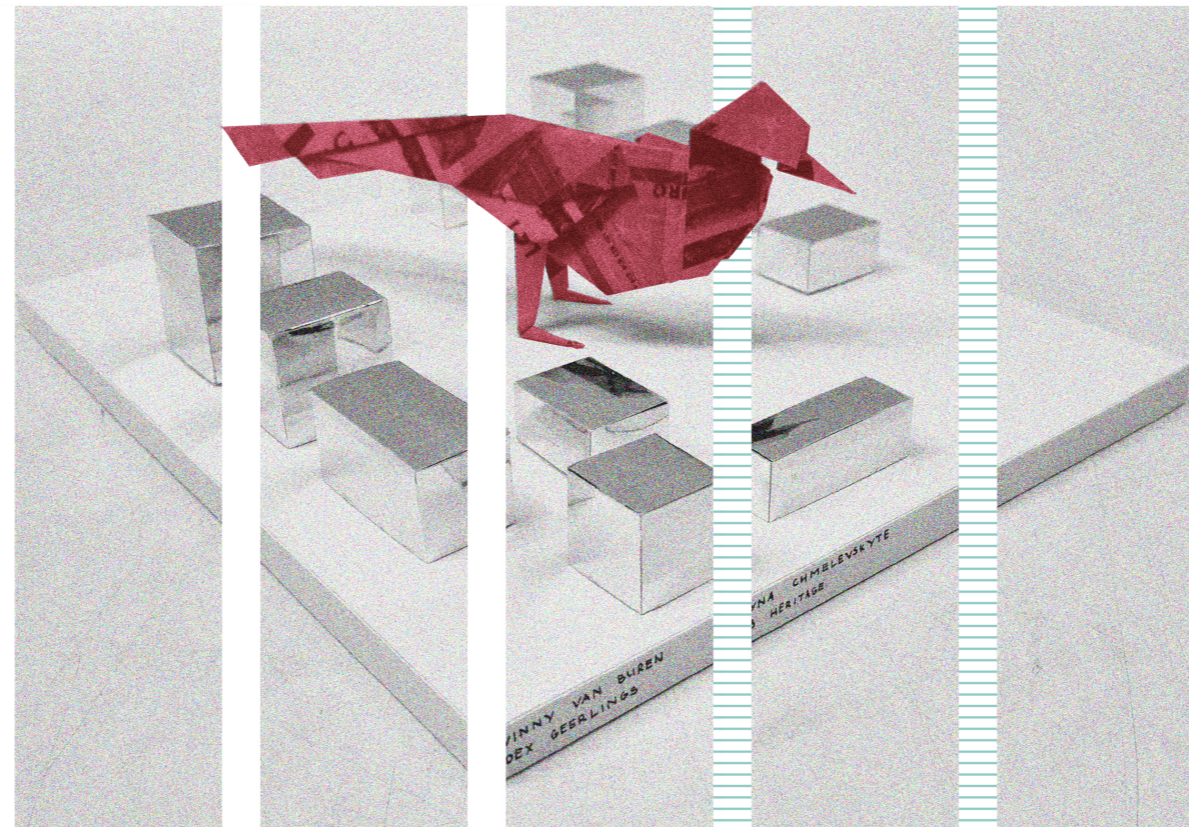


CRAFTING A NEW NARRATIVE:  
CONSUMERISM AND CRAFTSMANSHIP IN POST-WAR SHOPPING MALL

Kotryna Chmelevskyte  
5508304  
Adapting 20th Century Heritage



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## TILBURG - TEXTILE CITY

Today Tilburg is a modern and international city. Tilburg has traditionally been an important centre of the Dutch textile industry. It is for a reason that Tilburg is called Textile City.

Tilburg started as a village forming around triangular shared spaces where sheep were kept. These triangular spaces can still be seen in the urban fabric of Tilburg. At that time poor farmers decided not to sell the wool from their sheep but to weave it themselves.

