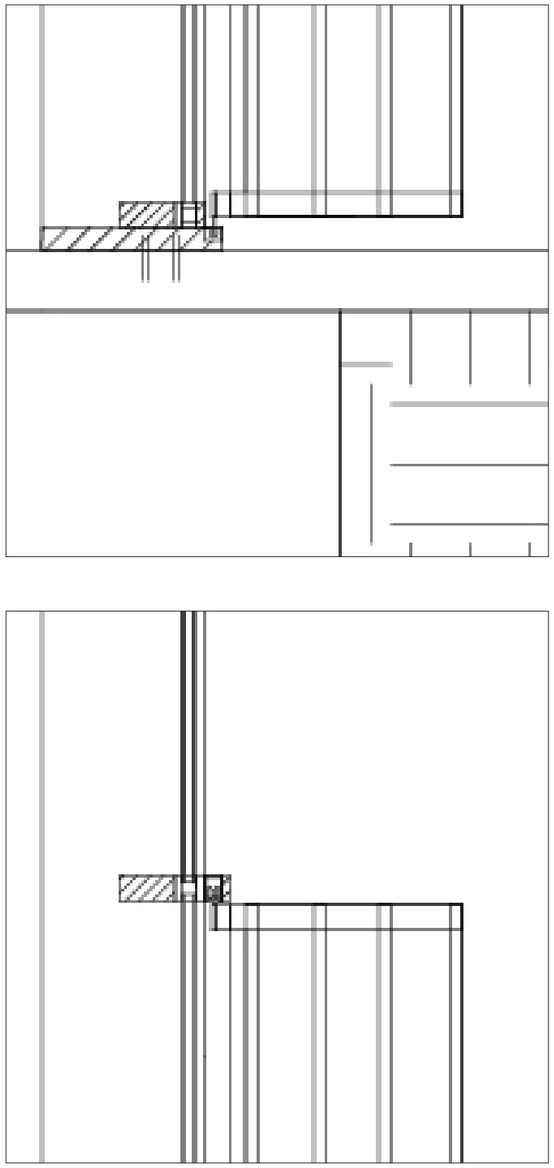


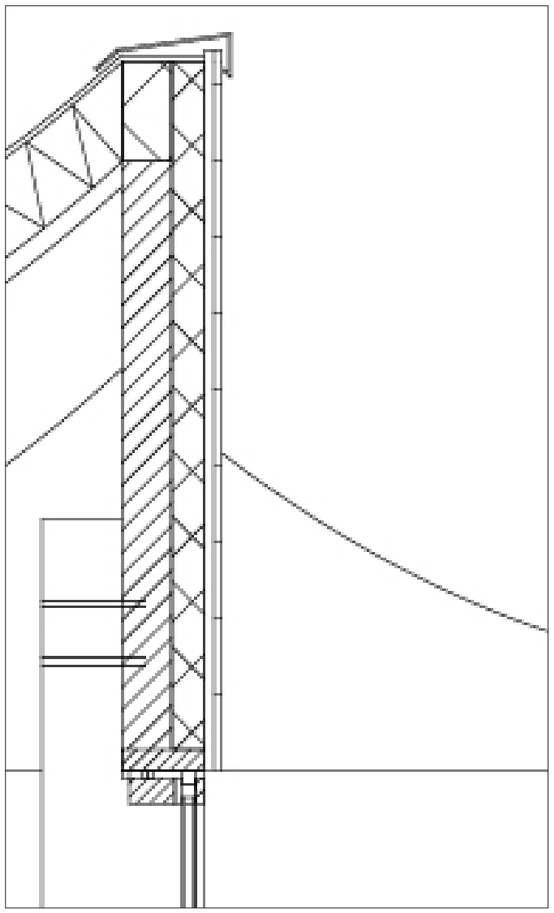


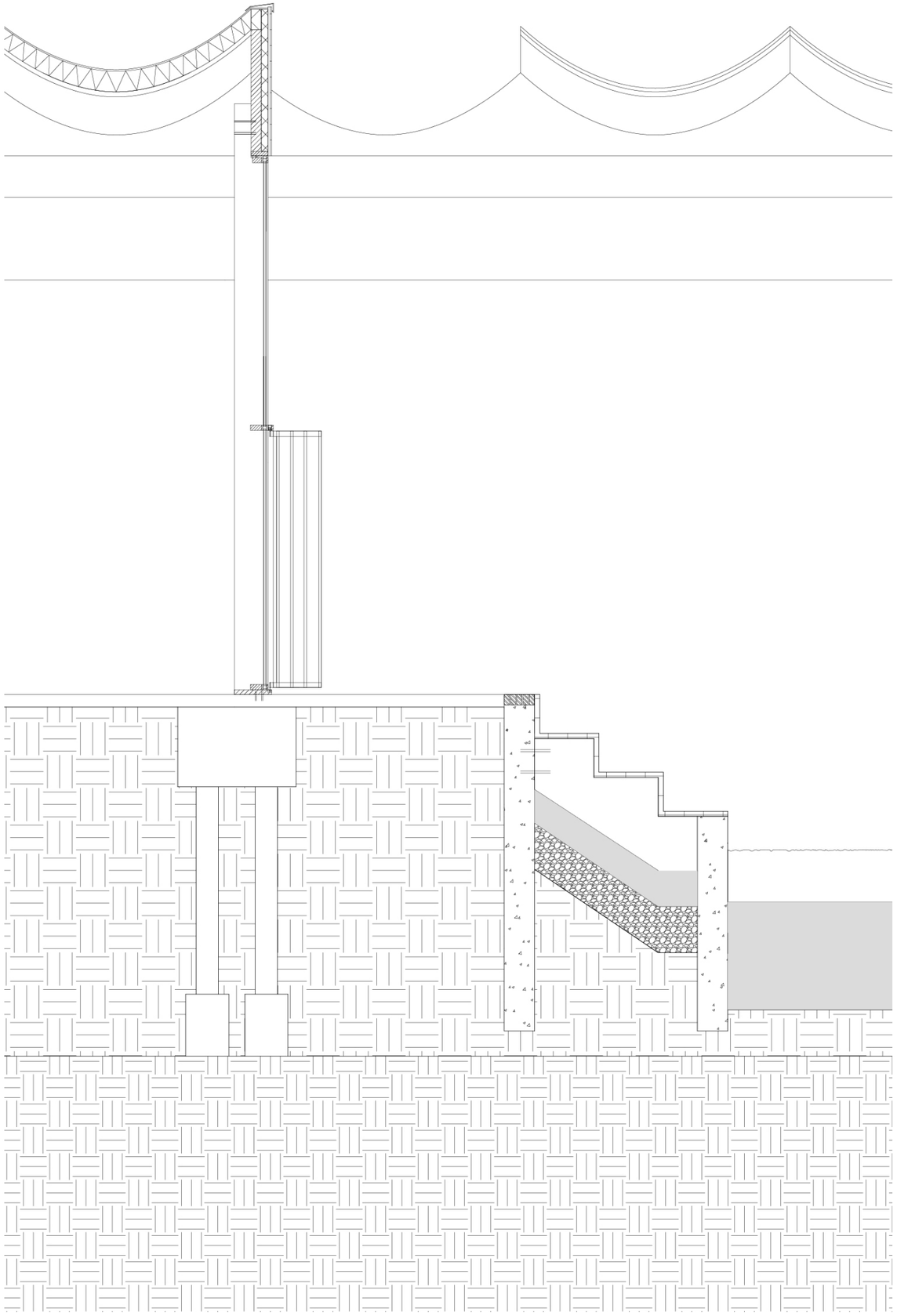


BUILDING TECHNOLOGY - DETAILS

DETAIL B: WORKSHOP - NORTH FAÇADE

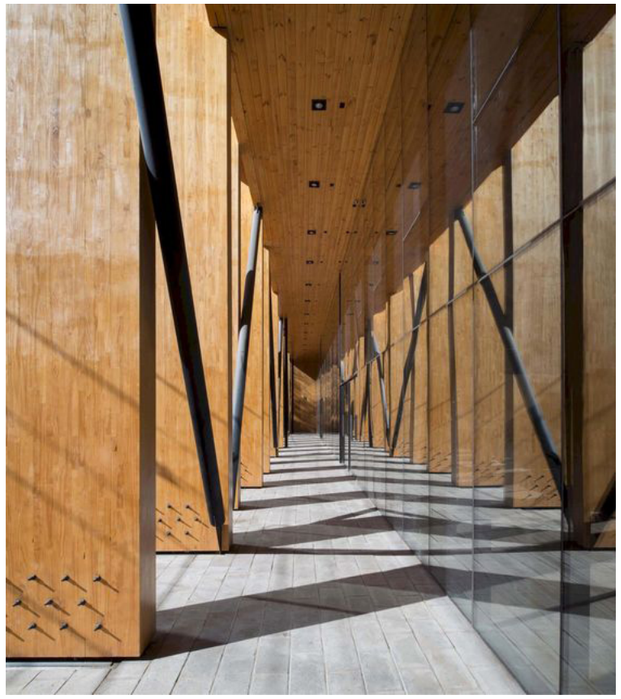


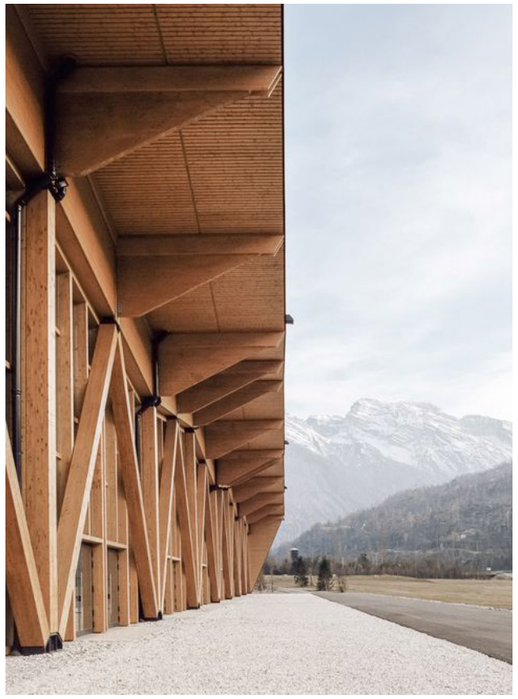




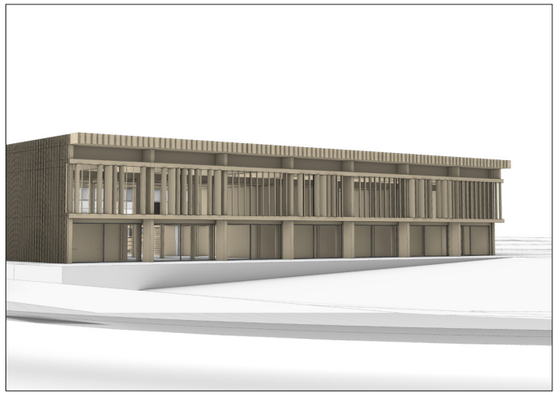
ARCHITECTURE

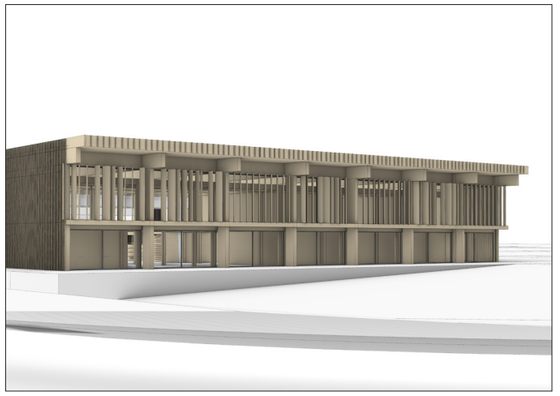
PRECEDENTS





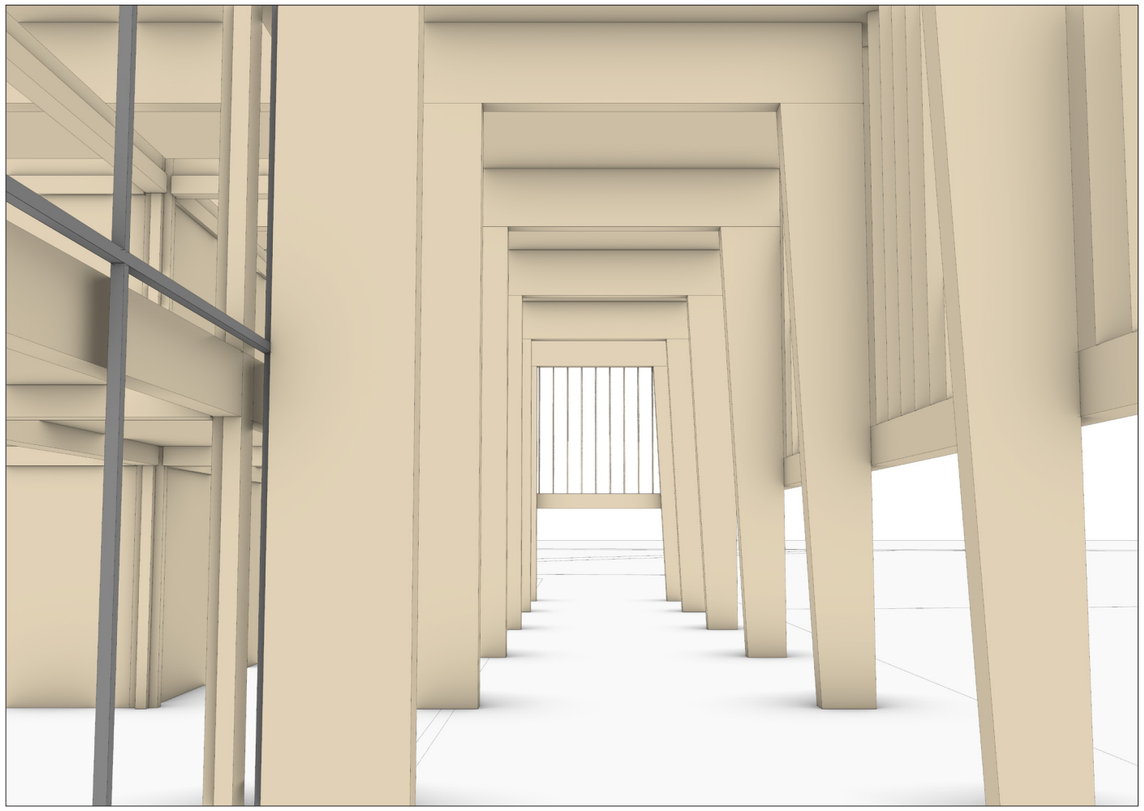
FAÇADE CREATIVE SPACE OPTIONS

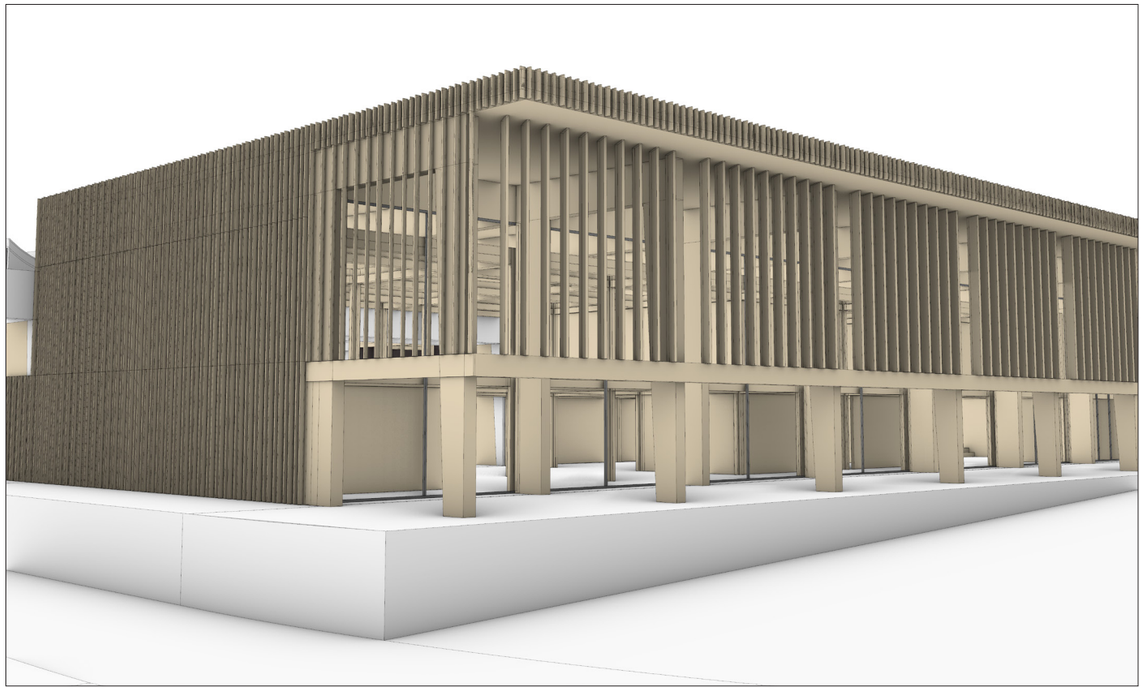


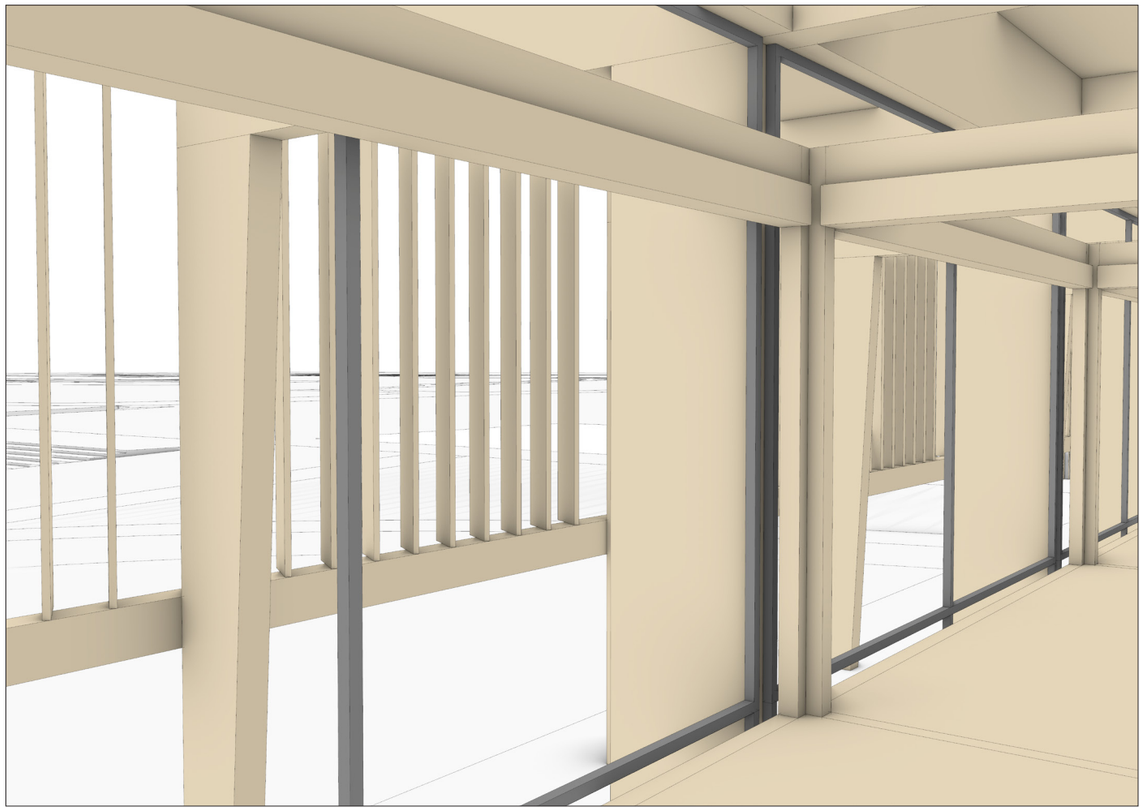


ARCHITECTURE

FAÇADE CREATIVE SPACE





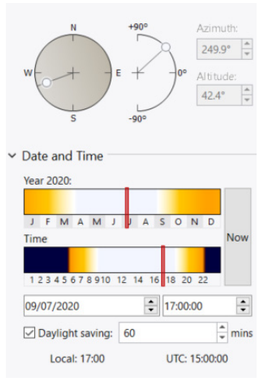


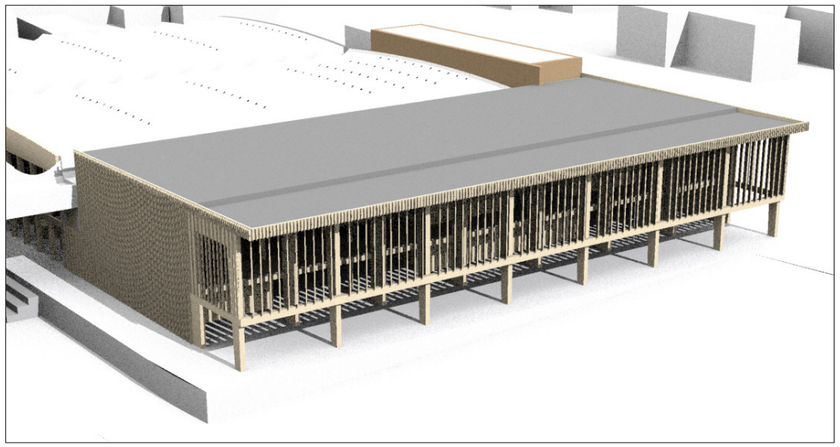
ARCHITECTURE

FAÇADE, CORNERS, MATERIALS, ADJACENT BUILDINGS

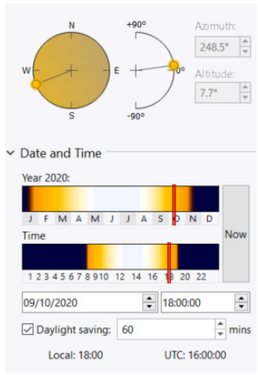
BUILDING TECHNOLOGY - LIGHT

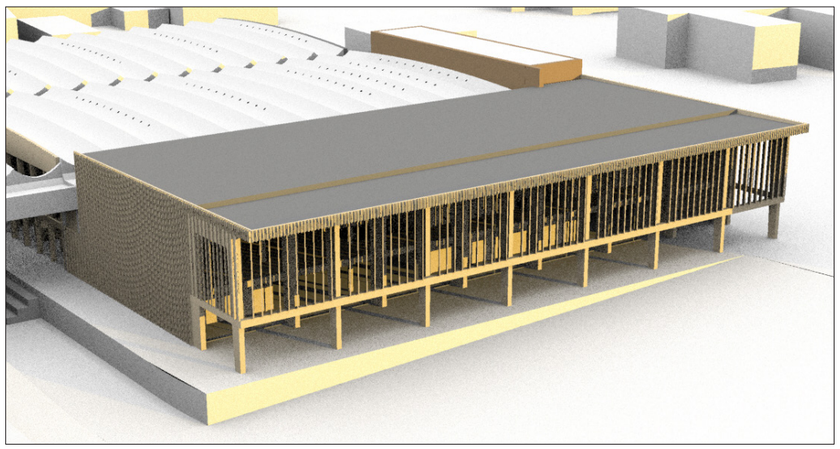
9 JULY 18.00



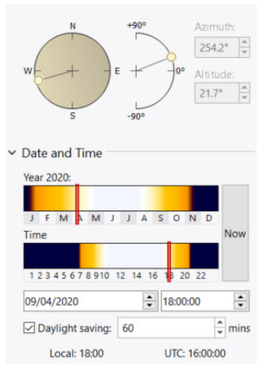


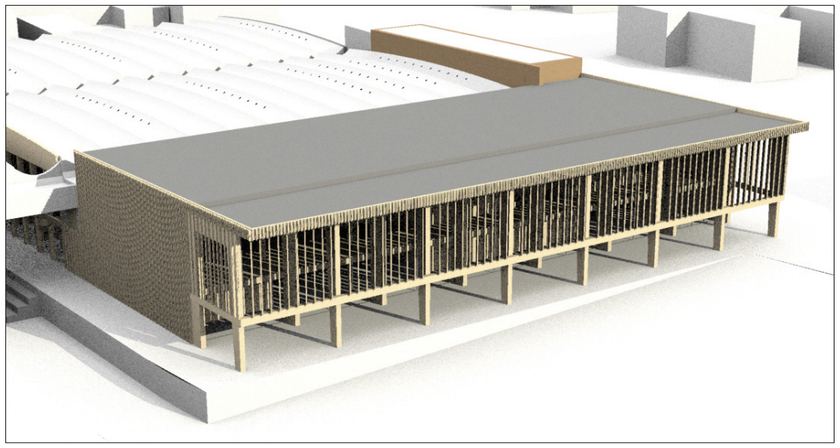
9 OCTOBER 18.00





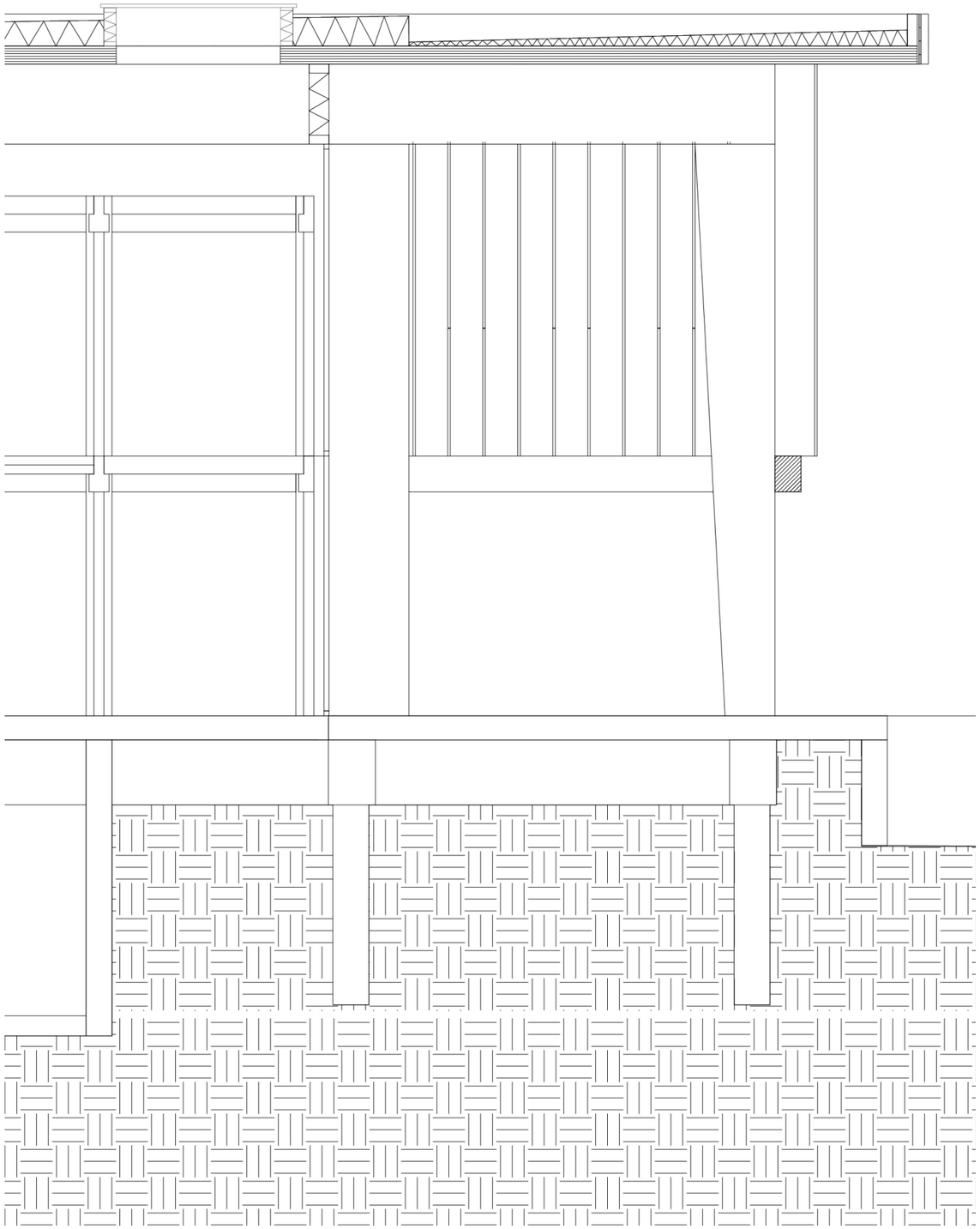
9 APRIL 18.00





BUILDING TECHNOLOGY - DETAILS

DETAIL C: CREATIVE SPACE / CUBICLES - WEST FAÇADE



SUSTAINABILITY

WHEMERBEEK

Information on the Whemerbeek:

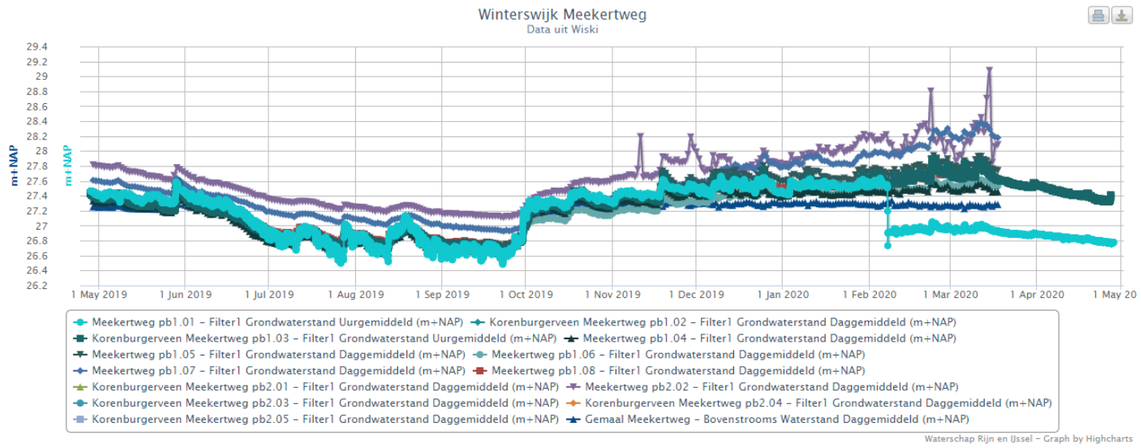
- Management of surface water is the responsibility of the 'Waterschap'. In the inner city, this is done together with the municipality.
- Waterschap: Rijn en Ijssel. Divisons in area of stream --> Groenlose Slinge --> System Berkel

Current/Future situation:
--> Long hot periods: too dry
--> Short peak wet moment: too much water at a certain moment

Because of the warm summers nowadays, dryness is a big problem during the summer months of the year. Also during the other months of the year, not enough water is collected to buffer the problem of the summer.
Also too much of the water is quickly drained by surface water which flows to the rivers and ultimately the sea, instead of being kept en slowly released. Or the water touches the stoney environment and is transported to the sewing system.

Measure are taken in Winterswijk to solve this problem, in the first place by opening up creeks and making them meander to create more surface.

- https://www.achterhoeknieuwswinterswijk.nl/nieuws/algemeen/273780/droogte-en-verdroging-in-de-natuur-
- Structuurvisie Kom Winterswijk 2020-2020



Laan van Hilbelink	Herontwikkeling naar ruimte voor woon-werkeenheden	• Transformatie naar combinaties wonen en werken en publieksgerichte functies • Ruimte creëren voor de Whemerbeek • Ruimtelijke accenten, gebouwelijke oriëntatie richting de beek

Een andere belangrijke kans ligt er langs de Whemerbeek. In de huidige situatie vormt het beekdal vanuit de noordzijde van Winterswijk al een recreatieve entree, die eindigt bij Scholtenbrug aan de rand van het centrum. Ook vanuit de zuidelijke kant kan het deze functie bij uitvoering van het herontwikkelingsplan Whemerbeek en de herstructurering van de Laan van Hilbelink (zie paragraaf 4.5.) krijgen.

georiënteerd zijn. Aan de zuidzijde bestaat een kans de beek zichtbaar te maken als het bedrijventerrein Laan Van Hilbelink wordt geherstructureerd. Bij een herstructurering zal stedelijke bebouwing zich richten op de beekzone, deze kijkt uit over het groen. Bij deze herstructurering is het behoud van karakteristieke bedrijfsgebouwen gewenst en is een enigszins stedelijk beeld voorstelbaar.

In de parkzone worden vooral kansen gezien voor woningen voor ouders en starters gezien de ligging nabij het centrum en de bijzondere historische gebouwen die zich lenen om te transformeren in appartementen.

Daarnaast worden langzaam verkeerroutes aangelegd, die zoveel mogelijk aansluiten bij natuurlijke en cultuurhistorische kenmerken. De huidige route over het oude spoortracé Winterswijk – Bocholt is daarvan een goed voorbeeld. Binnen de spoorzone kan deze route worden doorgetrokken binnen de kern. Een tweede voorbeeld is een route langs de Whemerbeek, waarvoor door de herstructurering van het bedrijventerrein Laan van Hilbelink ruimte kan worden gecreëerd. Oude zandwegen worden behouden en lopen op een aantal plaatsen tot in de kern.

Beleidsuitgangspunten:

1. Ingezet wordt op het vormgeven en inrichten van natuurlijke groene dragers in de kern. Het betreft het inrichten van een zone rondom de Whemerbeek;

Verbetering van deze randen is gewenst.

9. De beek bereikt de stad; zowel aan de noord als zuidzijde van het centrum is voelbaar dat de beek de stad bereikt. Stedelijke silhouetten van bebouwing bepalen hier het beeld. Zo is bij het Scholtenbrugpark het silhouet van de oude stad zichtbaar en kijkt de oude stad als het ware uit over het groen. Langs de rand van de stad loopt een pad en is het park toegankelijk. Het is gewenst dat woningen ook echt aan het park liggen, hierop georiënteerd zijn. Aan de zuidzijde bestaat een kans de beek zichtbaar te maken als het bedrijventerrein Laan Van Hilbelink wordt geherstructureerd. Bij een herstructurering zal stedelijke bebouwing zich richten op de beekzone, deze kijkt uit over het groen. Bij deze herstructurering is het behoud van karakteristieke bedrijfsgebouwen gewenst en is een enigszins stedelijk beeld voorstelbaar.
10. De beek in de stad; Momenteel verdwijnt de beek bij de Dingstraat en het Scholtenbrugpark onder de grond. In het centrum van Winterswijk wil de gemeente het water op een stedelijke wijze zichtbaar maken. Het vergroot daarmee de ruimtelijke kwaliteit en identiteit van het centrum.

4.4. De Whemerbeek

De Whemerbeek is in meerdere opzichten een gebied dat de volle aandacht nodig heeft. De beekzone bepaalt mede de identiteit van Winterswijk en verbindt stad en land met elkaar. Daarnaast is het als uitloopgebied van belang voor de wijken die aan de Whemerbeek grenzen. Tot slot heeft de Whemerbeek (ondanks dat deze niet is aangewezen als ecologische verbindingszone) een ecologische waarde die veiliggesteld moet worden.

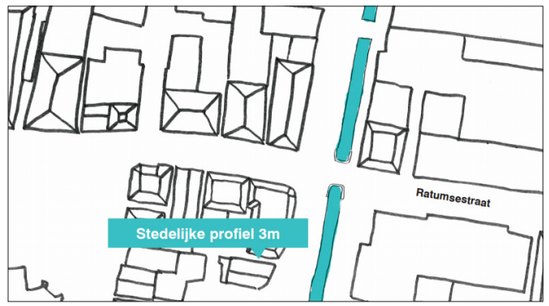
In de hele beekzone zien we globaal 3 karakteristieken:

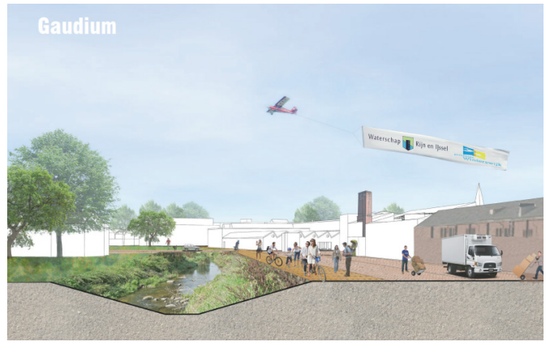
8. De landelijke beek; Het grootste deel van de beek in Winterswijk heeft een landelijk parkachtig karakter. De bebouwing van de wijken rondom ligt met groene randen naar de beekzone wat het groene karakter – het gevoel van buiten zijn – versterkt. Momenteel zijn sommige randen onverzorgd.

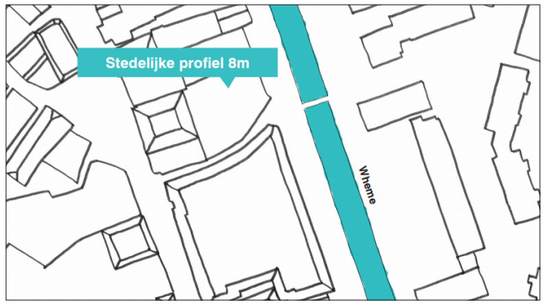
Foto's: (1) de Whemerbeek (2) een stedelijke loop van een beek in Apeldoorn (3) de loop van de Roombeek in Enschede.

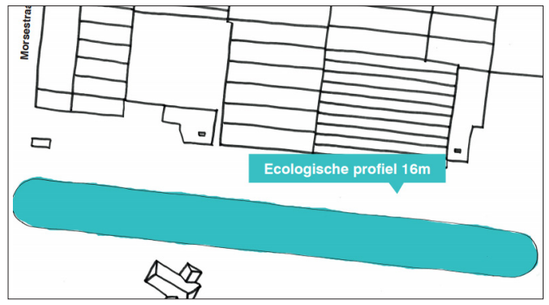
SUSTAINABILITY

WHEMERBEEK AND VISION MUNICIPALITY WINTERSWIJK

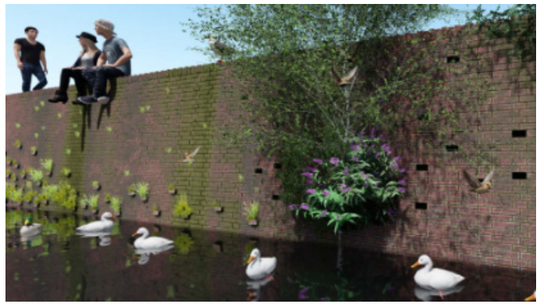








WHEMERBEEK AND PUBLIC SPACE DESIGN



https://www.tudelft.nl/en/2020/bk/regenerating-urban-rivers-with-green-quays/?utm_medium=email

TIMBER TOWN

07-05-2020

TIMBER

Vergrijzen

Western red cedar, Californian redwood en diverse duurzame loofhoutsoorten (klasse 1 of 2) zijn geschikt voor gevels die men wil laten vergrijzen. Tijdens dat proces ontstaan kleurverschil en lichte scheurvorming aan het oppervlak. Gebruik in dit geval bij voorkeur hout met een minimumdikte van 19 mm.

Voor een gelijkmatige vergrijzing is het noodzakelijk dat de gevel gelijkmatig en voldoende aan weer en wind blootstaat. Dakoverstekken en dergelijke beschermen afgewerkt hout goed, maar zijn dus af te raden bij een gevelbekleding die men wil laten vergrijzen. De ervaring leert dat dit in een boomrijke omgeving en op de noordzijde van gebouwen zelden mooi verloopt. Ook verduurzaamd en gemodificeerd hout kunnen onbehandeld blijven.

Hoewel lariks wel eens onafgewerkt wordt toegepast, adviseert Centrum Hout lariks minimaal rondom te voorzien van een semi-transparante beits.

By significantly enhancing the durability and dimensional stability of fast-growing, abundantly available certified sustainable wood species, Accoya® provides compelling environmental advantages over scarce slow growing hardwoods, woods treated with toxic chemicals, and non-renewable carbon-intensive materials such as plastics, steel and concrete.