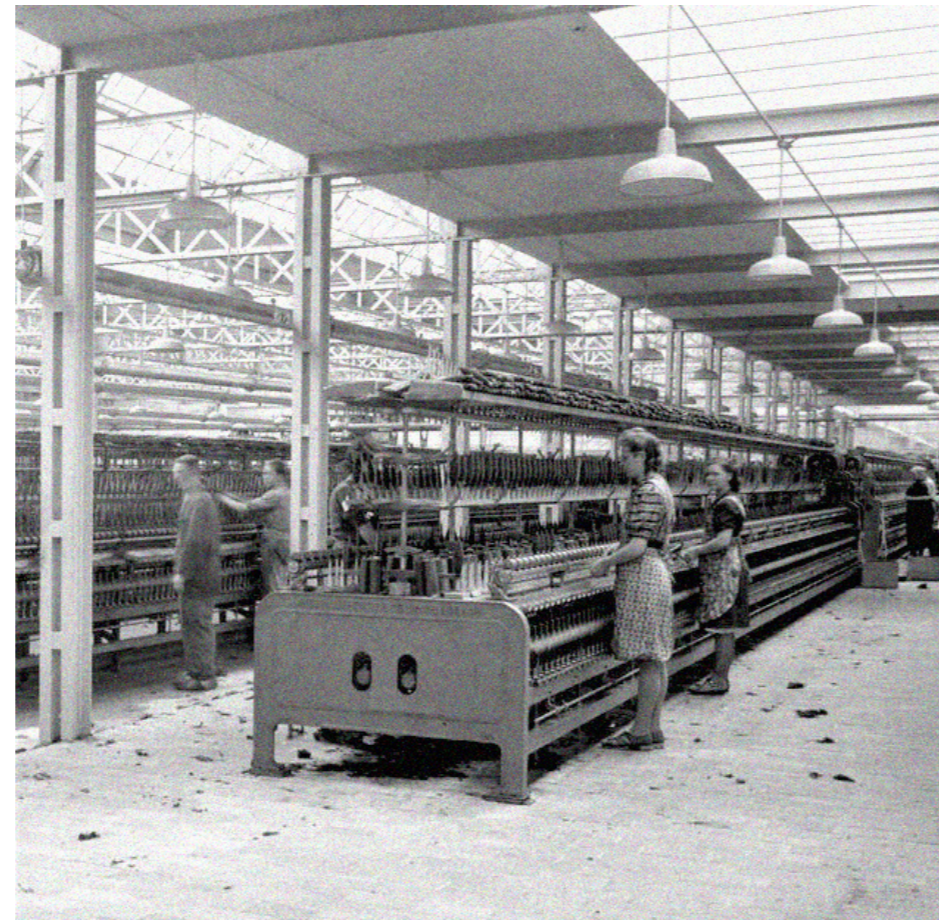
During the sixteenth century, first woollen cloth production and then linen manufacture partly moved from Den Bosch to Tilburg, Oisterwijk and Geldrop.

In 1812 there were 4,580 textile workers in Tilburg, of whom 89% home workers and 19% factory workers.

In 1950, 54% of the Dutch textile factories were still located in Tilburg and 12,765 textile workers were employed there, which was more than all other Tilburg factories combined.

After 1960, however, a change took place. The number of workers in the textile industry decreased from 10,700 to only 2,010 persons in 1977

The last wool wash in Tilburg disappeared on March 22, 1983. The Dutch Textile Museum and several industrial monuments still bear witness to the rich industrial past.



TEXTILE WAS AN IMPORTANT PART OF TILBURG'S DEVELOPMENT AND WAS ONE OF THE MAIN INDUSTRIES IN THE CITY UNTIL 1960.