The sustainability of wood varies, but the certifications that Accoya® has been awarded provides assurance that our product is truly sustainable. In the USA and UK both our FSC® and Cradle to Cradle™ Gold certifications (EPA Recommended Private Sector Standards/Ecolabels) demonstrate our exceptional environmental credentials. You can review all our certifications here.

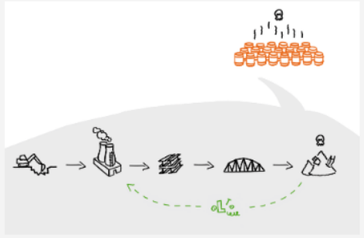
As a result of increasing global population and consumption, and a linear 'make-take-waste economy', our planet is overexploited resulting in depletion of the world natural resources, a huge waste problem, toxic emissions and ultimately global warming.

Against this backdrop it seems unimaginable to keep mass consuming carbon intensive materials from non-renewable resources such as plastics, concrete and metals when there are alternatives (sustainable woods) freely available. Although there are various initiatives within the concept of the circular economy that emphasize closing the loop of the so-called technical cycle for non renewable materials, in reality, this is more an exception to the rule than current practice, see also the Sustainability Comparison.

Essentially, sustainable building materials produced in the biosphere (bio-cycle of the circular economy) have three huge 'green' benefits over techno-cycle materials:

- They are renewable (if managed well; an unlimited source of resource)
- They have a very low, possibly even negative carbon footprint
- If designed well (bio-cycle compliant additives, coatings & adhesives), they are biodegradable, returning back into the bio-cycle becoming nutrients for new plants/trees.

Based on these three criterion wood sustainability has huge benefits over other materials.



LINEAR ECONOMY BASED ON NON-RENEWABLE MATERIALS

BIOBASED ECONOMY FROM RENEWABLE MATERIALS

However, often techno-cycle materials are preferred over bio-cycle materials because of their superior technical performance. With Accoya® there is now a fully bio-cycle compliant sustainable wood, including the associated green benefits – that matches the technical performance of techno-cycle materials.

Accoya® - C2C Gold and C2C Platinum (Material Health) certified!

Cradle to Cradle (C2C) is a design philosophy developed by Michael Braungart and William McDonough inspired by the circular economy concept. Since 2005 the Cradle to Cradle Certified™ product standard was developed and has been highly adopted in Western markets as being the most stringent product certification fitting with the incentives of the circular economy.

Through the certification process the C2C product standard steers designers and manufacturers through a continuous environmental and social improvement process in which the product is assessed in five categories; material health, material recycling, renewable energy and carbon management, water management and social responsibility.

Accsys Group's acetylation process that is used to manufacture Accoya®, fits perfectly in the bio-cycle of the C2C concept. Through the acetylation process, the part of wood that readily bonds with water is replaced by acetyl groups which are naturally occurring especially in the more durable wood species. Thus, the acetylation process mimics nature, and without adding any toxic substances, it ensures performance and material health to the highest level possible under C2C standards: the platinum level for which it has received a separate award.

Also at end-of-use, Accoya® provides no challenges whatsoever. It can be treated similar to untreated wood and thus can be re- or upcycled in various ways. Therefore it comes as no surprise that Accoya® has been certified at the C2C Gold level since 2010, as the only structural building material around.

Cradle to Cradle certified product scorecard for Accoya®

Material Health	Platinum
Material Reutilisation	Gold
Renewable Energy & Carbon Management	Gold
Water Stewardship	Gold
Social Fairness	Gold
Overall Certification Level	Gold

It is for these reasons that Accoya® is prescribed in many C2C inspired projects such as the new C2C office of the Municipality of Venlo, Early childhood center in Wassenaar by the famous Dutch architectural firm Kraaijvanger, and the first C2C inspired business park 2020 in Hoofddorp by Delta Development. Furthermore, Accsys Group is actively supporting the Built Positive movement initiated by the C2C Product Innovation Institute, to further promote the adoption of C2C design principles in the Built Environment.

Additional credits for Green Building Certification

A large benefit of C2C certification is that, especially at the higher certification levels (Gold & Platinum) it contributes to several credits in recognized Green Building Schemes such as LEED and BREEAM.

Since 2015 a new breakthrough occurred when Google adopted C2C Material health as one of the compliant certification schemes within Portico, Google's Healthy Materials Program tool.

As Accoya® sustainable wood received C2C Material Health certification at the highest, Platinum, level it is now amongst the most highly rated products in Google's Portico, earning 15 out of 16 points. This highlights Accoya® as an optimised product with a product status that exceeds criteria for any Google construction project throughout the globe.

accoya® www.accoya.com

Datablad

Materiaal
100% puur Accoya® hout

Duurzaamheid
Accoya® hout voldoet altijd aan de eisen voor duurzaamheidsklasse 1 (de hoogste klasse) in de gebruiksklasse 1 t/m 4 conform EN 350-1 & EN 335-1.

Evenwichtsvochtgehalte
3 - 5% bij 65% relatieve luchtvochtigheid, 20°C

Dichtheid en marges
65% RV, 20°C
Gemiddeld 512 kg/m³, bereik 432 tot 592 kg/m³

Krimpgedrag

Nat - 65% RV, 20°C	Nat - Ovendroog
Radiaal 0,4%	Radiaal 0,7%
Tangentiaal 0,8%	Tangentiaal 1,5%

Buigsterkte
39 N/mm² conform EN 408

Buigstijfheid
8790 N/mm² conform EN 408

Warmtegeleidingsvermogen
0,12 W(m.K) conform EN 12667

Janka hardheid
Langs 4100 N, Kops 6600 N conform ASTM D143

Brandwerendheid
De brandklasse van Accoya® hout is vergelijkbaar met naaldhoutsoorten zoals vuren en grenen. Een hogere brandklasse kan verkregen worden met brandvertragende behandelingen.

Bewerkbaarheid
Het verwerken van Accoya® hout tast de unieke eigenschappen niet aan omdat het door en door gemodificeerd is en niet uitspoelbaar. Het is relatief gemakkelijk te bewerken en kan vergeleken worden met het profileren van zachte houtsoorten. Er zijn geen bijzondere gereedschappen vereist.

Verlijmen
Omdat Accoya® hout droger is dan ander hout en water op andere wijze opneemt kan het nodig zijn om de wijze van verlijmen aan te passen. Accoya® hout is goed te verlijmen met PU, Epoxy en PRF lijmen. Het resultaat van verlijming met PVAc kan sterk variëren. MUF lijmen worden sterk afgeraden.

Afwerken
Accoya® hout kan goed afgewerkt worden met semi-transparante en niet-filmvormende verfsystemen. Diverse op olie gebaseerde producten laten een snellere absorptie zien dan water. Bij het gebruik van filmvormende transparante en dekkende verfsystemen dient men altijd alzijdig af te werken met minimum laagdiktes volgens de normen en/of voorschriften van de verfleverancier. Kopse afdichting met een daarvoor geschikt product en afgestemd op de toepassing. Neem voor advies contact op met uw verfleverancier.

Bevestigingsmiddelen
Het Accoya® hout te allen tijden monteren met RVS bevestigingsmiddelen in kwaliteit A2 of A4 (EN 10088-1) of AISI type 304 of 316. Daarnaast zijn ook speciaal gecoate (epoxy, polyurethaan) bevestigingsmiddelen geschikt. Bij voorkeur schroeven voorboren. Glaslatten en andere kleine afmetingen van Accoya® bevestigen met nieten type 18G in A2 kwaliteit, hetgeen splijten zoveel mogelijk voorkomt.

Vergrijzing
Accoya® hout is natuurlijk en niet giftig, dus kan er verblauwing ontstaan als Accoya® niet gecoat wordt. Vergrijzing kan voorkomen worden door het gebruik van een hoge kwaliteit UV-bestendige coating.

Alle vermelde waarden zijn gemiddelden tenzij anders aangegeven en dienen niet worden gebruikt voor de berekening van constructieve toepassingen. Neemt u voor assistentie en planning van constructieve projecten direct contact op met Accsys Technologies.

accoya® the world's leading high technology wood

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ACCSYS TECHNOLOGIES

TIMBER

ACCOYA® (SPIANATA PINE) TIMBER AND SCOTS PINE TIMBER (SYLVESTRIS)

- Accoya wood comes from the Spianata Pine tree and is used for the façade cladding

- The other type of timber used for the interior comes from the Scots Pine tree and therefore matches the colour of the Accoya

- The façade cladding will be grey coated, giving the façade the opportunity to grey equally. This is needed since some roofs are cantilevering. It is better to take this process into own hands.

- The result is a more grey-yellowish cladding, and the contrast of the more brown-yellowish colour of the interior

STANDARD SIZES ACCOYA AND STUDS AND CROSS-BEAMS

Sizes

48 x 100	62 x 100	74 x 100
48 x 125	62 x 125	74 x 125
48 x 150	62 x 150	74 x 150
48 x 200	62 x 200	74 x 200

Length

4200	4800	6000
Speciale lengtes (3500 tot 7100 mm - minimaal 10 m³)		

Vertical cladding sizes façade (Accoya):
24 x 75 mm and 24 x 100 mm

Horizontal cladding sizes façade (Accoya):
15 x 140 mm

Vertical battens sizes façade (Spruce):
21 x 58 mm

Vertical battens sizes façade (Spruce):
44 x 120 mm

FIRE PROTECTION

- Brick existing façades: The timber façade cladding doesn't have to reach fireclass B, according to the Bouwbesluit (see table).
Pine timber in general is very flamable and only reaches a fireclass of D.

- New CLT structure: Important is to have MUF glue panels. The panels themselves are as fireproof as wood.

- Partition walls: The Accoya timber can be coated by Burnstop/Flame-away® from Fire-Resistant. Pine timber in general is very flamable and only reaches as fireclass of D, but with this coating a fireclass of B can be achieved.

- Interior structure The laminated timber structure of the interior of the buildings should be impregnated with a fire-proof coating.

Gebruiksfunctie	Nieuwbouw (m²)	Bestaande bouw (m²)
Wonen (geen woonwagen)	1000	2000
Bijeenkomst	1000	2000
Cel	1000	2000
Gezondheidszorg	1000	2000
Industrie	2500	3000
Kantoor	1000	2000
Logies	500	1000
Onderwijs	1000	3000

Eisen brandgedrag buitenzijde gevels: • volgens EN 13501-1 (klassen A1, A2, B-F) voor 'nieuwbouw' • Volgens NEN 6065 (klassen 1 t/m 5) voor 'bestaande bouw'	
Geveldeel > 13m	B / 2
Geveldeel < 2,5m, als hoogste vloer >5m *	B / 2
Geveldeel tussen 2 BC's (voorwaarde in NEN 6068)	B / 2
Geveldeel naast vluchtroute: • Extra beschermde vluchtroute • Beschermde vluchtroute (nieuwbouw) • Beschermde route (bestaande bouw) Afwijking voor vluchtroute celfunctie	C / 2 C (slaapfunctie*), D (rest) 2 (woongebouw), 4 (rest) B / 1
Geveldeel rest	D / 4
Afwijking: deur, raam, kozijn e.d.	D / 4

SUSTAINABILITY

WHEMERBEEK - INFORMATION BY KAREL HESSELINK, WATERSCHAP RIJN EN IJSSEL

The Whemerbeek is a creek with a natural stream. Because Winterswijk is situated relatively high, there is a pretty good and fast stream towards the lower situated villages.

Back in the days, the creek used to be a branch of the Boven-Slinge. Becaus of this, water overload was always a problem and Winterswijk floaded regularly. Nowadays a bypass is made towards the Aaltense Slinge.

Because of the creeks' natural flow, the farming culture and the current climate, the creek is fluctuating in height a lot. Whenever there are dry periods (spring/summer) the creek can completely dry out. But in a day it can rise up to 1 meter height.
The dryness in the first place is the result of the farmers, who desire to have very dry land because it is easier to work on. With their drainage systems, the ground is incredibly dry. In this way the ground cannot compensate with the very dry climate and a water shortage is created. The only way to counter this trend is to change our way of farming in the future, a complete change mindset here is needed.

Opening and improving the creek works well on different aspects: a nice perception of the built environment and public space, ecology and climate (cooling). Whenever the creek then falls dry, it is importat to create an attractive green zone without any dirt on top of the soil. Therefore a new layer of sand can be added. Also a deeper sort of 'escape pit' can be dug, where water animals can stay until the water rises again.

It is important to keep the creek clean and to make sure that there are no 'dirty' or difficult corners. Also keep into mind the safety of the creek. Are the quays high? Is it safe for children to play or can they easily fall into the water?

WHEMERBEEK - INFORMATION BY FRANK WELCKER, GEMEENTE WINTERSWIJK

Winterswijk is doing well with not discharging rainwater to the sewage system, but letting the clean water infiltrate into the ground or directly to the surface water. The municipality designs retention ponds: these slowly release the water into the surface water. This is also needed because otherwise other villages like Lichtevoorde have big problems with heavy rainfall, since they are situated way lower than Winterswijk.

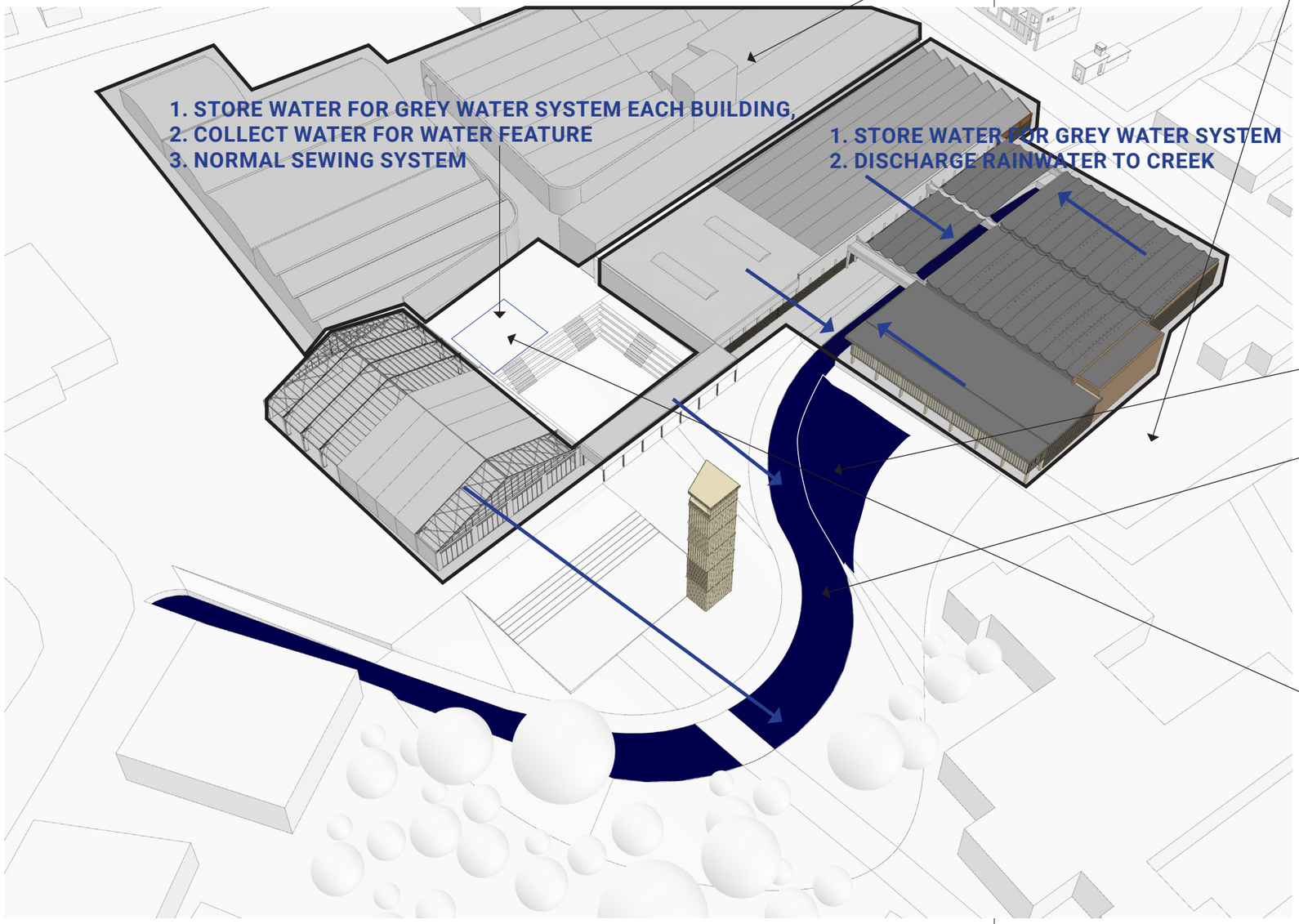
Sizes of a retention pond are roughly 1/5 of 10000 m² roof surface: 1500 m².

For the Morsepoort, it would be best to have the closest buildings to the creek discharging the rainwater directly to the creek. For the other buildings a different solution can be sought. For example storing the water and reusing it for water features could ben an option.

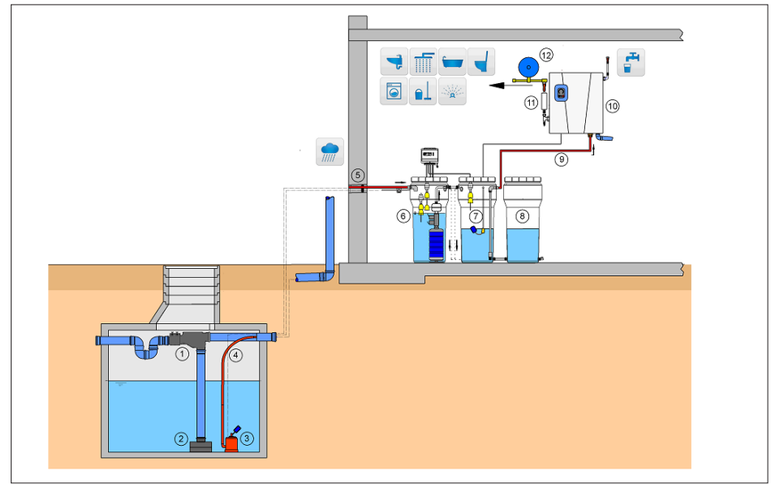
DESIGN OF THE WHEMERBEEK AND PUBLIC SPACE BY MUNICIPALITY

SUSTAINABILITY

WHEMERBEEK - INTEGRATION OF SYSTEMS IN THE MORSEPOORT



UTILIZING RAIN WATER FOR GREY WATER SYSTEM

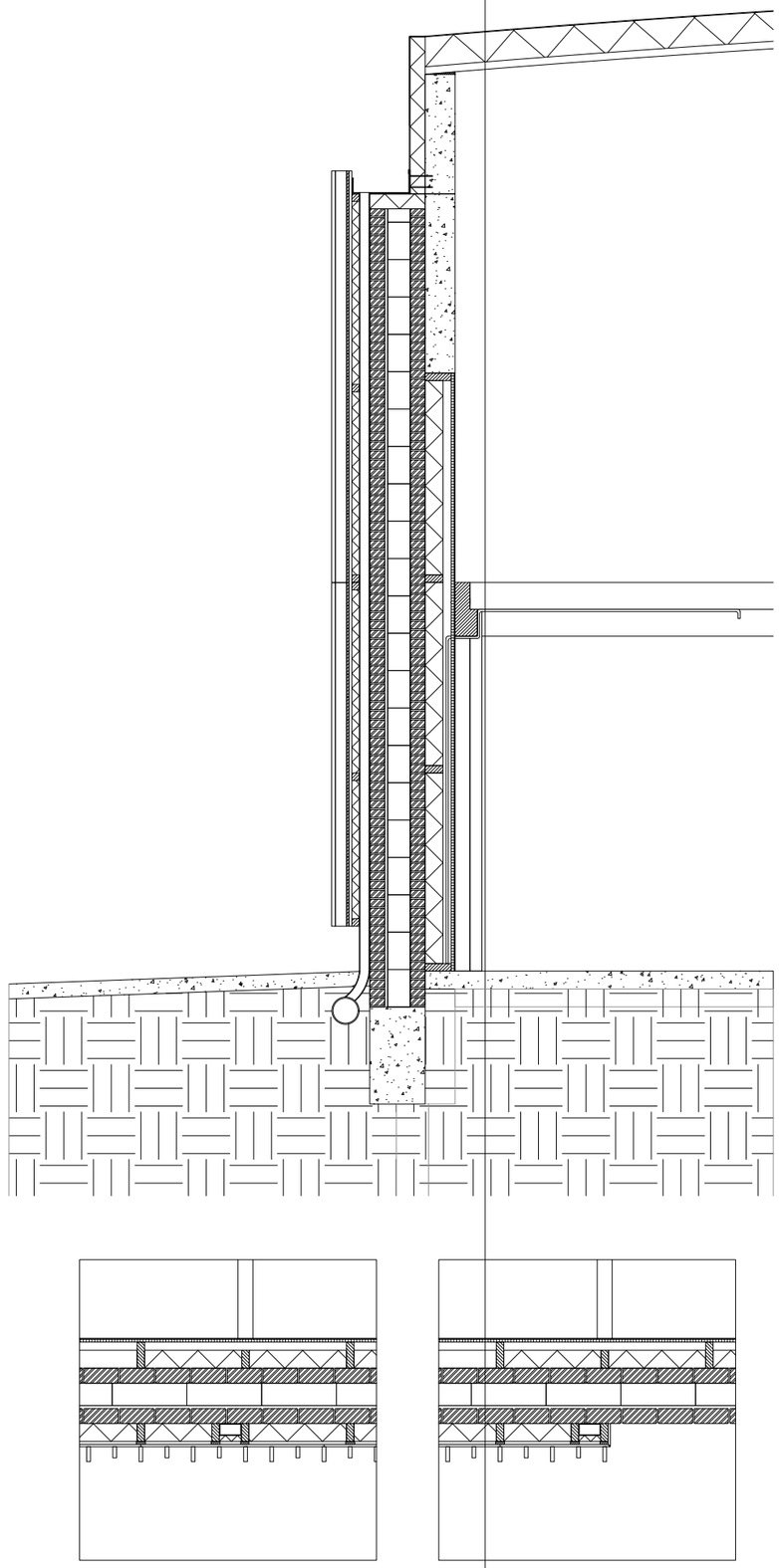


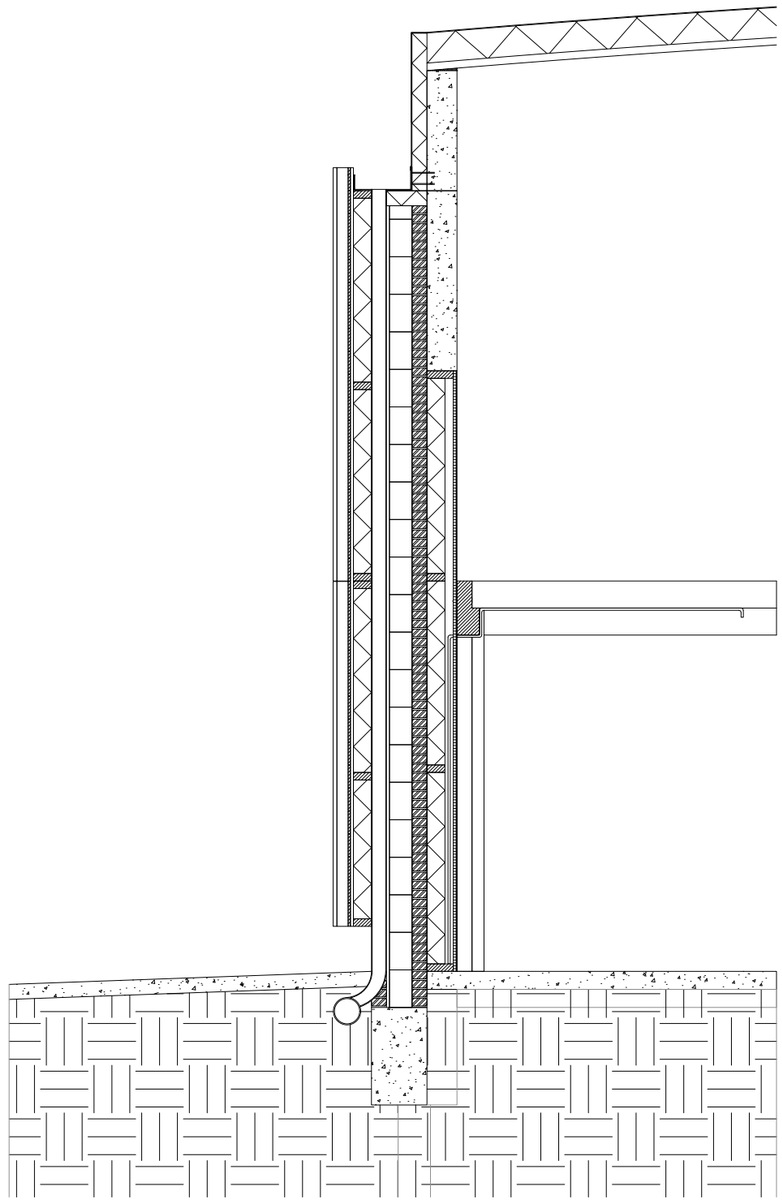
This way of utilizing rain water is even more sustainable then only to use it for the toilets. It can be used for:

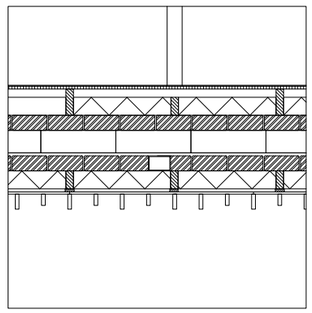
- Flushing of toilets
- Washing machines
- Outdoors use and cleaning
- Personal hygiene: washing and showering