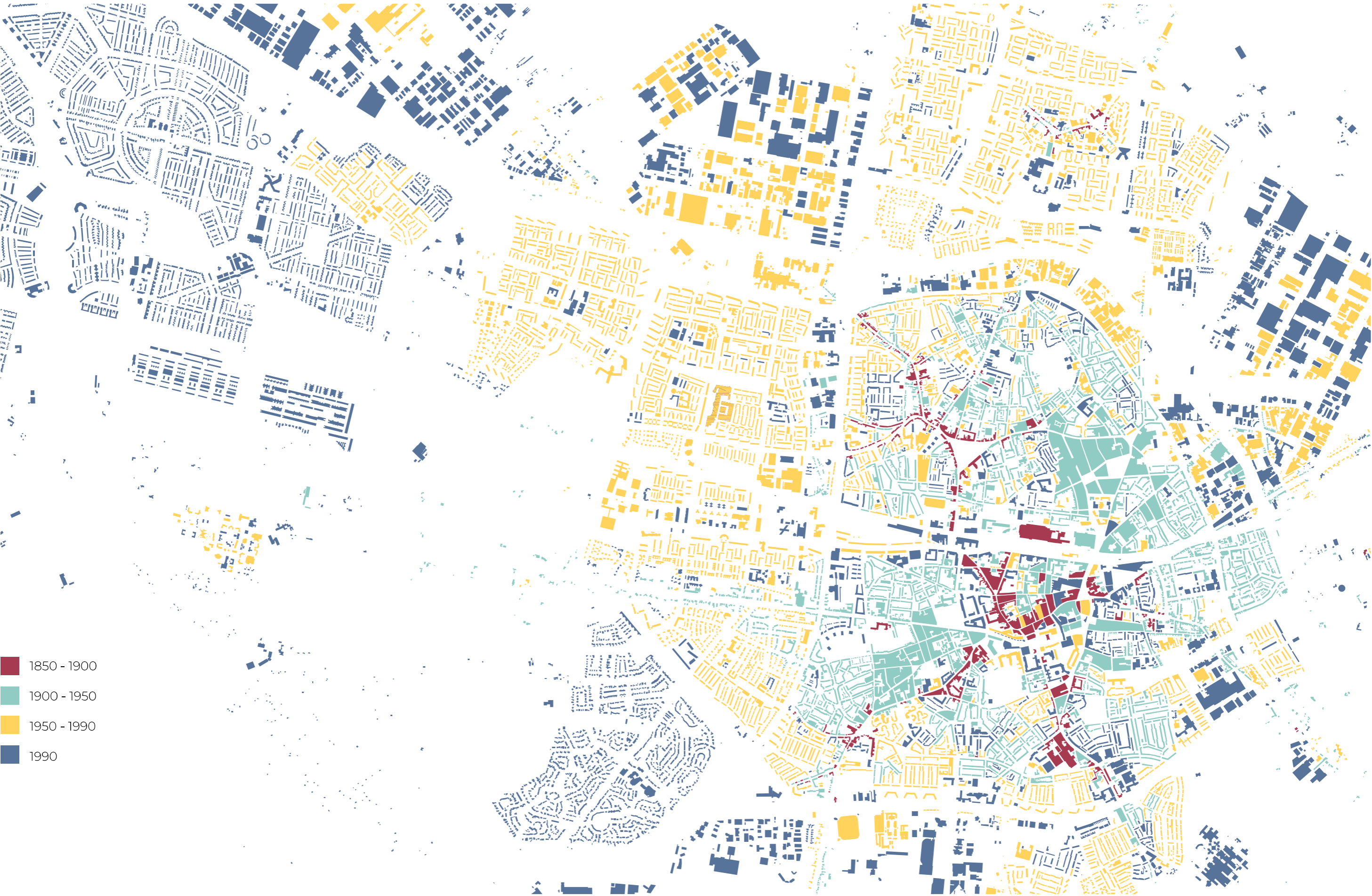
REGIONAAL ARCHIEF TILBURG, N.D.



CURRENTLY TEXTILE MUSEUM IS A POPULAR DESTINATION WHEN VISITING TILBURG

OWN PHOTO, 2023

TILBURG'S DEVELOPMENT



- 1850 - 1900
- 1900 - 1950
- 1950 - 1990
- 1990

## SOCIAL CONTEXT

### Inhabitants

Het Zand, Tilburg

#### Population

12,675

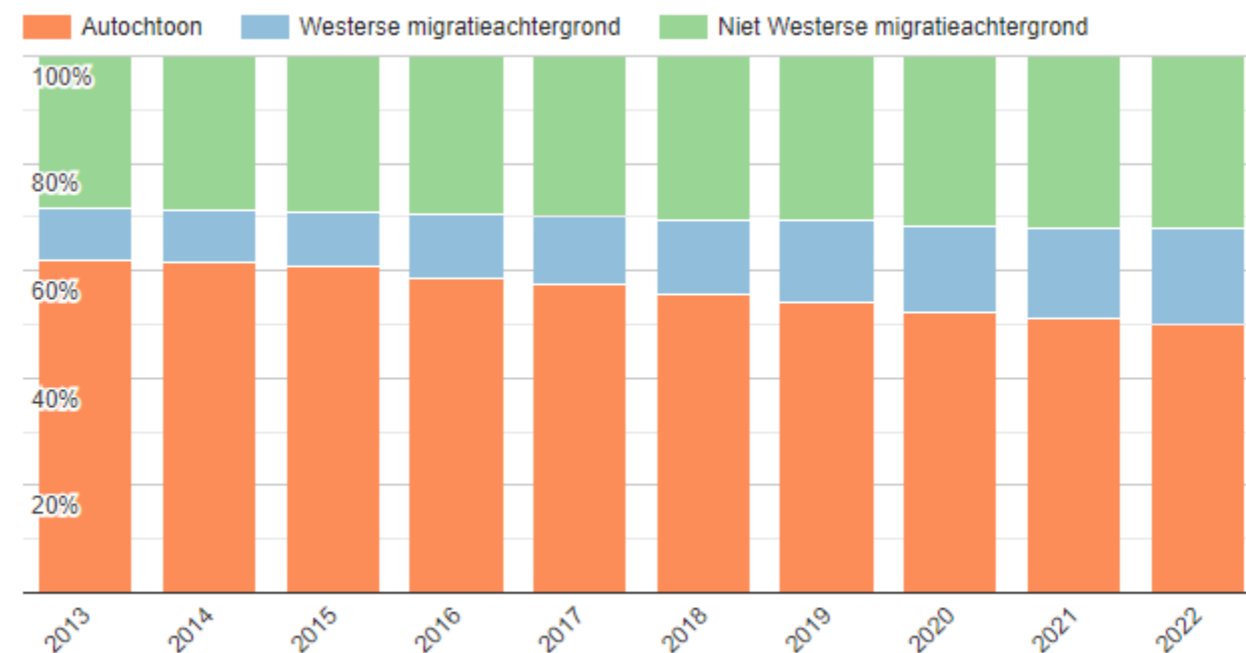
#### Ages

| The sand           |     | NL  |
|--------------------|-----|-----|
| < 15 years         | 13% | 16% |
| 15 - 24 years      | 18% | 12% |
| 25 - 44 years      | 29% | 25% |
| 45 - 64 years      | 22% | 27% |
| 65 years and older | 18% | 20% |

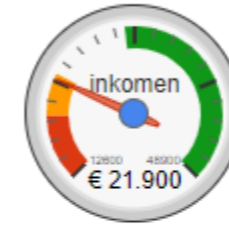
#### Households

| The sand                |     | NL  |
|-------------------------|-----|-----|
| Living alone            | 57% | 39% |
| Family without children | 21% | 29% |
| Family with children    | 22% | 32% |