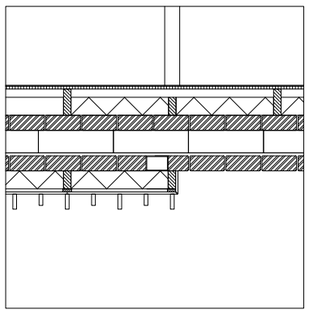
BUILDING TECHNOLOGY

FAÇADE A



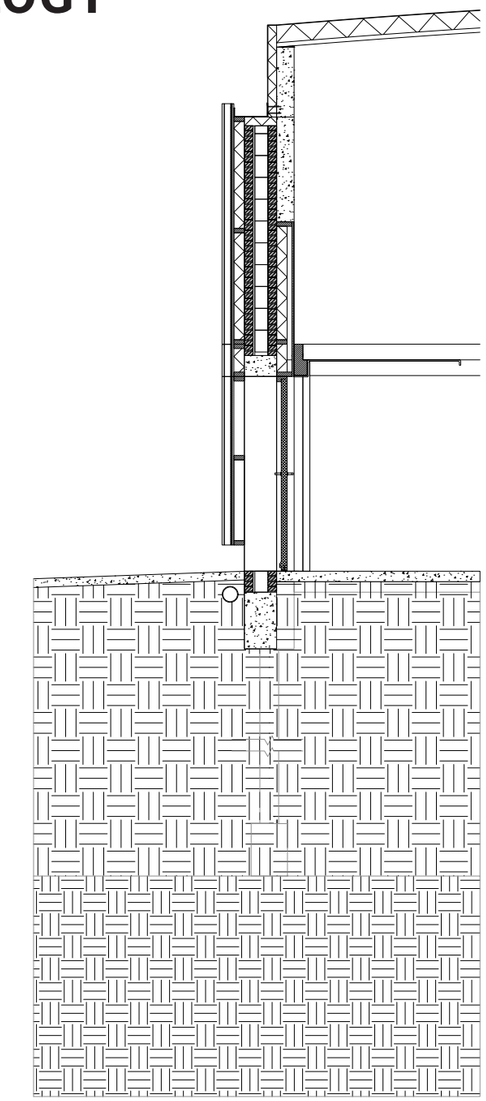


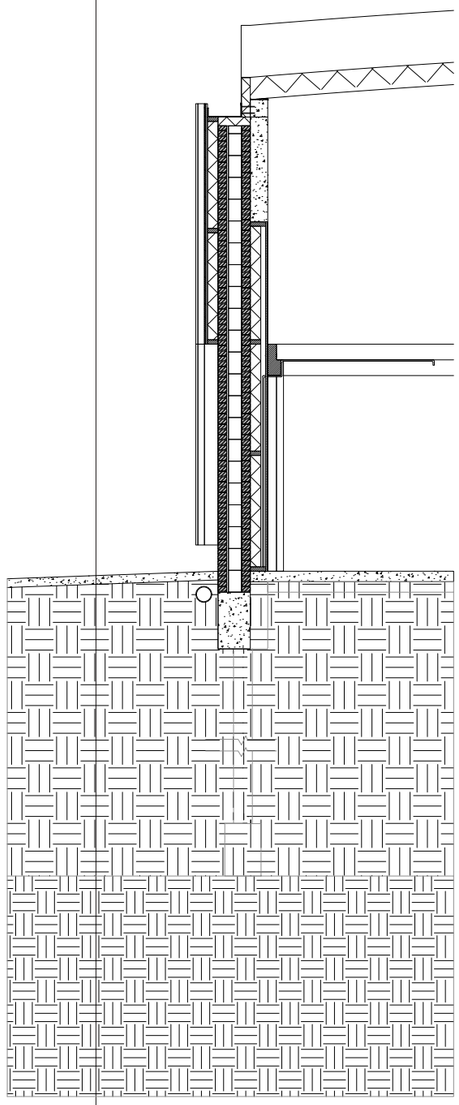


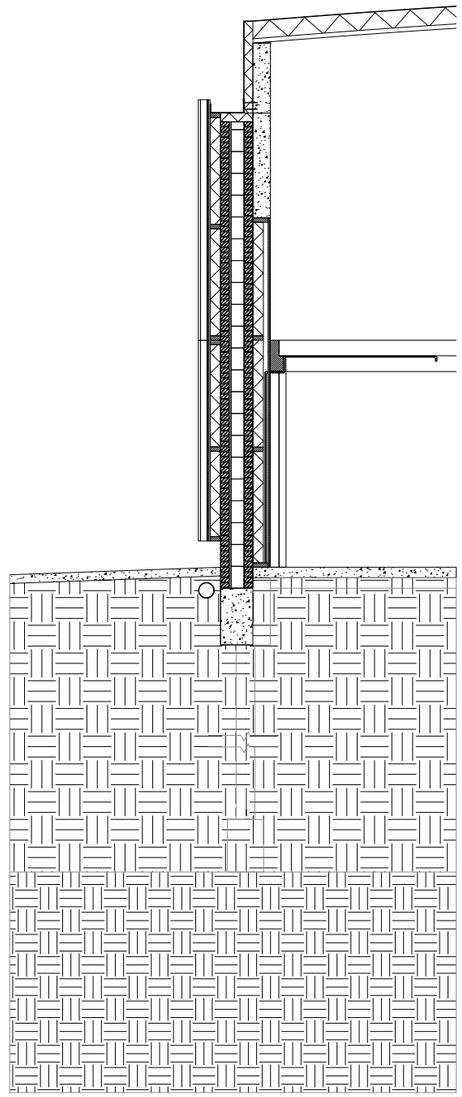


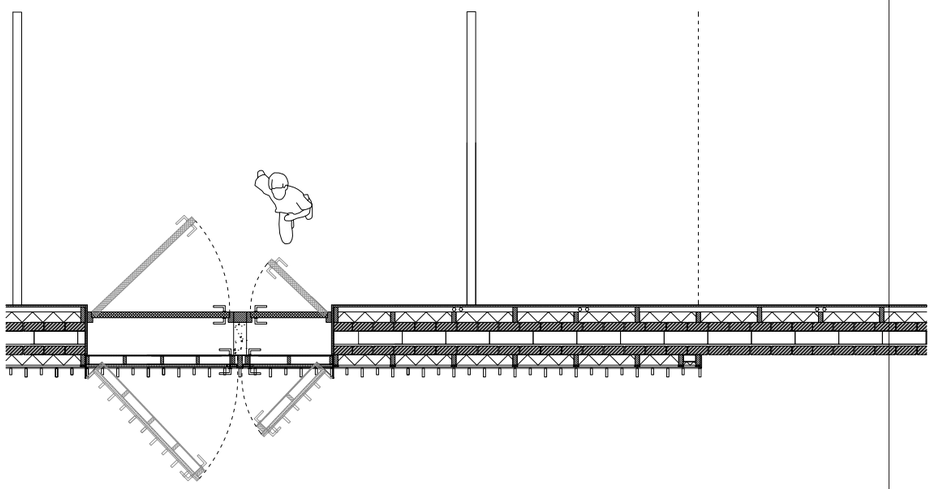
BUILDING TECHNOLOGY

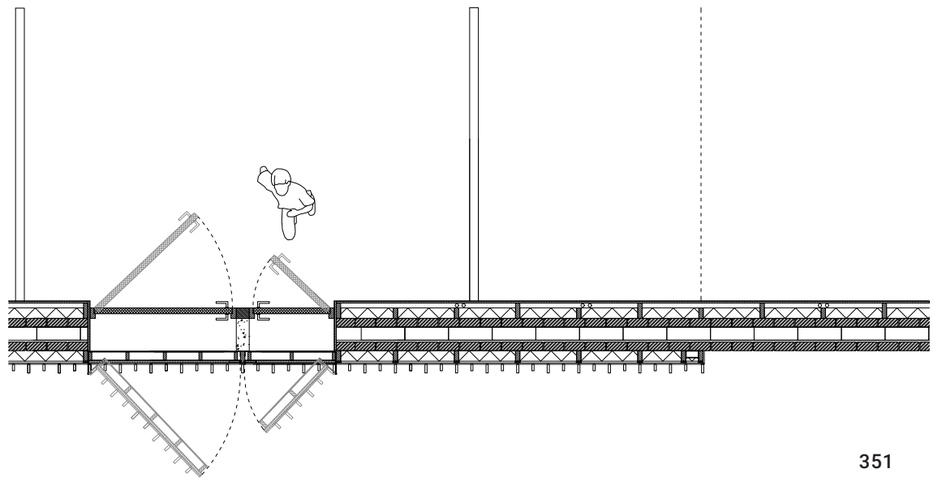
FAÇADE A





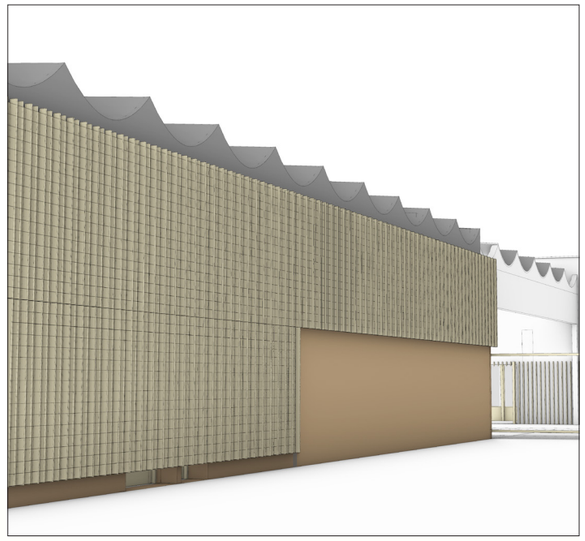


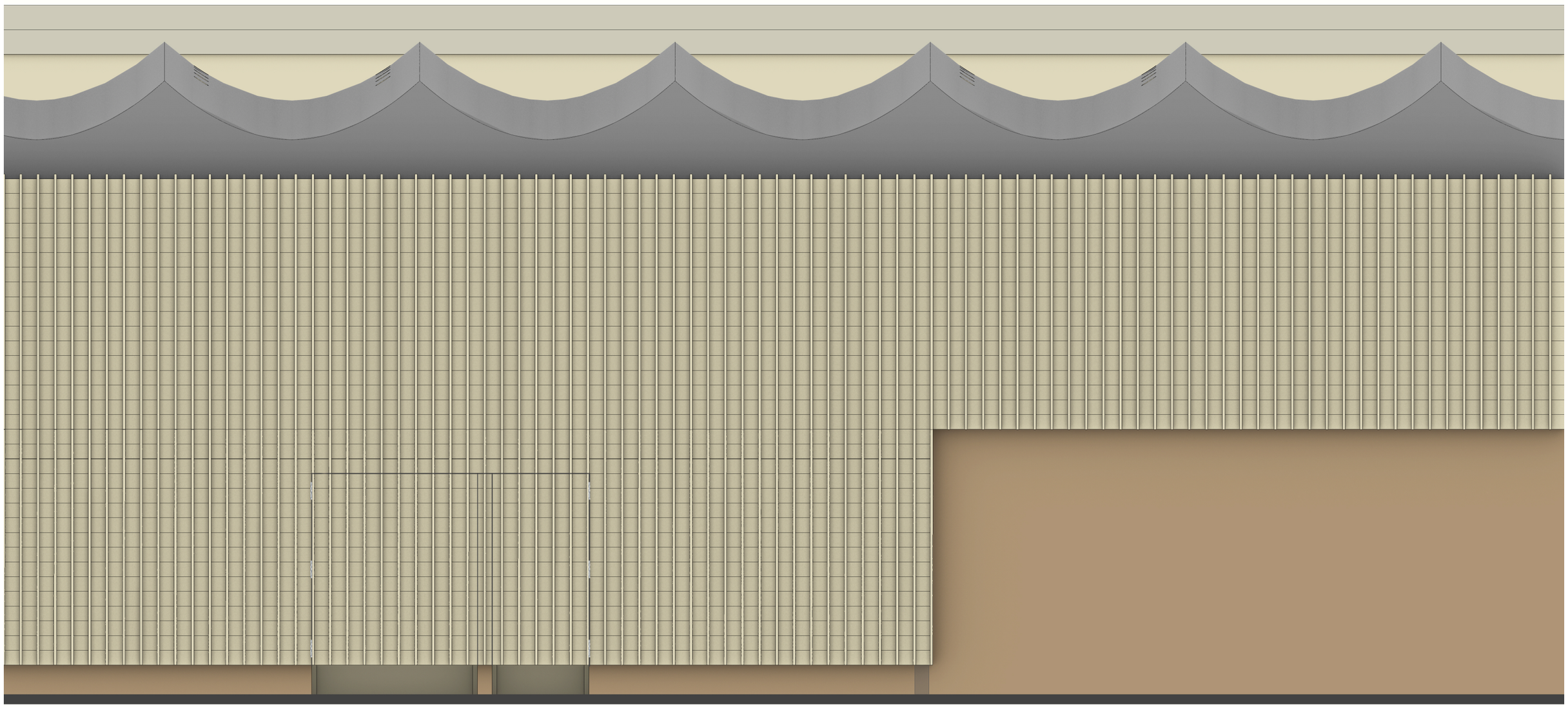




BUILDING TECHNOLOGY

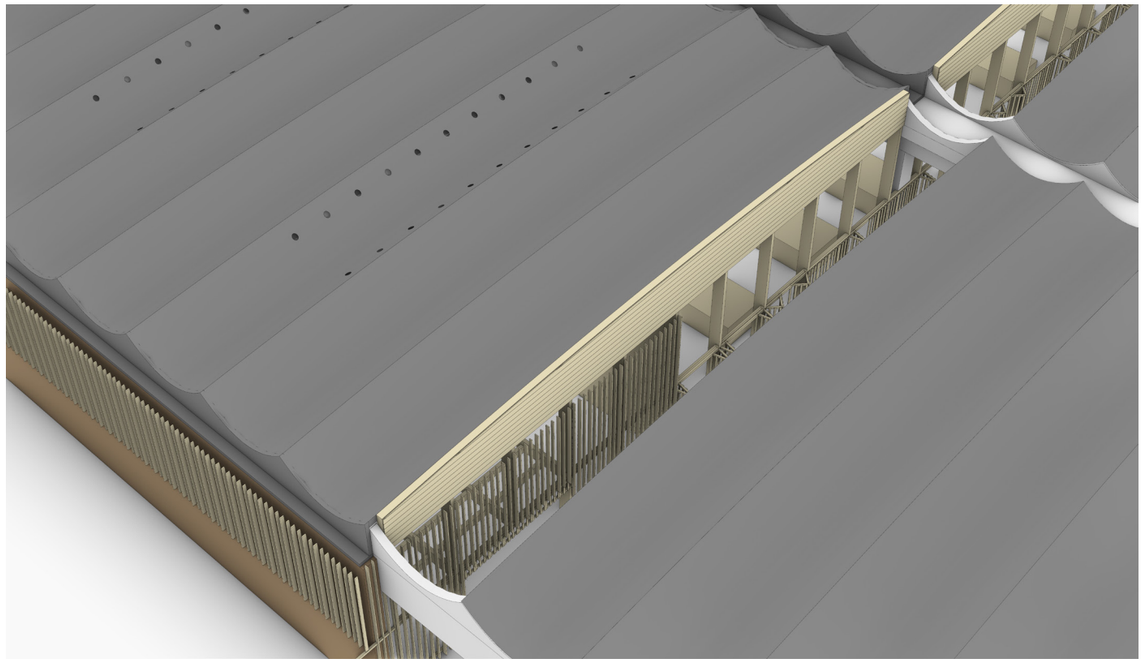
FAÇADE A

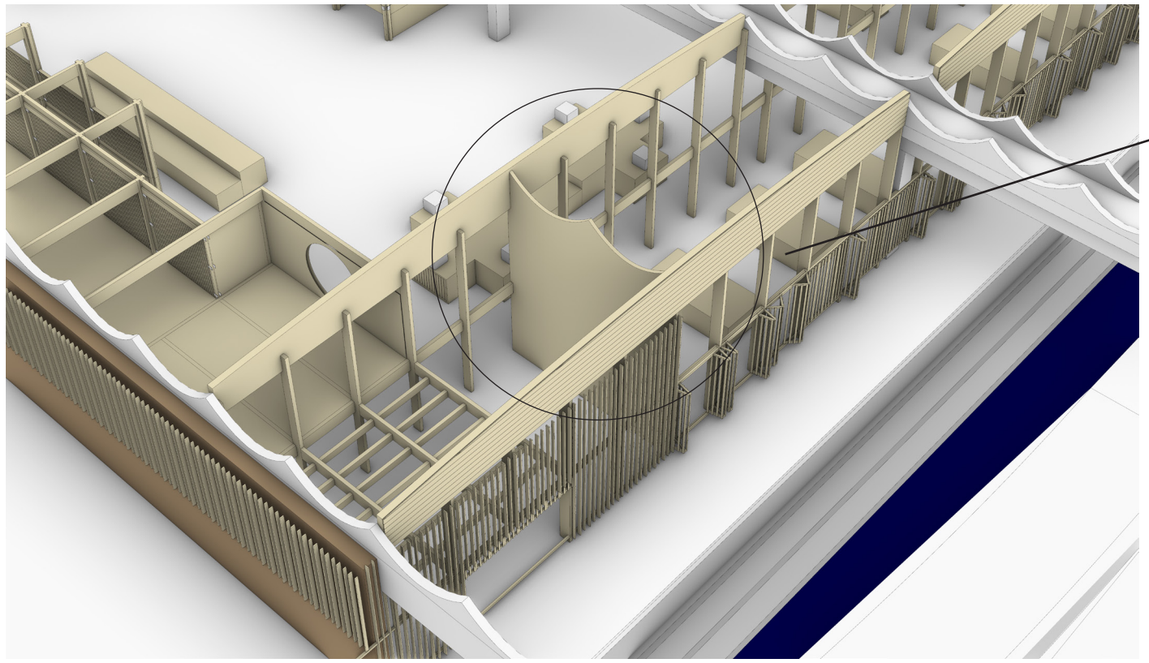




BUILDING TECHNOLOGY

DETAIL B - OPTIONS





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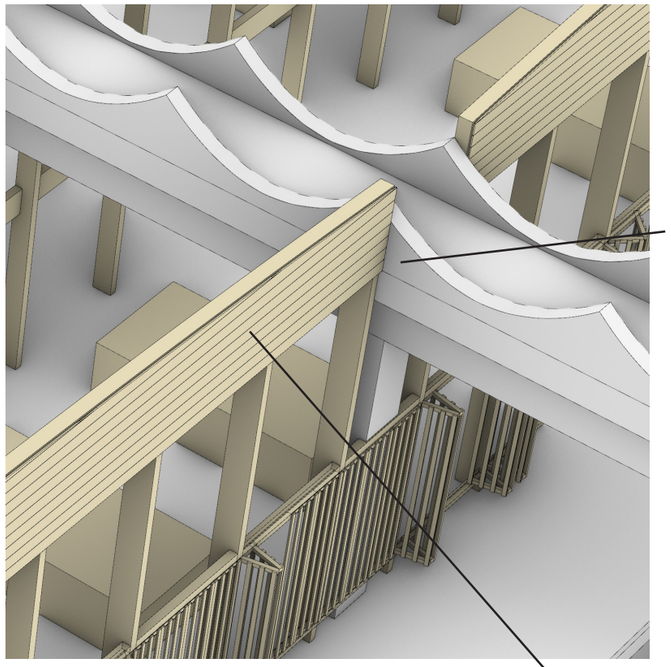
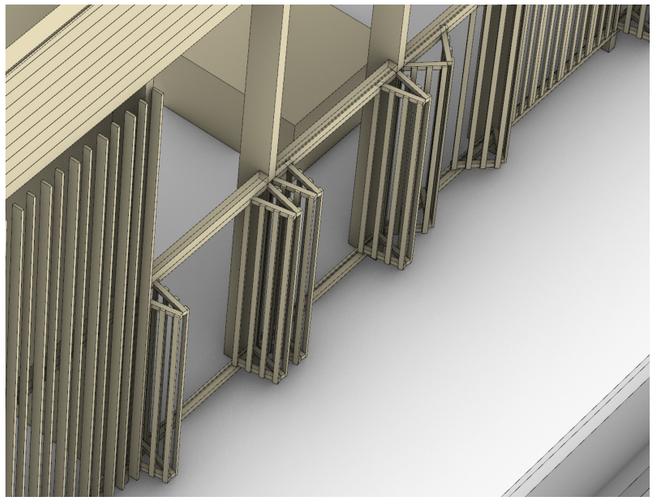
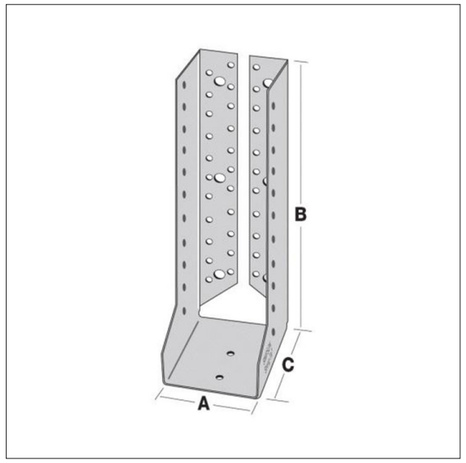
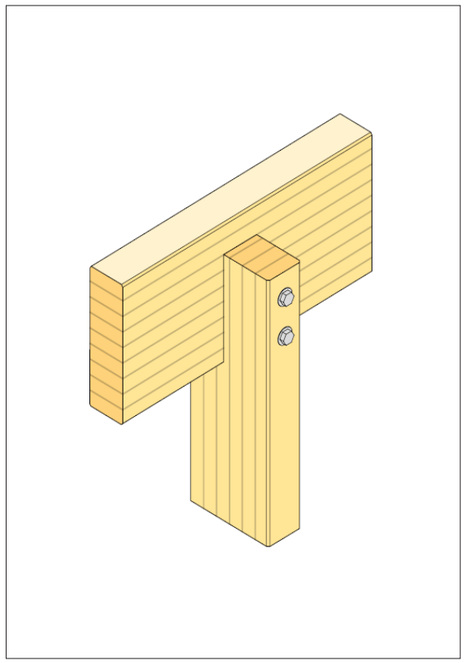


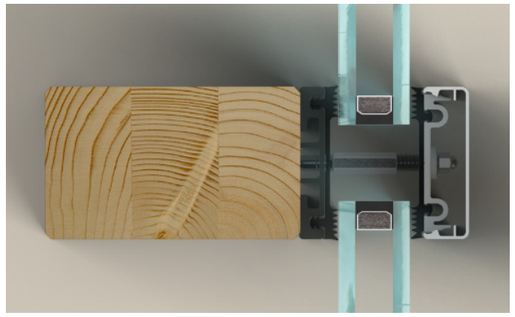


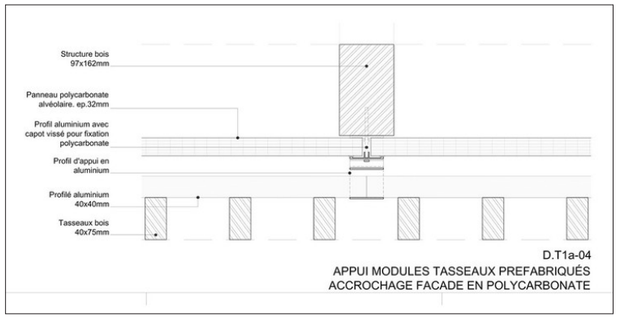


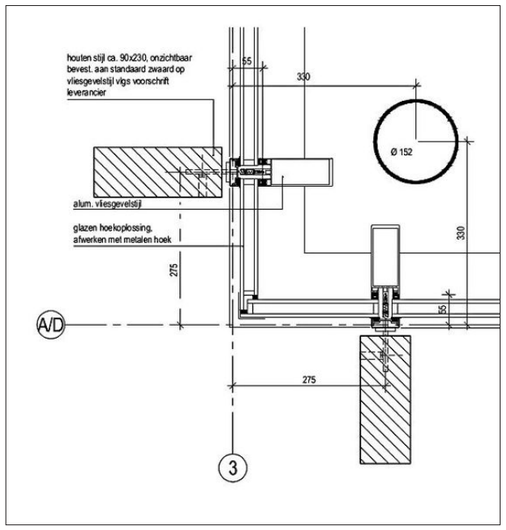


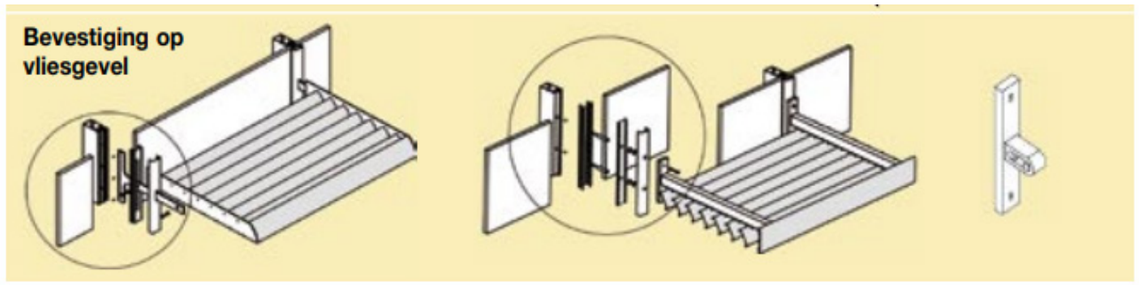
BUILDING TECHNOLOGY

DETAIL B - INSPIRATION AND TECHNICAL ASPECTS



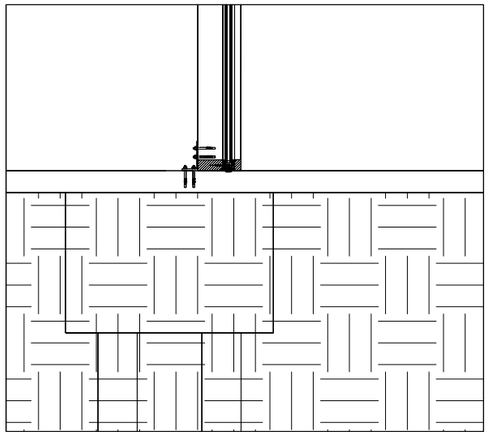


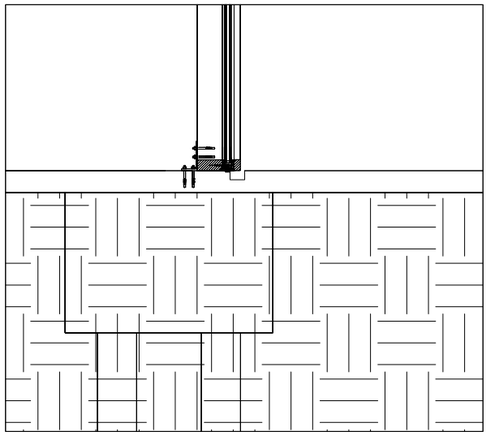


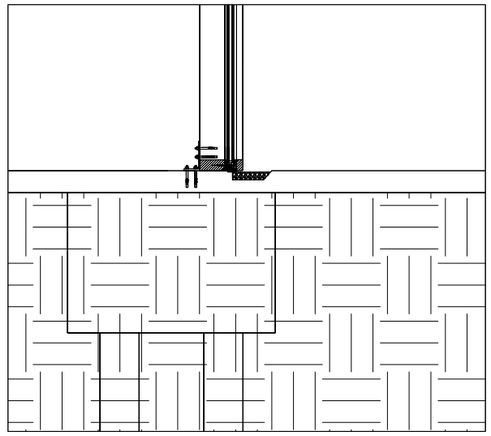


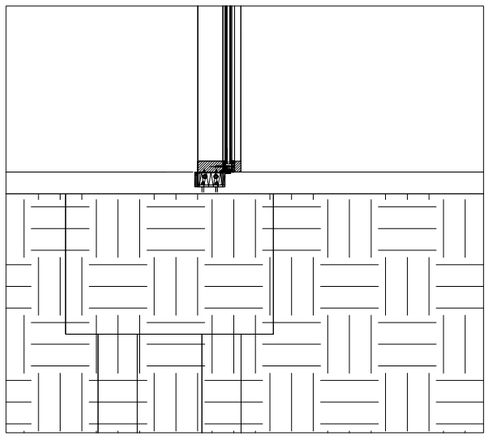
BUILDING TECHNOLOGY

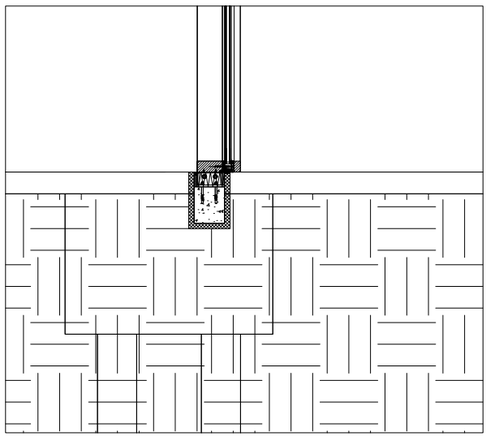
DETAIL B

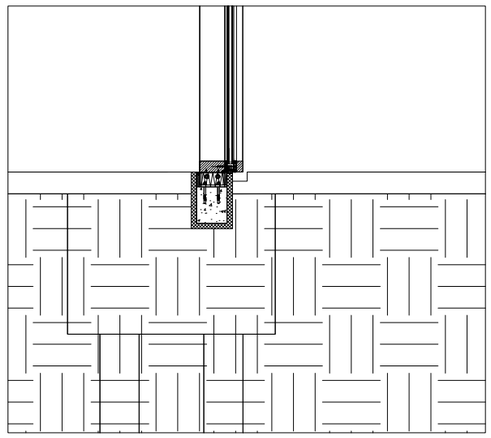


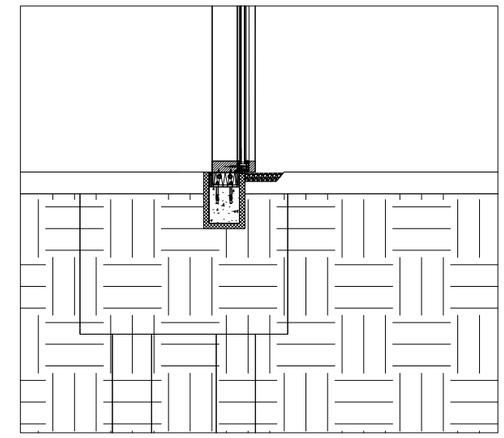


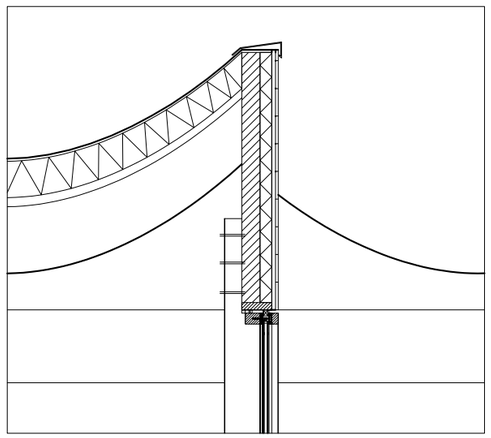












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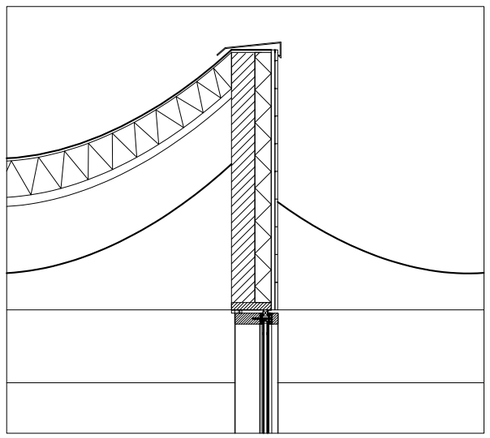