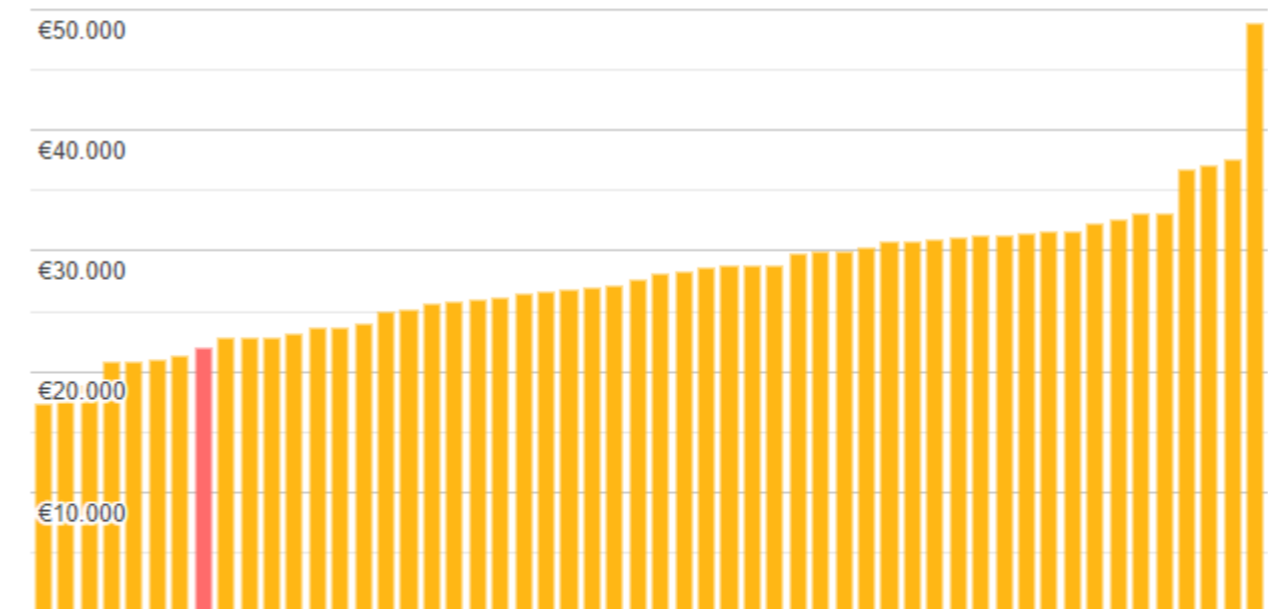
Source: CBS



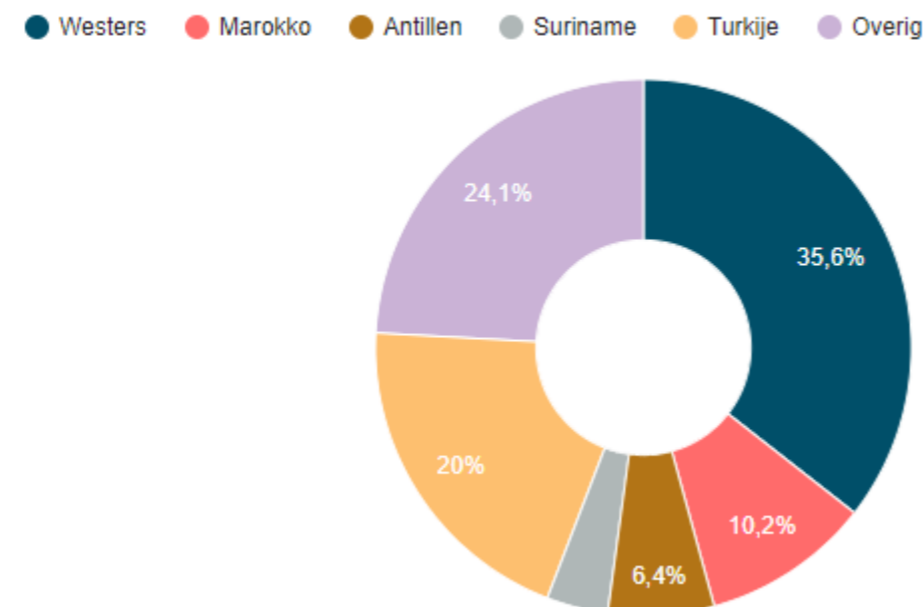
### Average income per inhabitant (€21,900) [link](#)



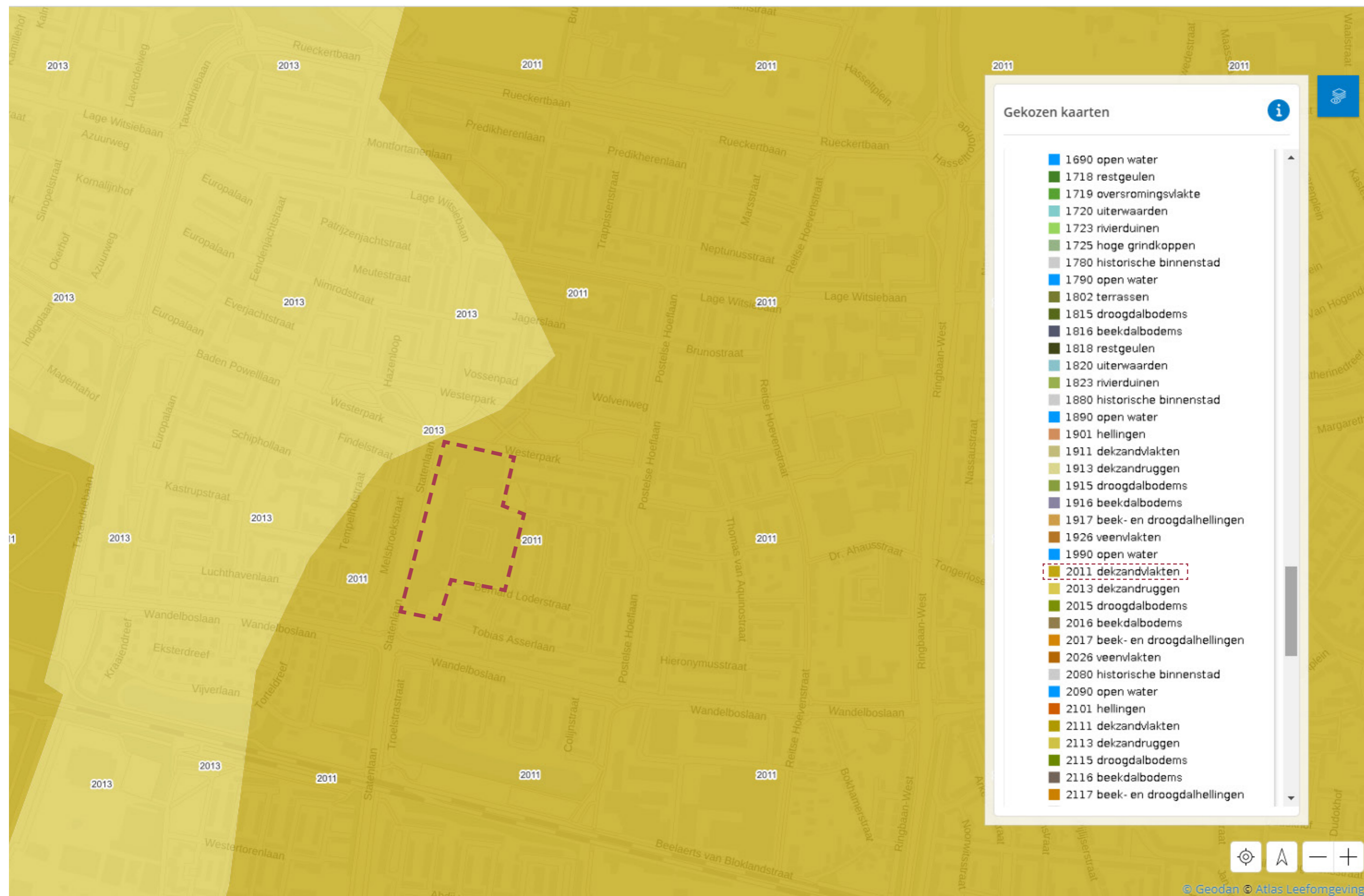
Average gross annual income in Het Zand district.