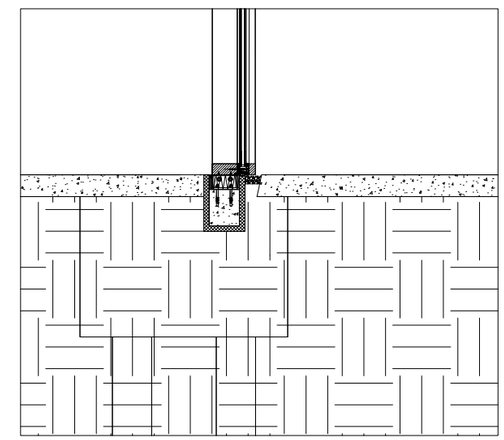

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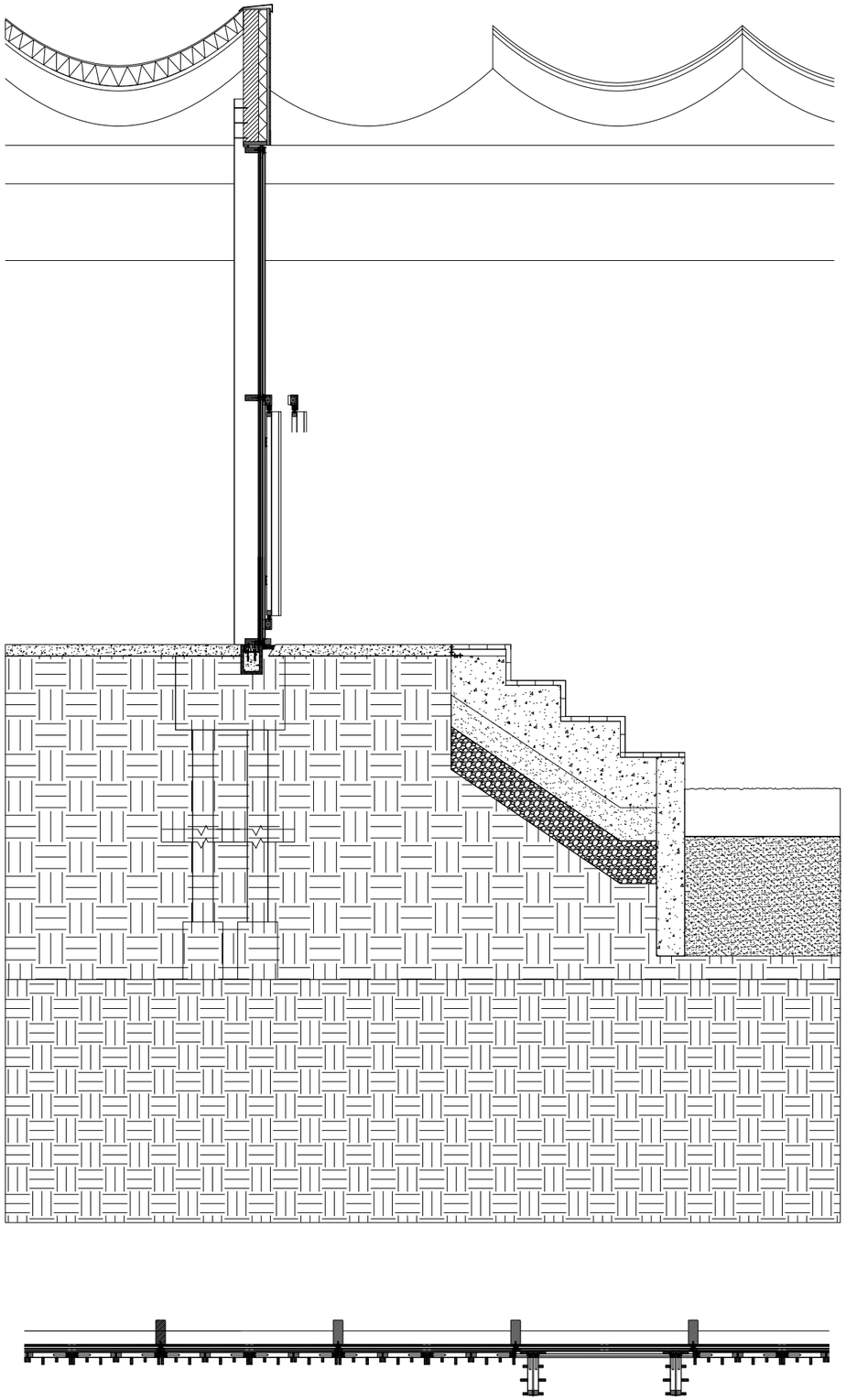
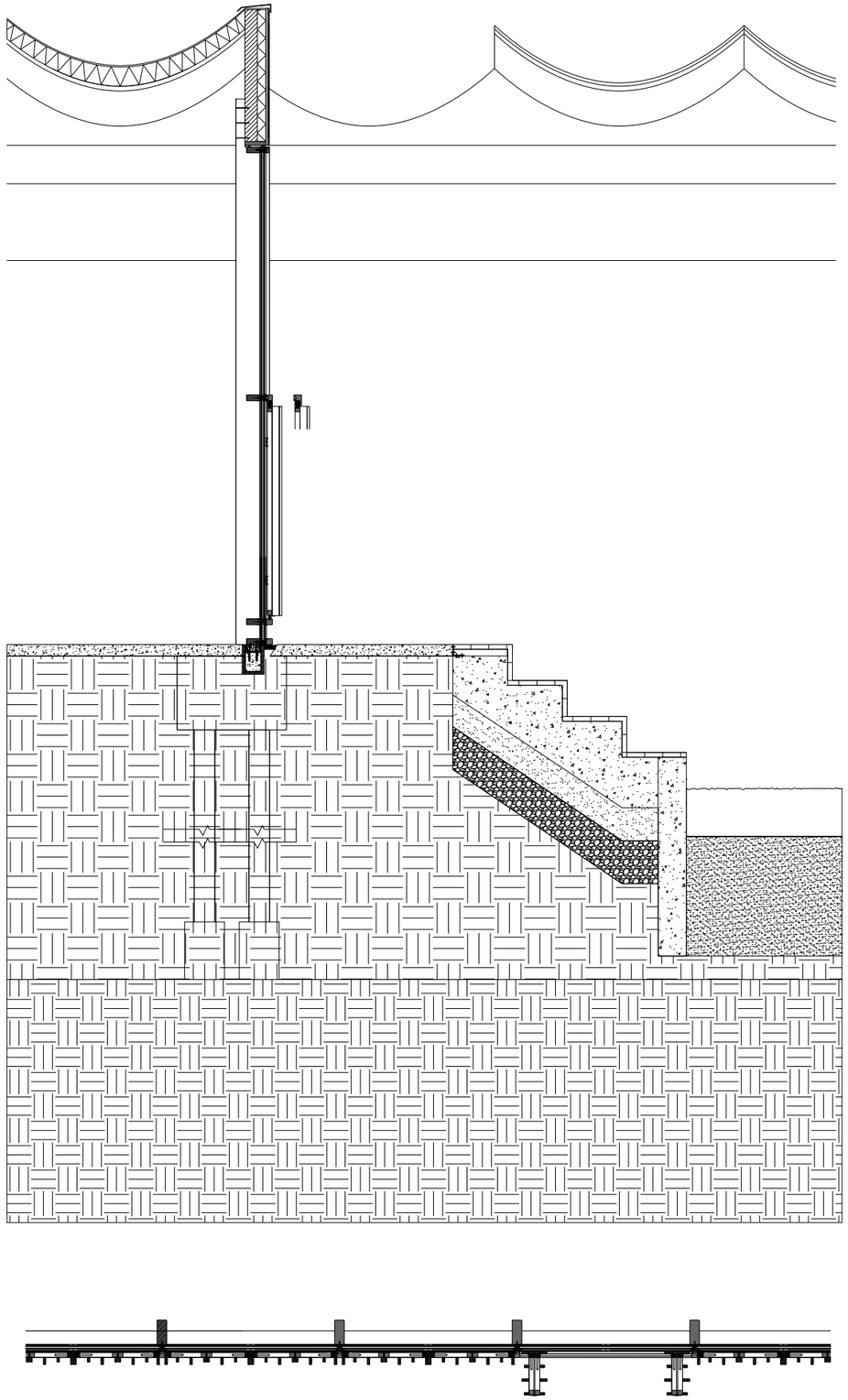
BUILDING TECHNOLOGY

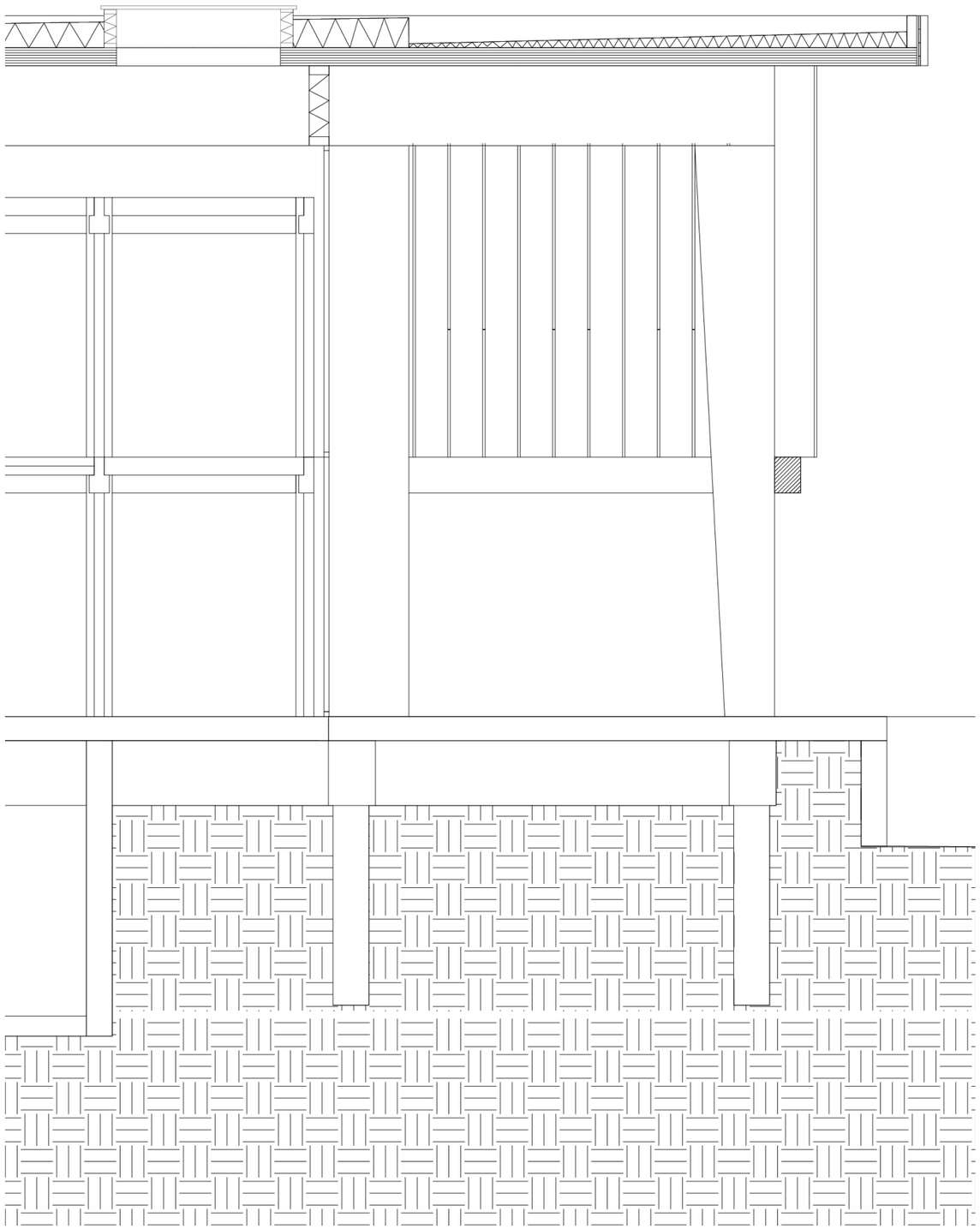
DETAIL B



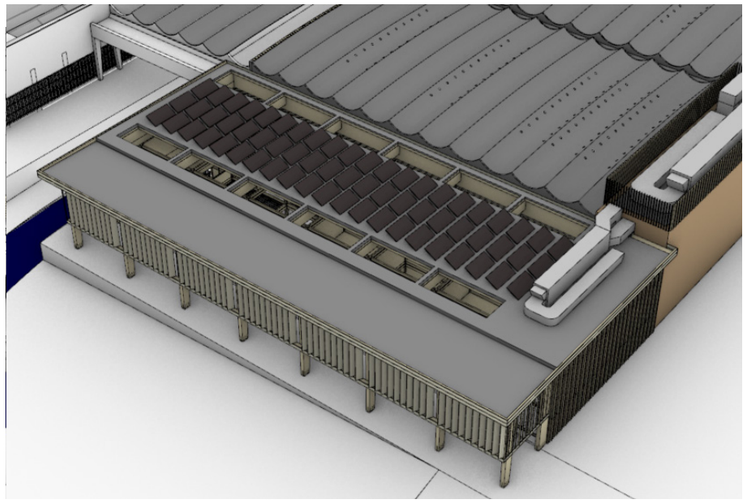


BUILDING TECHNOLOGY

DETAIL B



PV CELLS

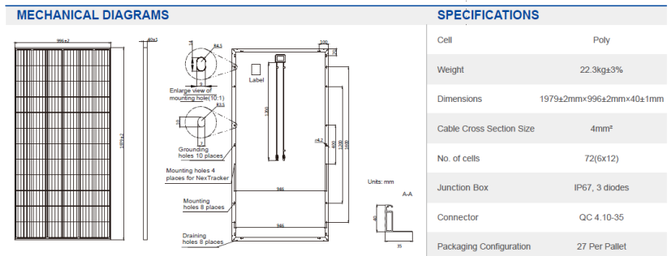


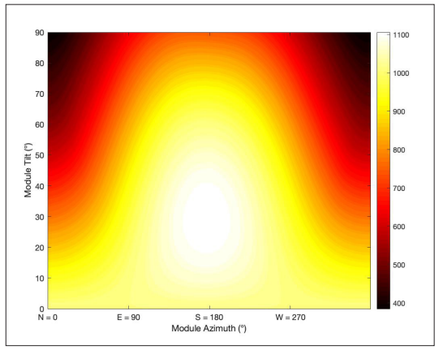
Energy use, offices >20 people = 115 kWh m²

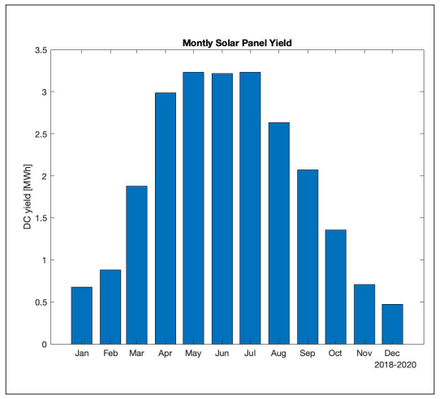
480 m² * 115 = 55200 kWh
= 55,2 mWh

63 panels of 2 m² = 23.35 mWh solar power yield

The buiding can compensate for half of its own use of electricity throughout the year, when delivering power back to the grid.







BUILDING TECHNOLOGY

VENTILATION AND OTHER INSTALLATIONS

Recht luchtkanaal 500 mm x 450 mm L=1500 mm

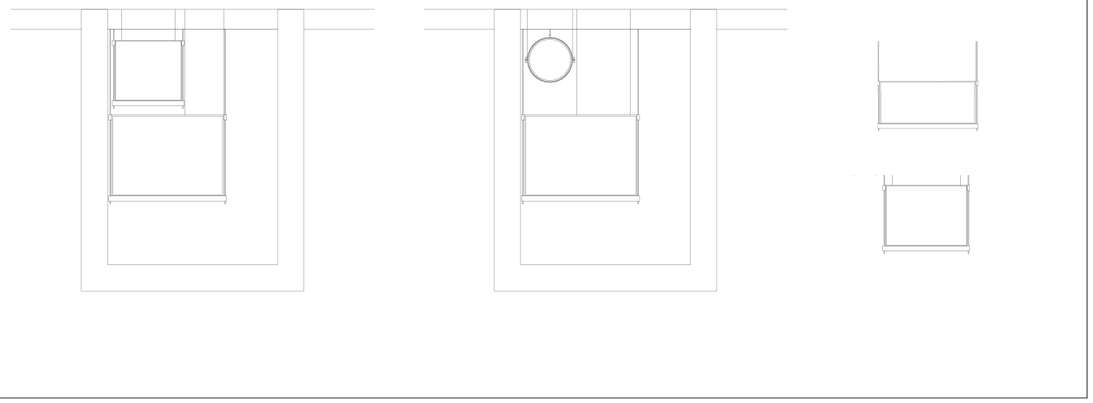
Spirobuis Ø 600mm x 3 meter

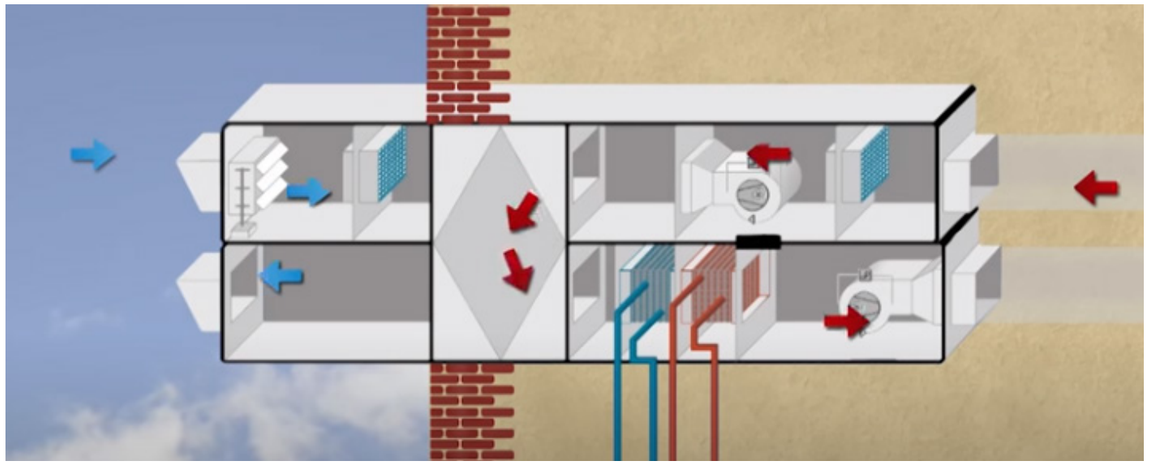
Recht luchtkanaal 600 mm x 250 mm L=1500 mm

Recht luchtkanaal 800 mm x 600 mm L=1500 mm

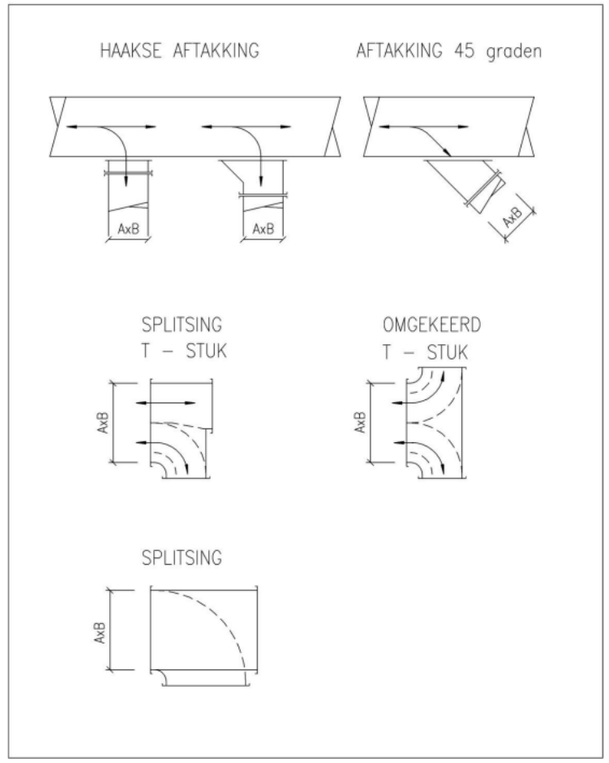
Recht luchtkanaal 800 mm x 600 mm L=1500 mm