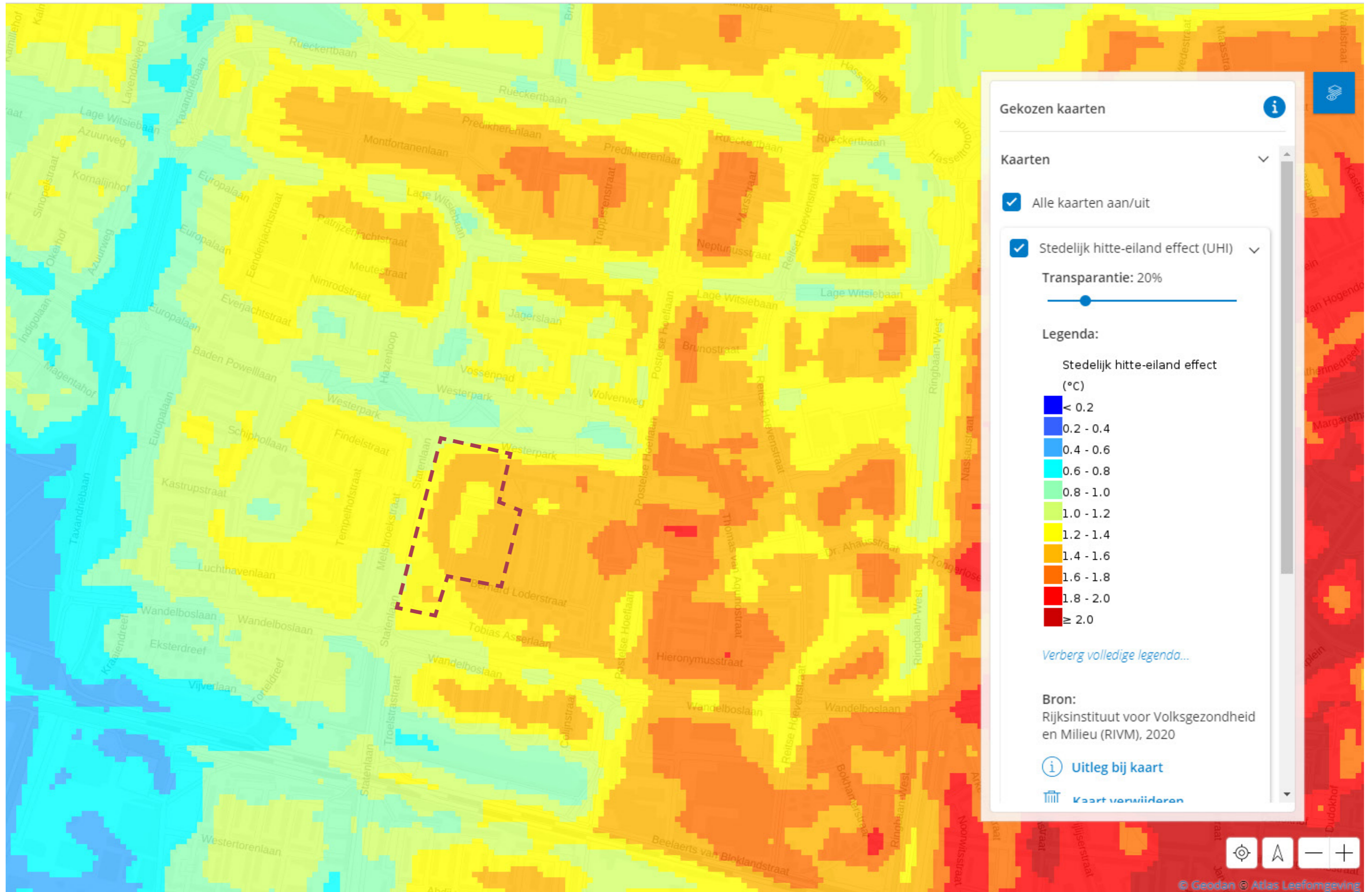
Average income per year for the neighborhoods in Tilburg (Het Zand neighborhood is red)