Recht luchtkanaal 600 mm x 450 mm L=1500 mm



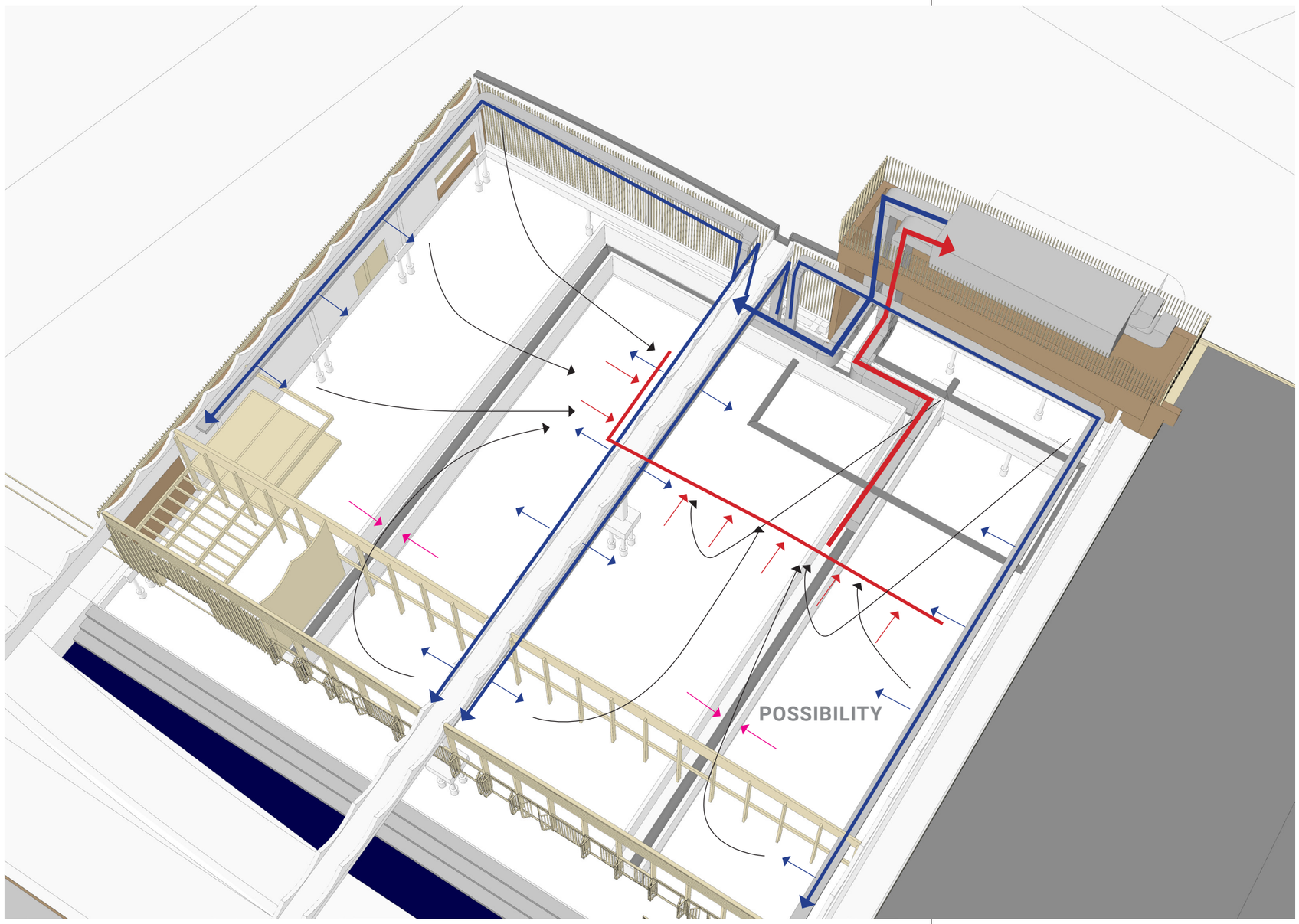


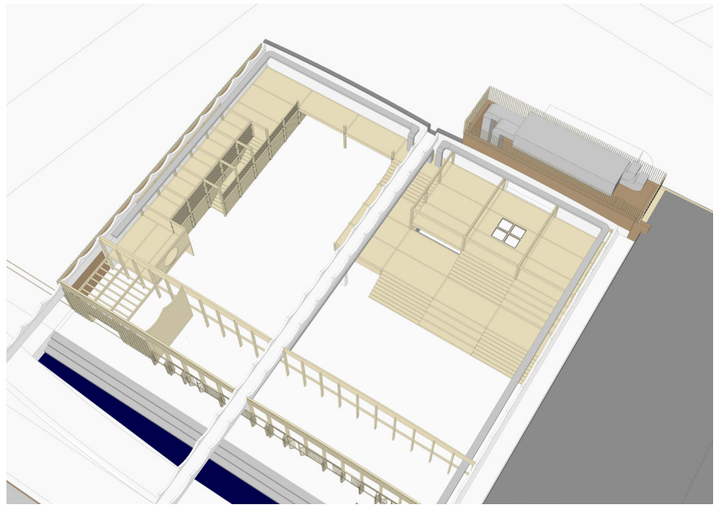
L: 1650
B: 1020
H: 1990

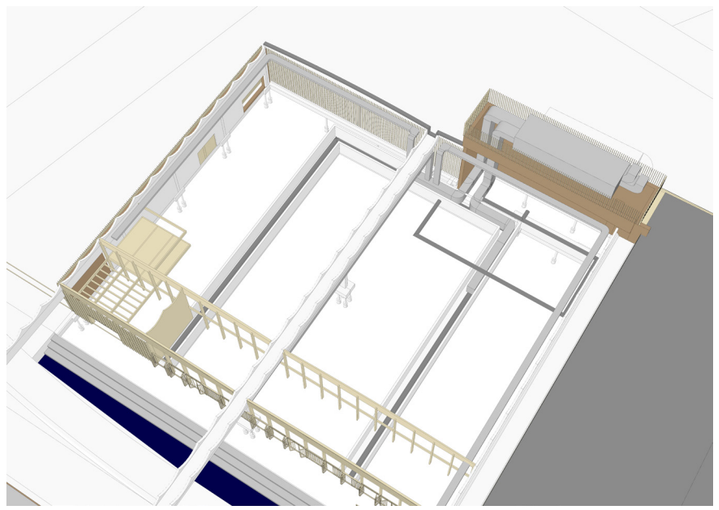


BUILDING TECHNOLOGY

VENTILATION





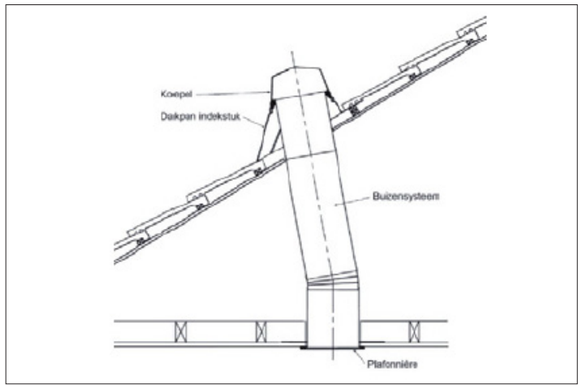


TIMBER TOWN

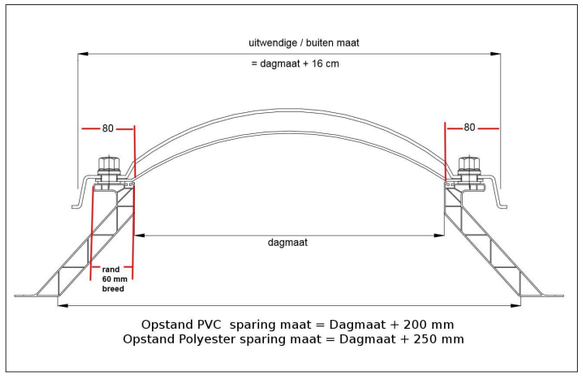
11-06-2020

BUILDING TECHNOLOGY

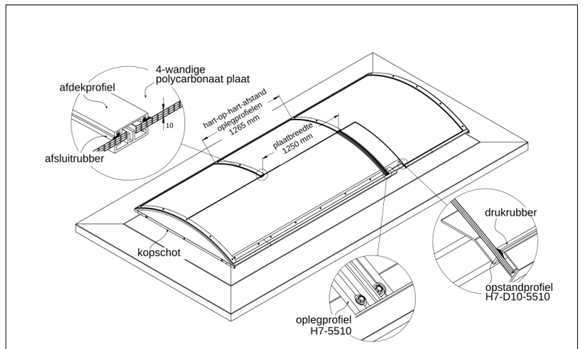
ROOFLIGHTS: 3 OPTIONS



- Lighttube. Usually this is used to get diffuse light inside small dark spaces, but without the reflector and lit in the ceiling it could function as a small circular rooflight. Advantages are the size (25 cm), quick installation time and waterproofness. A very large disadvantage is the price: about 600 euros per rooflight. Therefore the amount of rooflights can be brought back to 12 lights per shell, with a total of 96 rooflights. This will be 57600 euros, without labour costs. It is an option but it is a very expensive one.

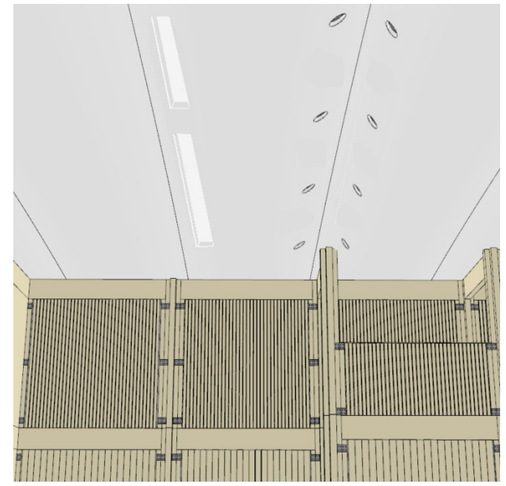


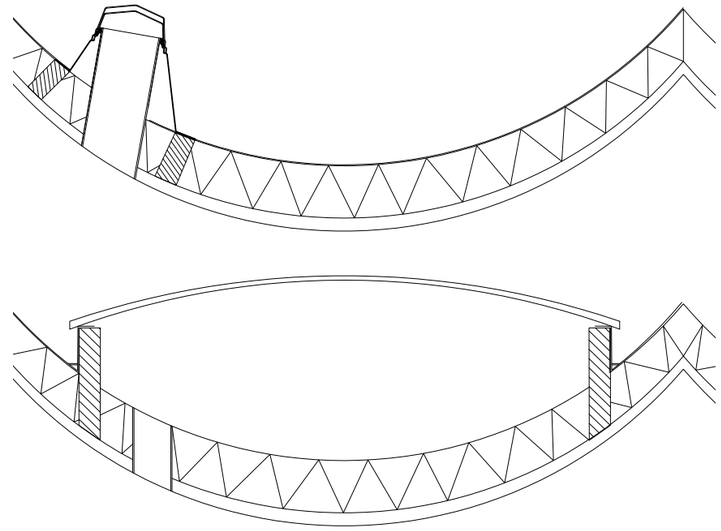
- Rooflight. This is the regular solution. It is a cheaper option, where one rooflight can only cost 100 euros. The disadvantage is the size of the rooflights, where the smallest circular rooflight is 40 cm in span. Previous sunray simulations show that this size is too big for the building, where it could cause rays of sunlight to hit the workspaces. Therefore these rooflights are no option.

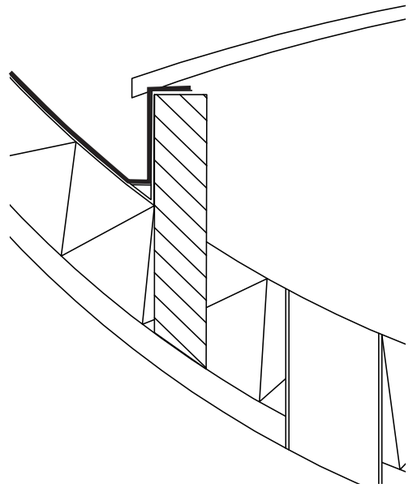


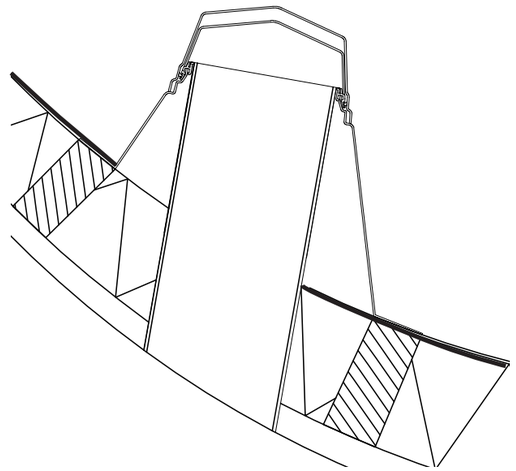
- Making the holes in the existing shells and placing a big rooflight over all the holes. These come with a minimum width of 1140 mm. It could be a possiblity, but it might be too difficult to work with the double curved surface of the shells here. Maybe with a custom made timber frame it would be possible. It definitely will be the cheapest option. Here also a different shape of sliths in the shells could be possible.

The question is: what do you gain with the rooflights, since it is a lot of money and very labour intenstive. It could also be very nice to improve the artificial lighting.



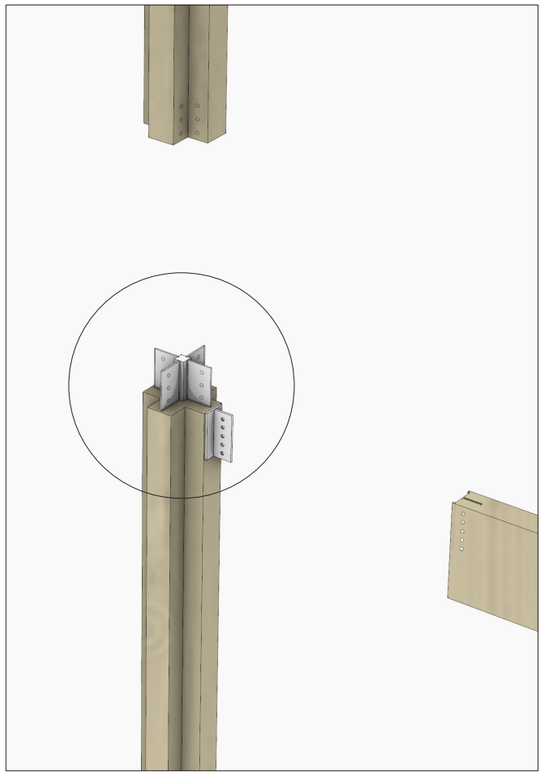


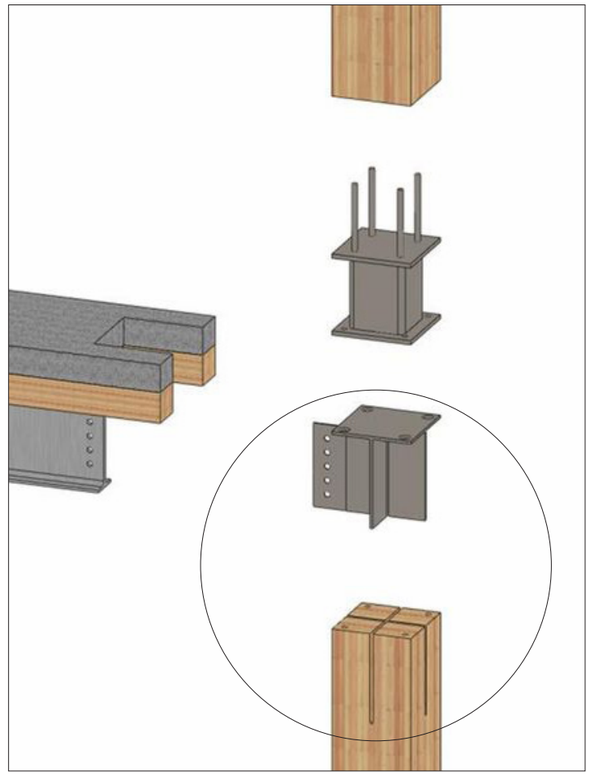




BUILDING TECHNOLOGY

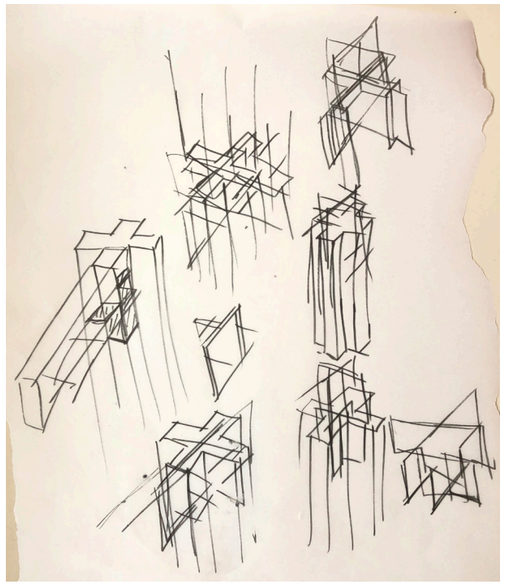
MODULAR TIMBER STRUCTURE

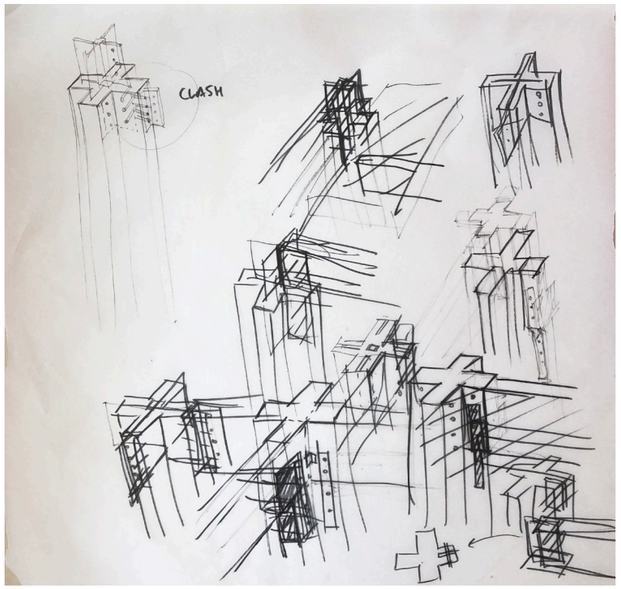


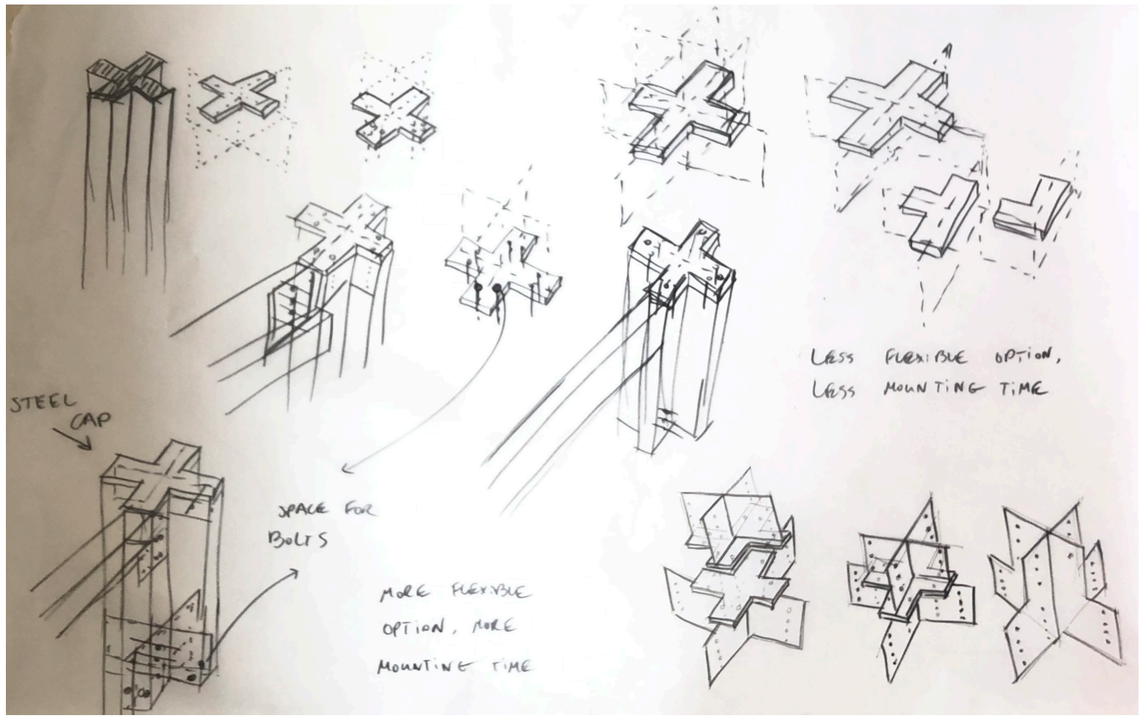


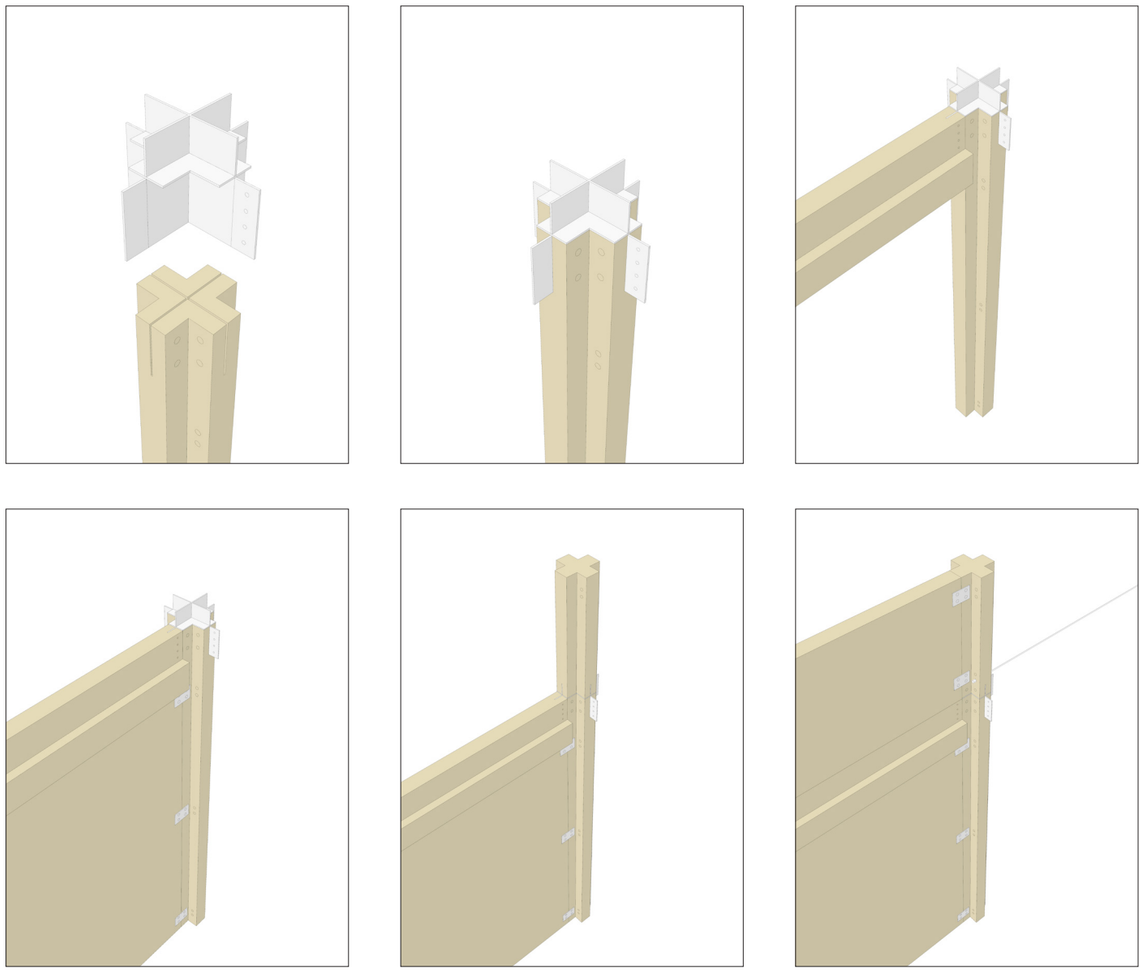
BUILDING TECHNOLOGY

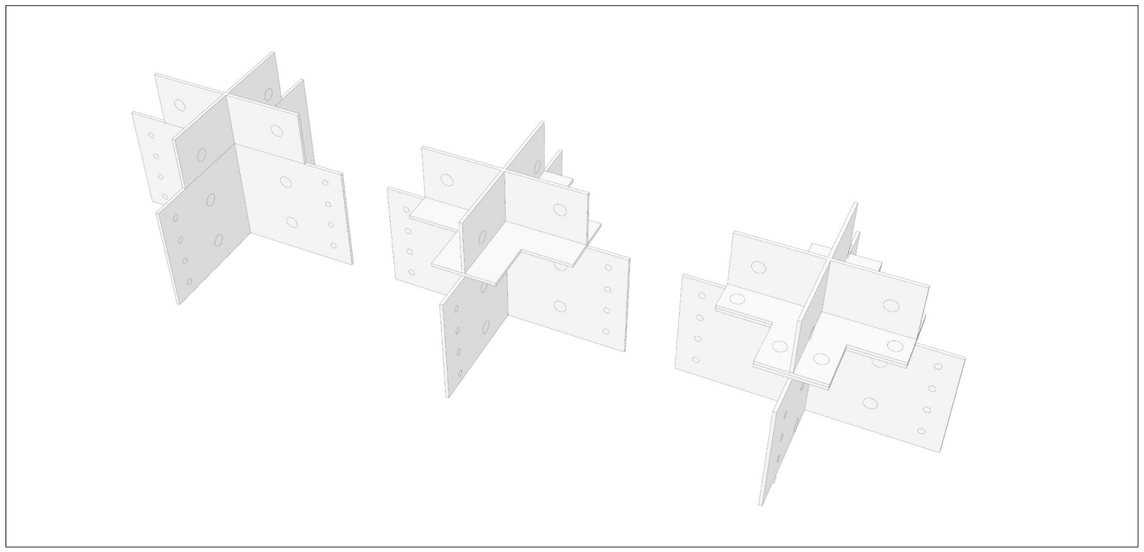
MODULAR TIMBER STRUCTURE





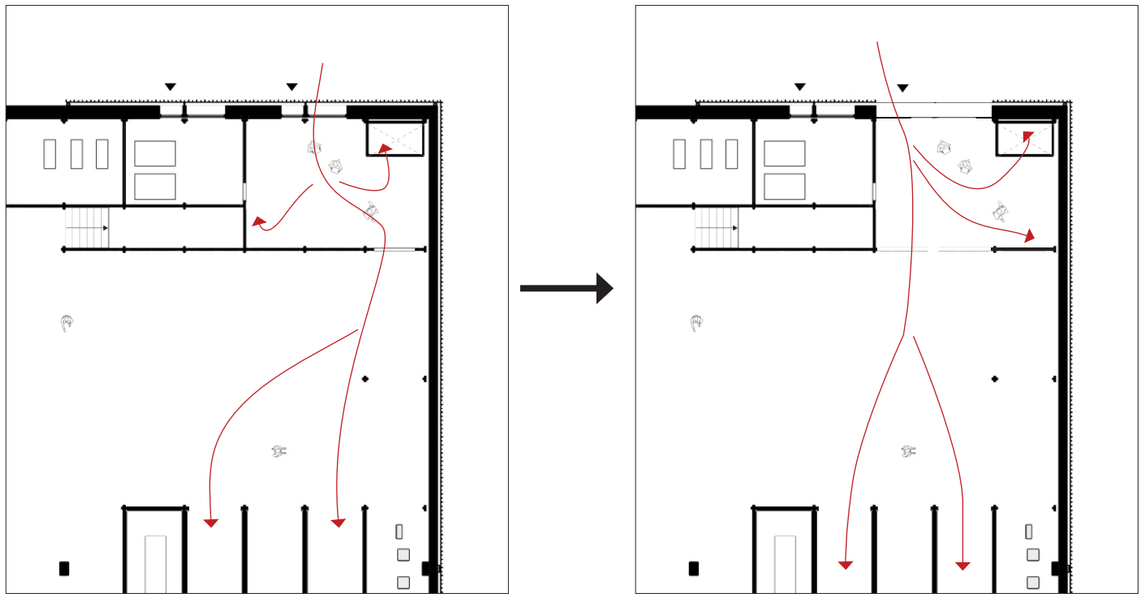


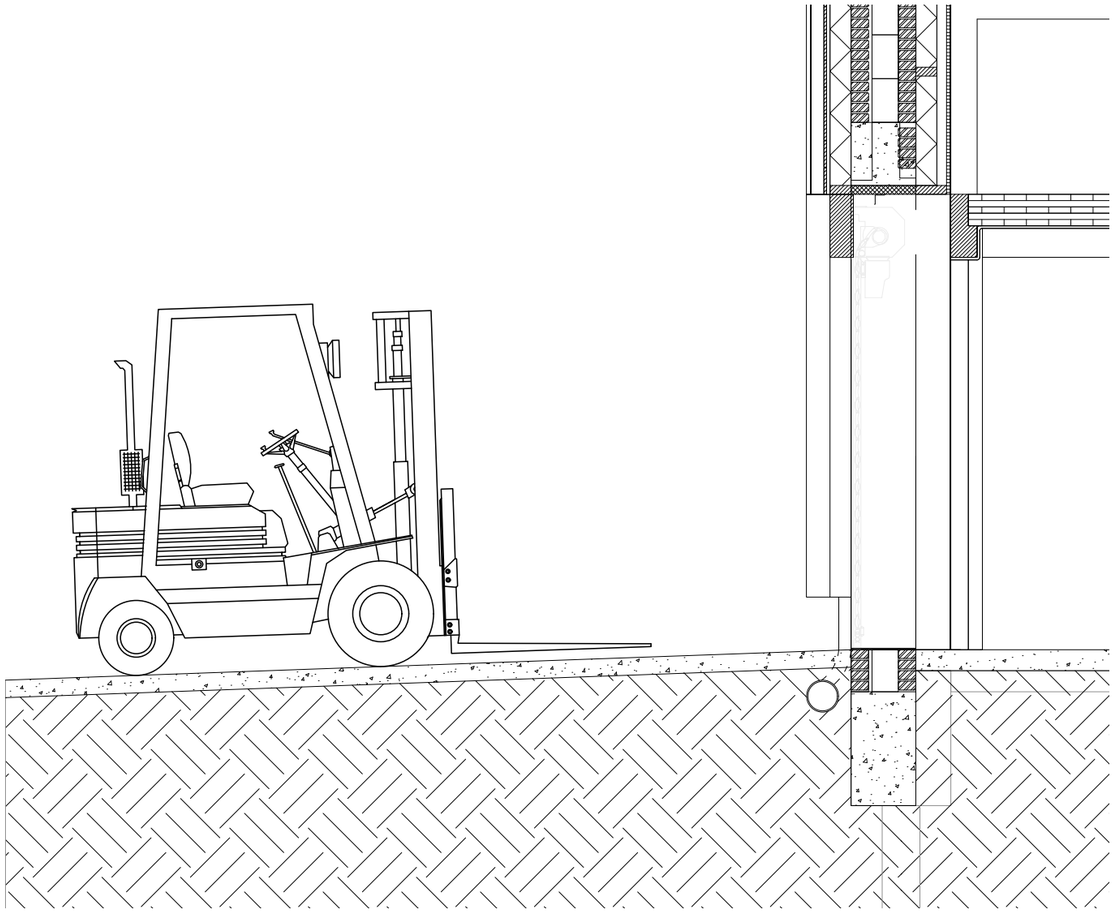




BUILDING TECHNOLOGY

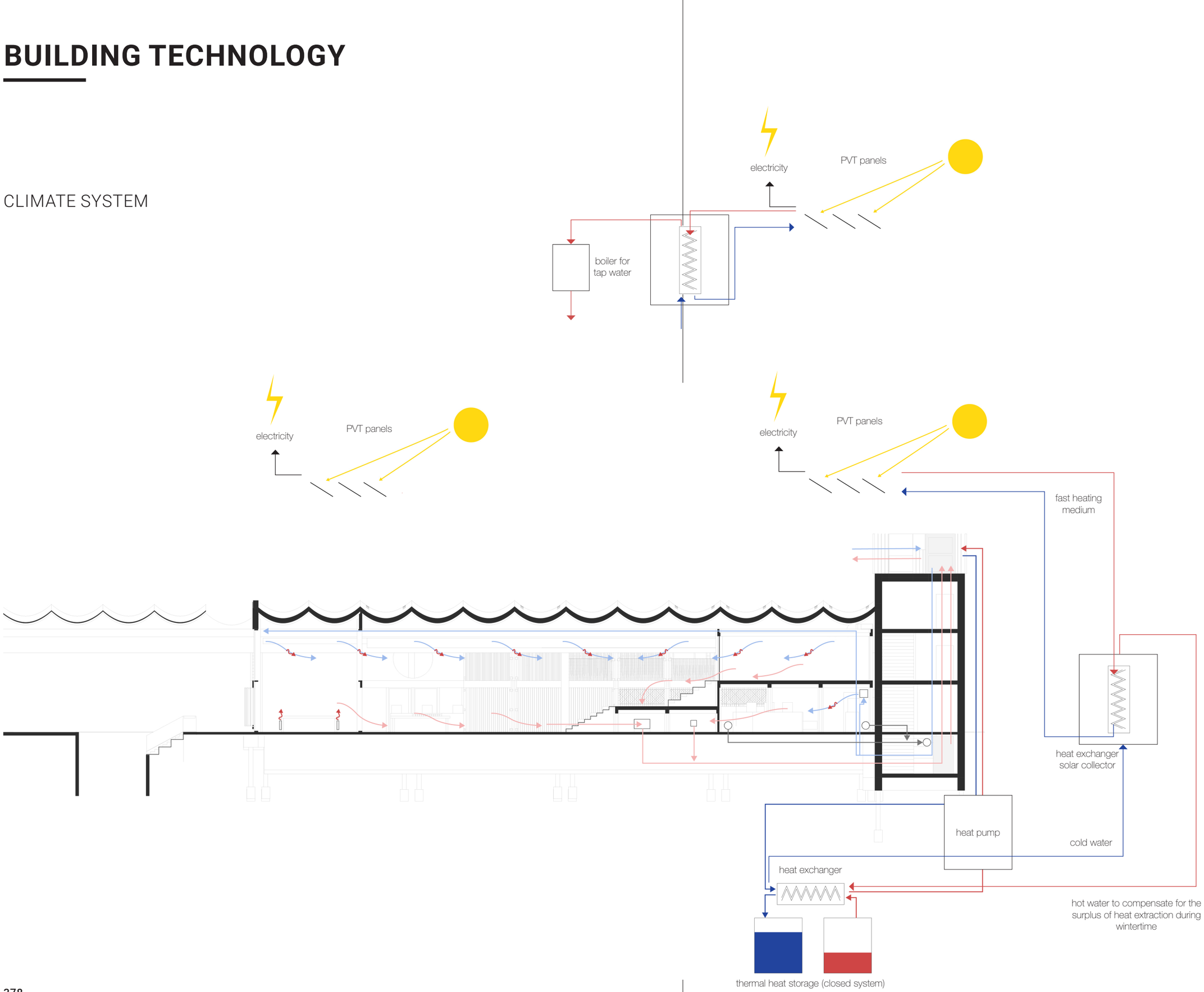
FUNCTIONALITY AND DETAILS





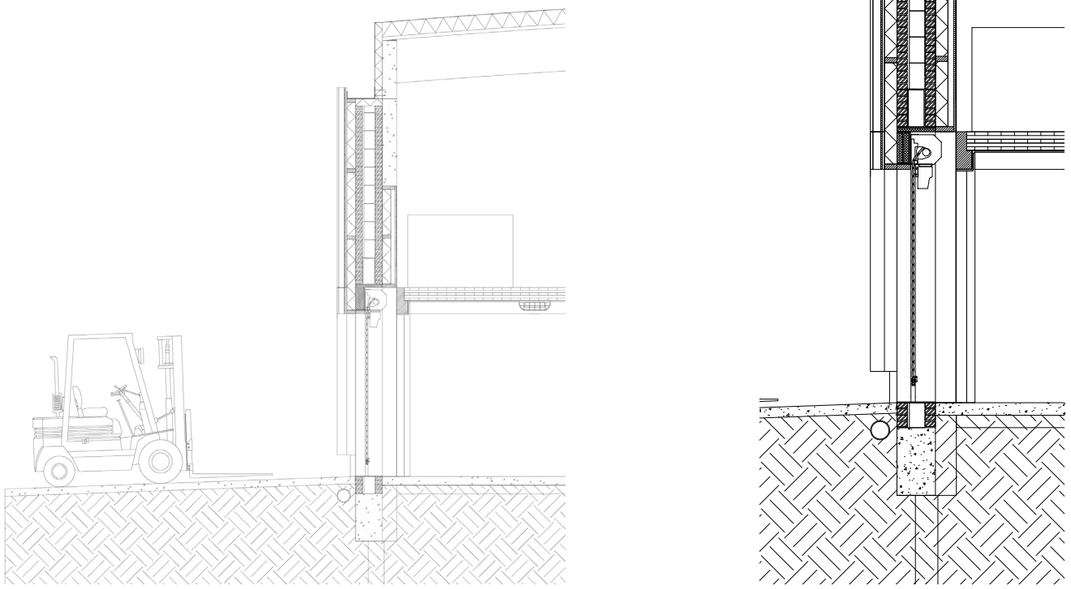
BUILDING TECHNOLOGY

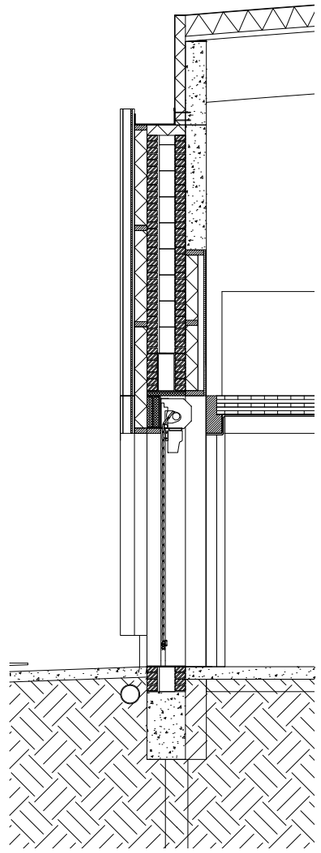
CLIMATE SYSTEM



BUILDING TECHNOLOGY

DETAIL GARAGE DOOR, OPTIONS





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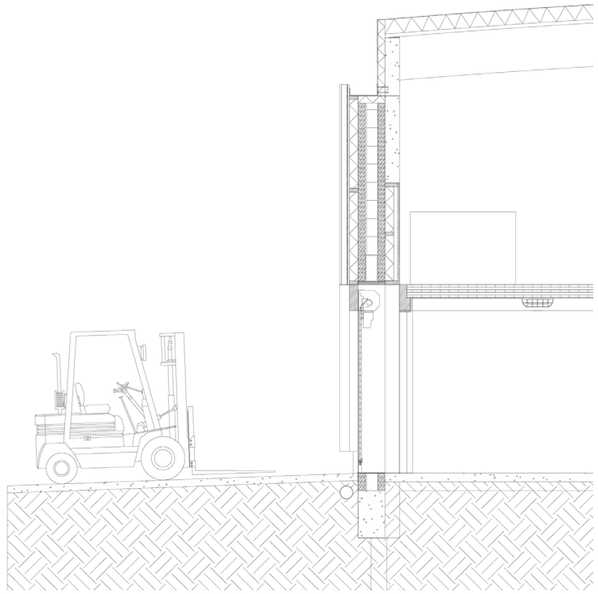

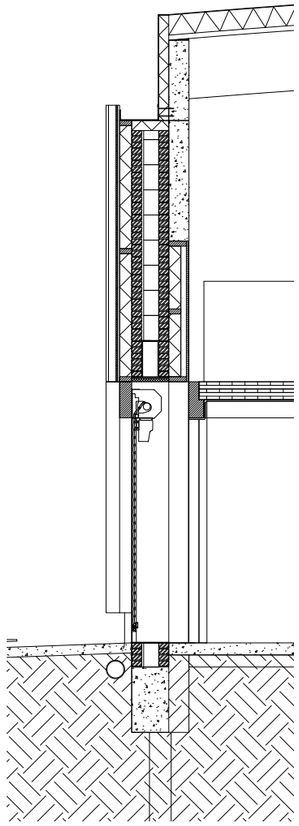

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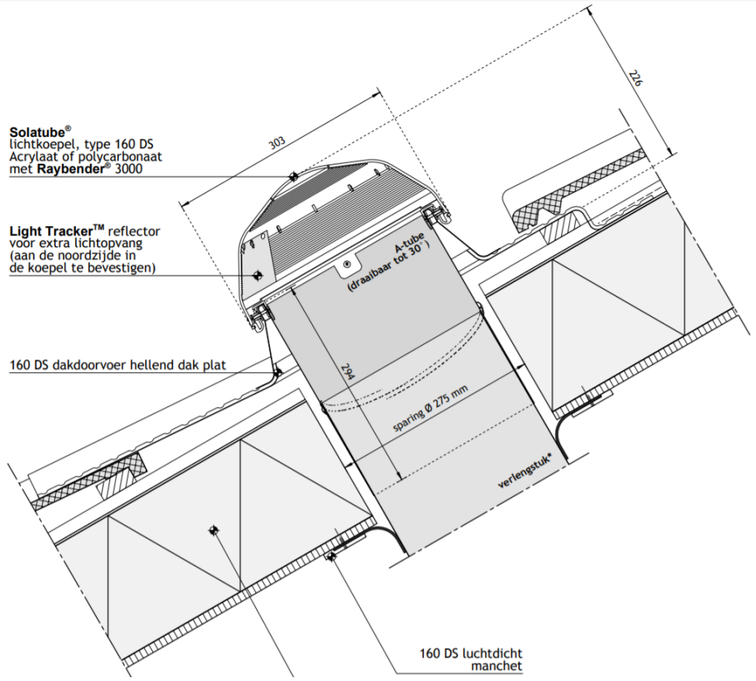
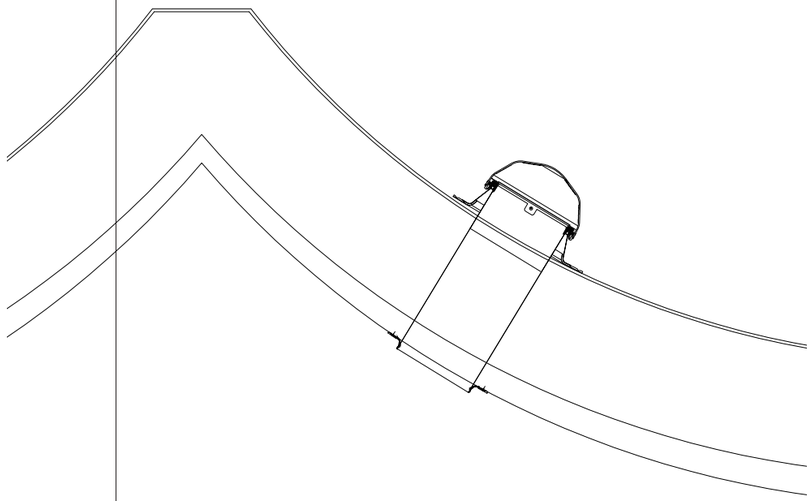
BUILDING TECHNOLOGY

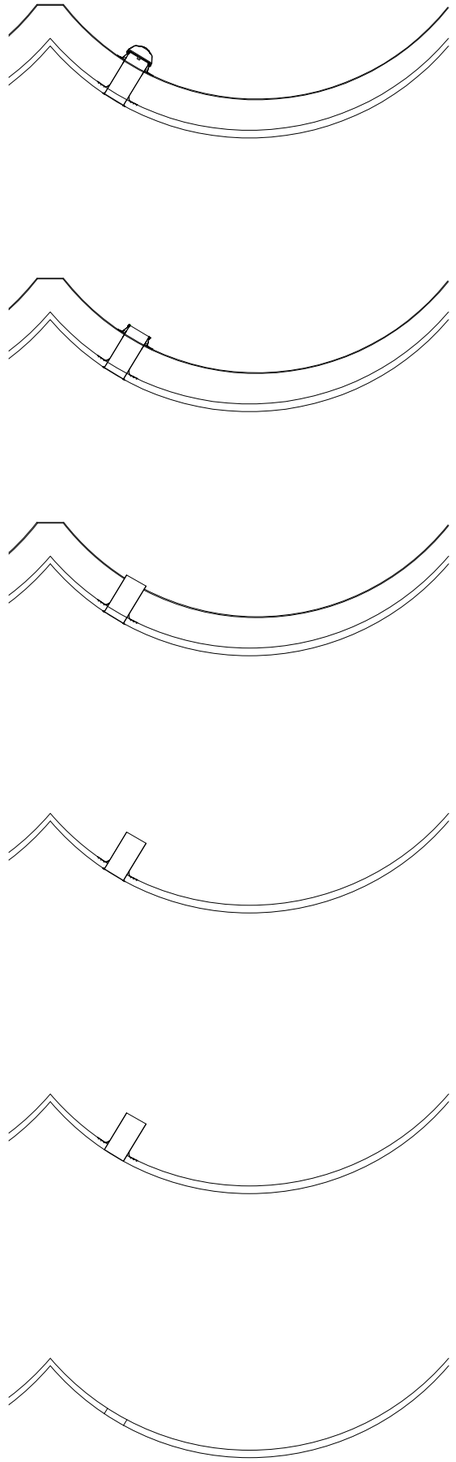
DETAIL ROOFLIGHTS

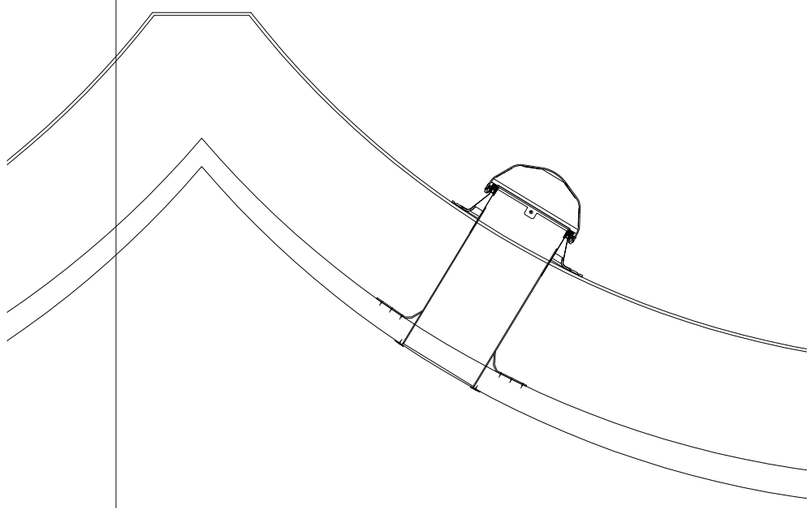
- 4 Elements needed voor rooflights:

  - Koepel
  - Dakdoorvoer met opstand 15 cm
  - Tube
  - Luchtdicht manchet



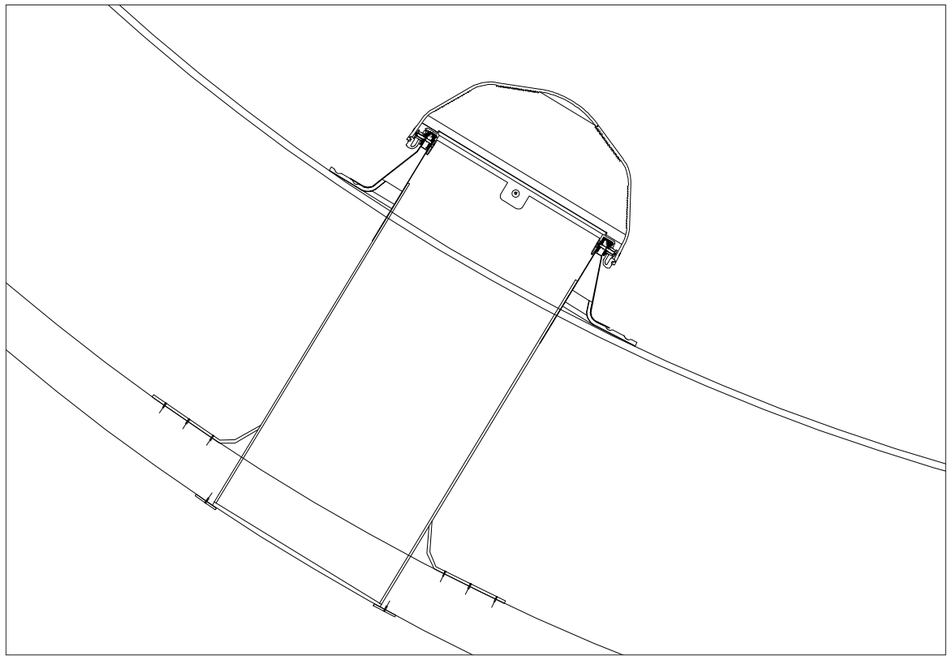


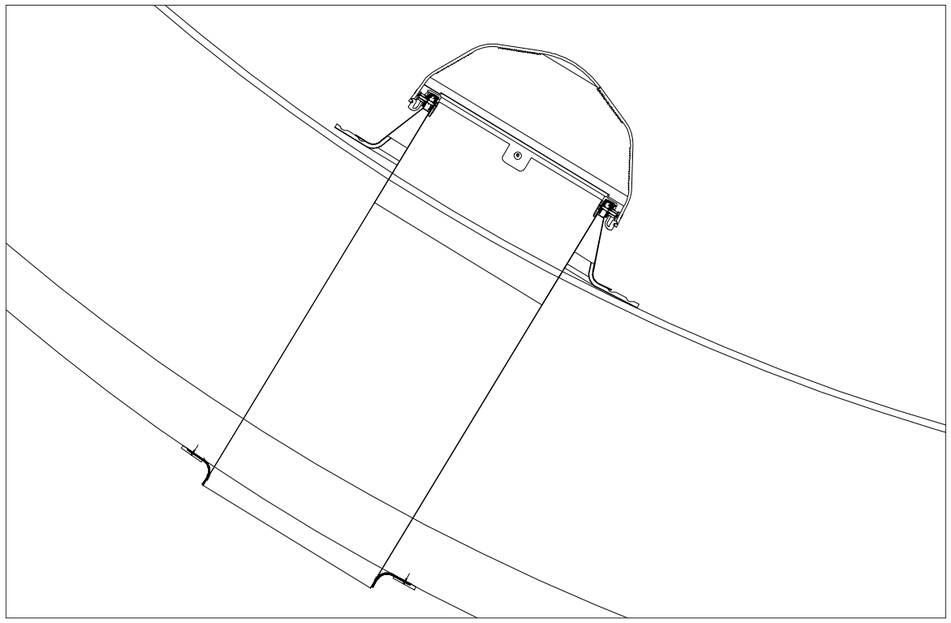




BUILDING TECHNOLOGY

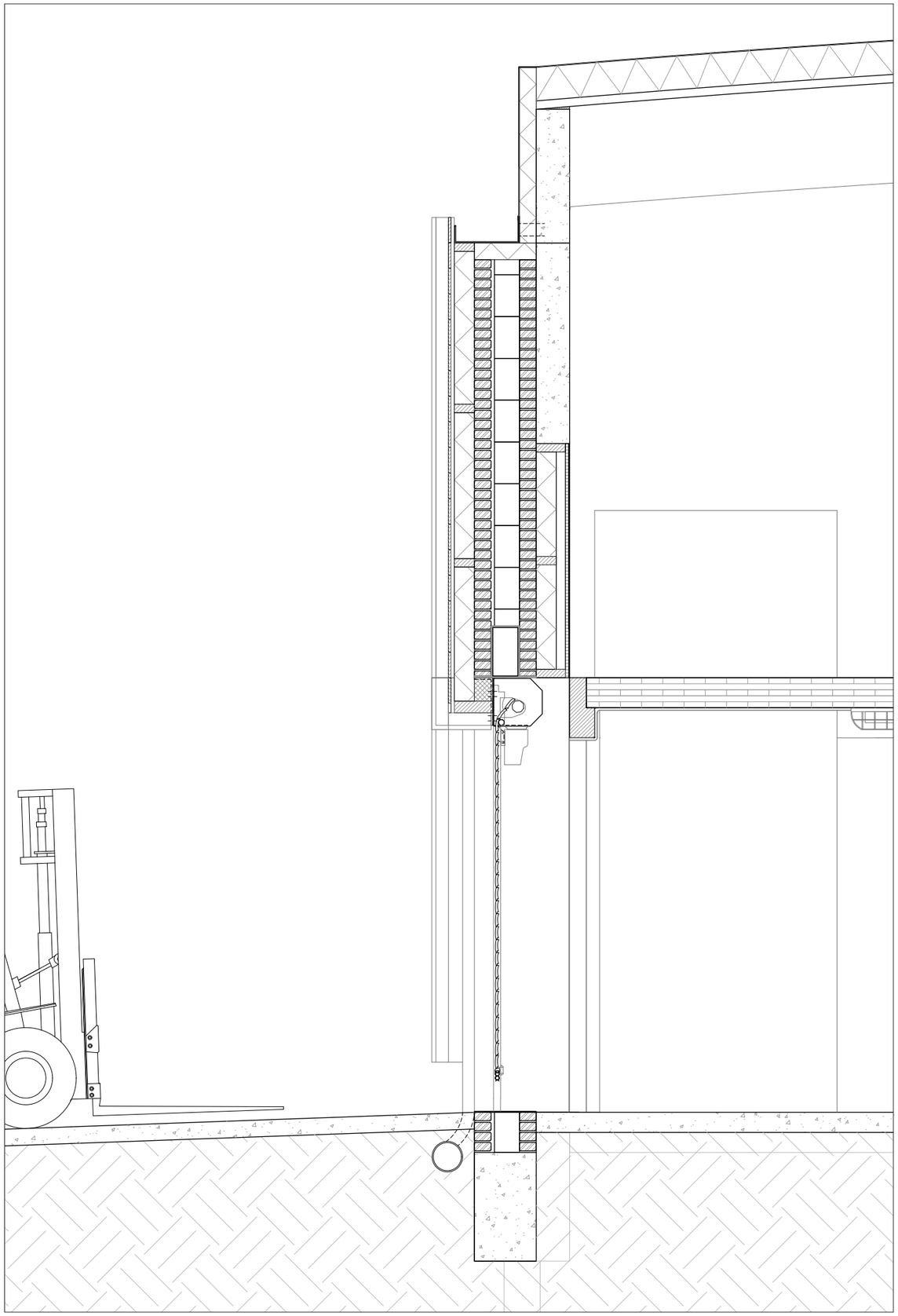
DETAIL ROOFLIGHTS





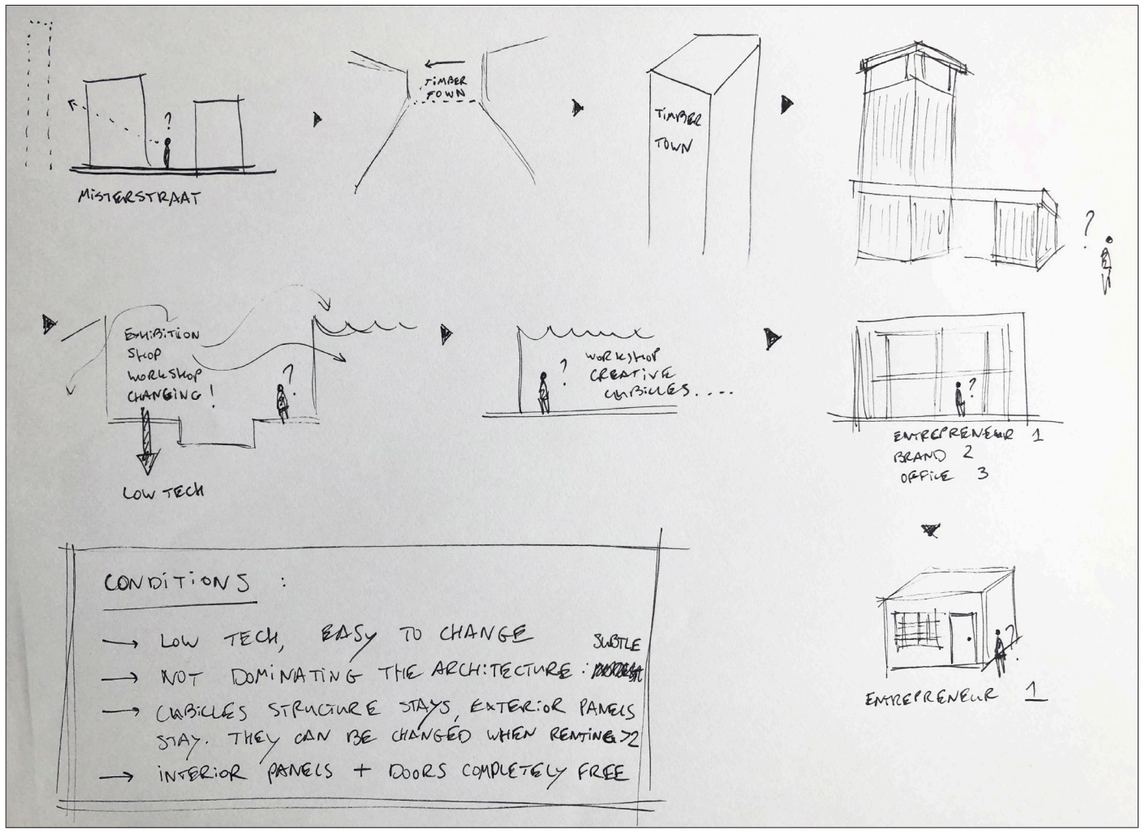
BUILDING TECHNOLOGY

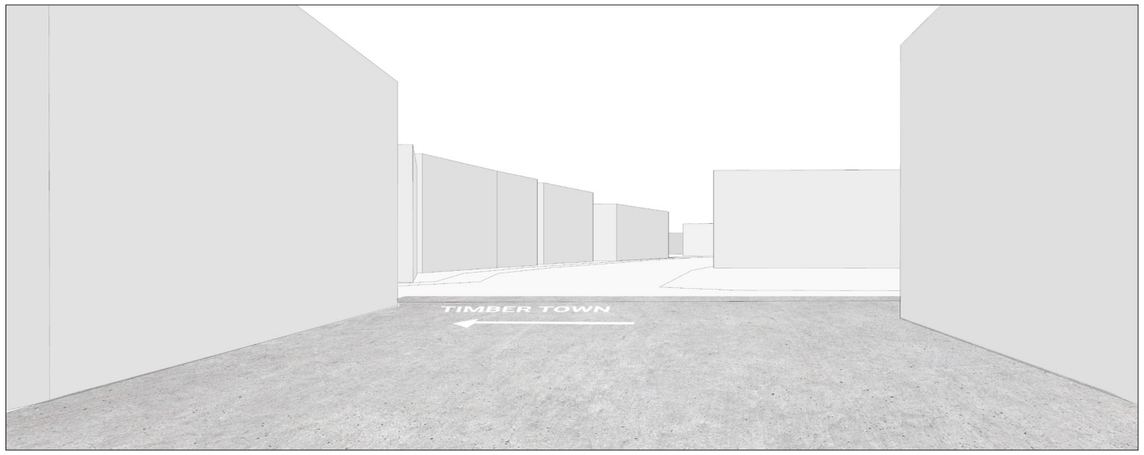
FUNCTIONALITY AND DETAILING

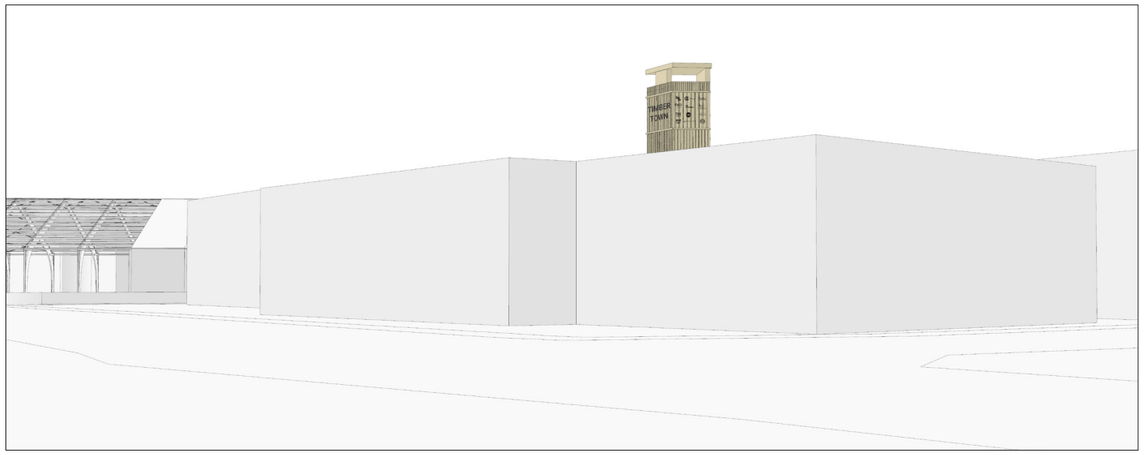


ARCHITECTURE

SIGNING AND BRANDING







ARCHITECTURE

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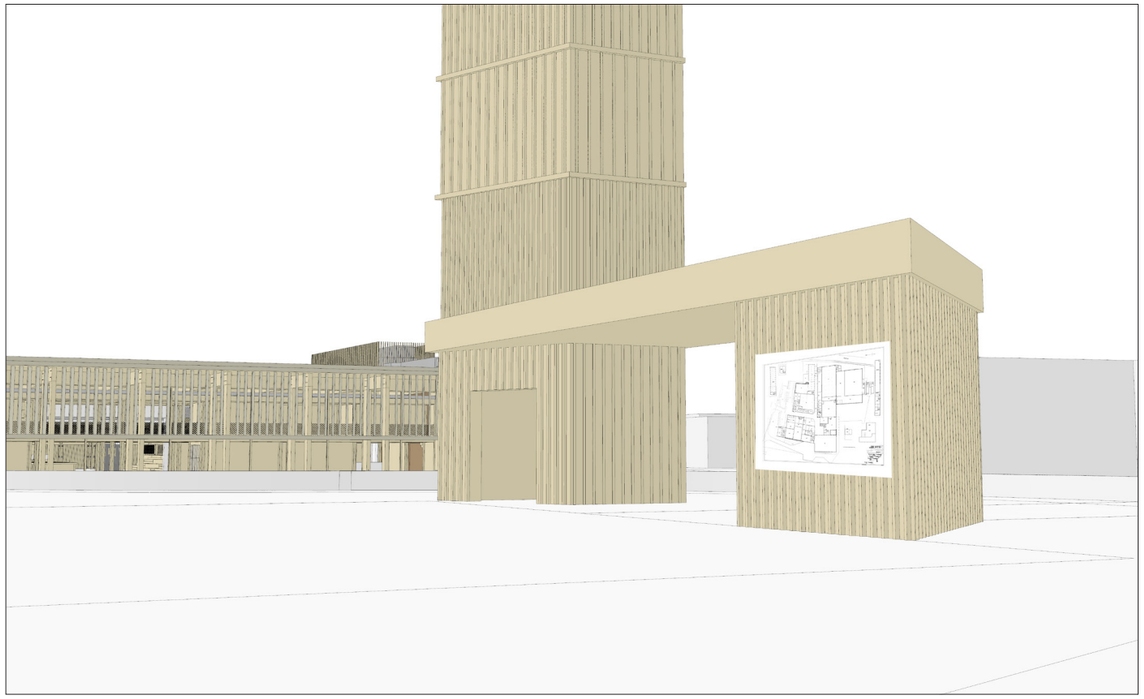

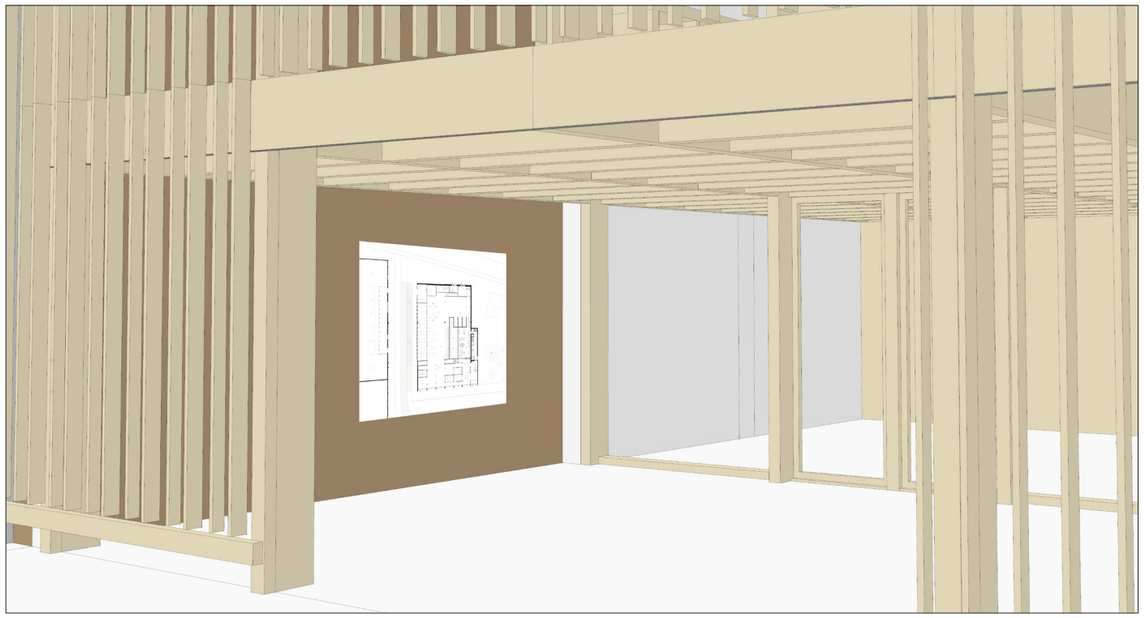

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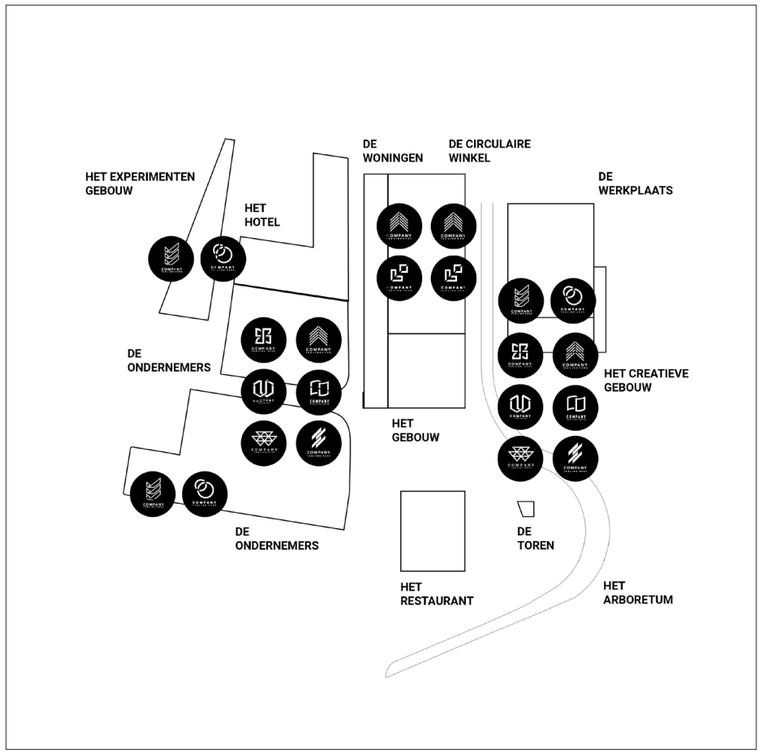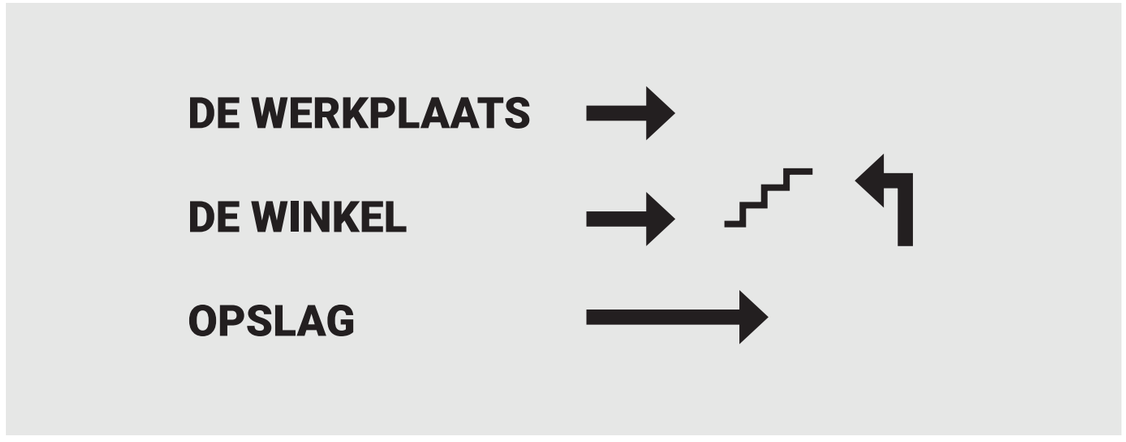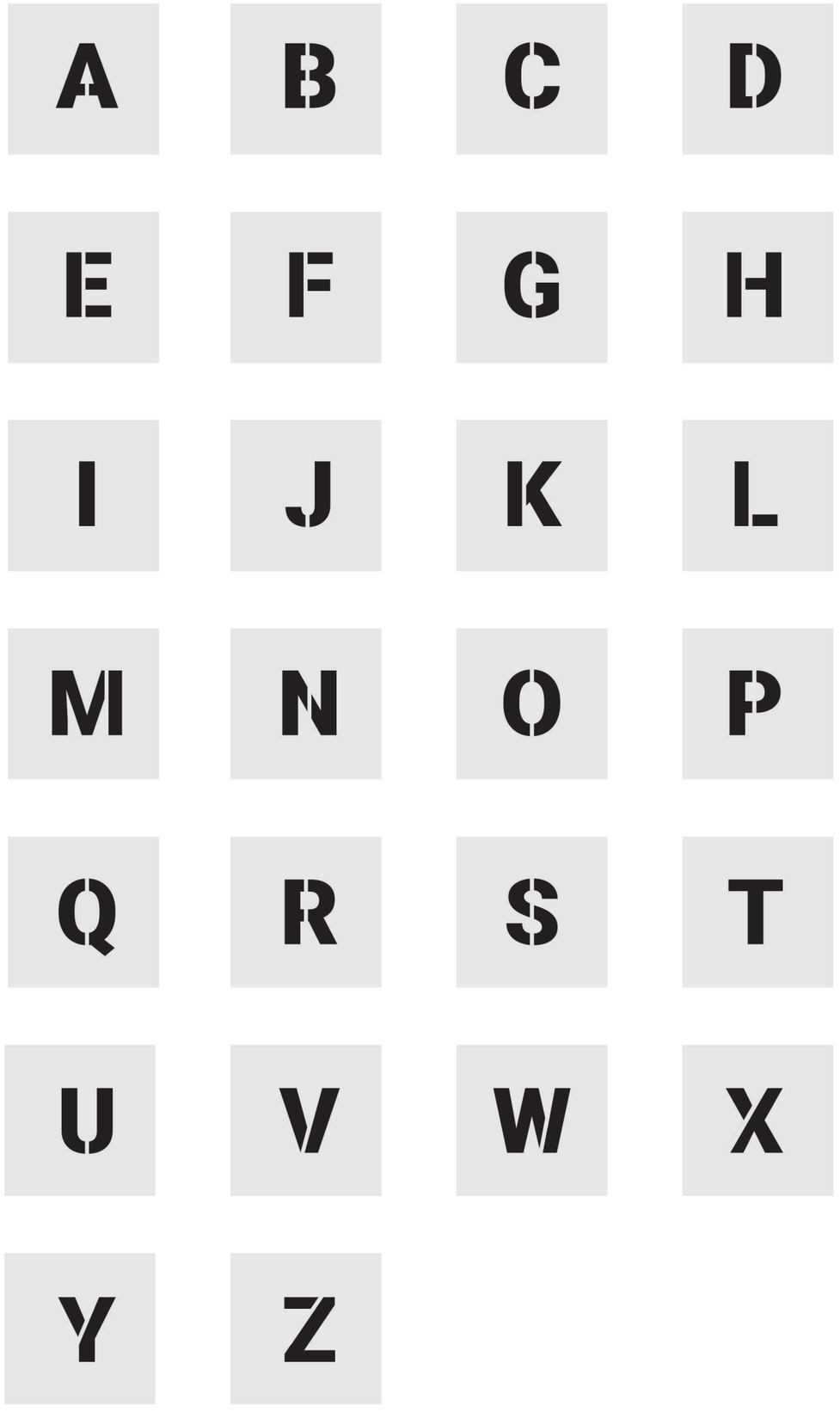
SIGNING AND BRANDING: ‘KISTLETTERS’