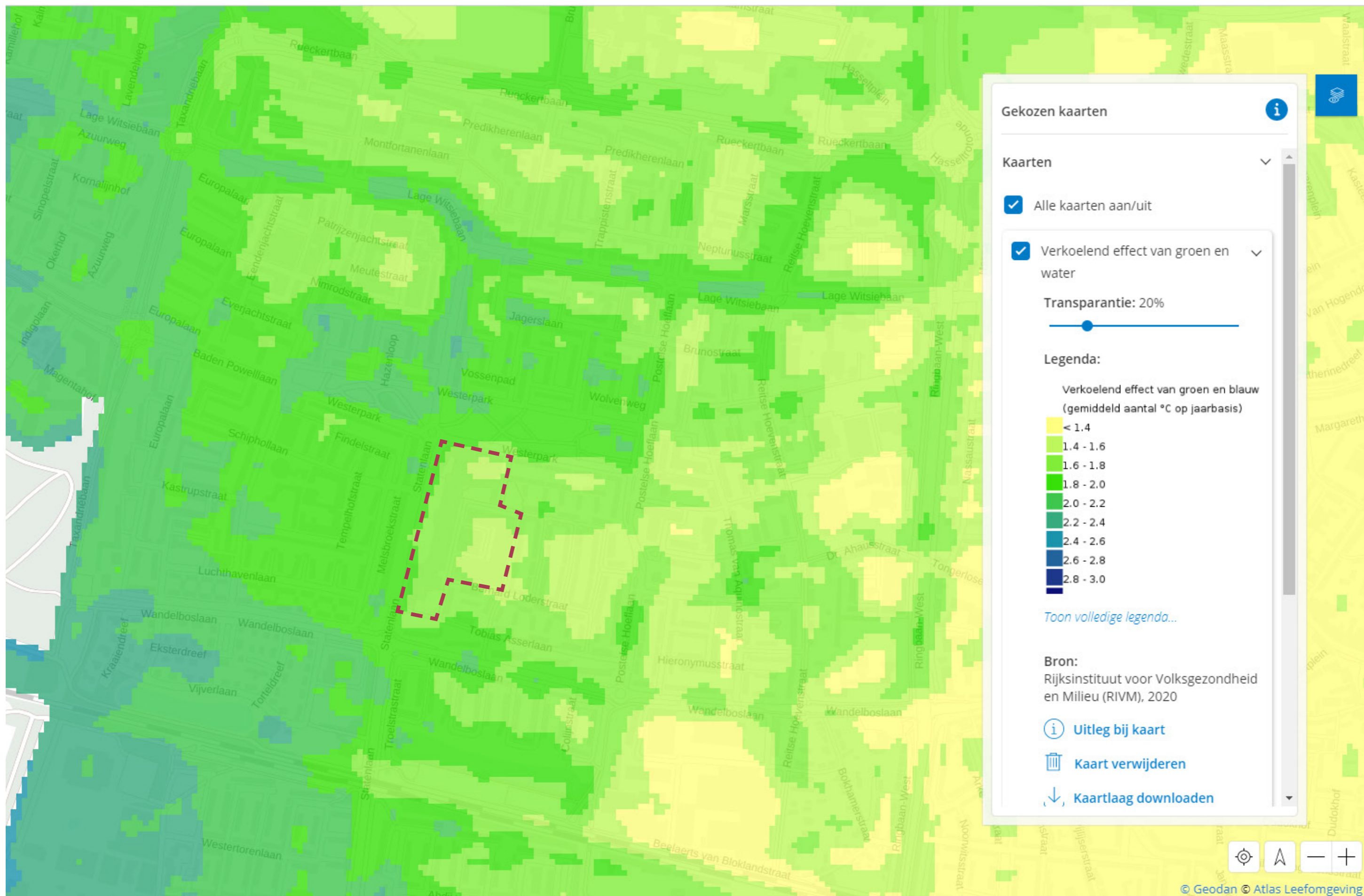
## LANDSCAPE ZONES



## HEAT ISLAND EFFECT



## COOLING EFFECT FROM GREENERY





**The four lenses**  
address both social and ecological issues, while combining the local aspirations of a place with its global responsibilities.

Let's dive in and explore these lenses one by one.

| Local  | Global   |            |
|--|--|------------|
| ECOLOGICAL CEILING   | ECOLOGICAL CEILING   | Ecological |
| How can this place be as generous as the wildland next door? | How can this place respect the health of the whole planet? |            |
| SOCIAL FOUNDATION  | SOCIAL FOUNDATION  | Social     |
| How can all the people of this place thrive?                 | How can this place respect the wellbeing of all people?    |            |
| Local aspirations  | Global responsibilities                                    |            |

|   |         |   |   |  |
|---|---------|---|---|--|
| Lens 1  |         |   |   |  |
| Local   |         |   |   |  |
| Social  |         |   |   |  |
| What would it mean for the people of Tilburg to thrive? |         |   |   |  |
|   |         | Target  | TILBURG2040 (2021) + (2015)   | SNAPSHOT   |
| Healthy   | Health  | all citizens have an equal chance of living a healthy life, regardless of socioeconomic status, or background | <ul style="list-style-type: none"> <li>Based on the idea that municipalities are closer to the residents and know better what is needed, the central government has transferred important (care) tasks to the municipalities. Better coordination and cooperation between municipalities and providers should lead to greater effectiveness and synergy. A transformation in which everyone is asked to help support others.</li> <li>By limiting the freedom of movement of the car in the network and making room for attractive walking paths and cycling routes, sports and exercise are more stimulated for residents and visitors.</li> </ul> | Healthcare in Tilburg is the largest sector when it comes to employment (18%), but the affordability of healthcare is becoming more problematic.   |
|   | housing | there is sufficient availability of affordable and decent homes   | <p>A large part of the post-war housing stock, in particular the social stock of the housing associations, has improved. The houses use less energy. And they offer - especially - the large group of seniors more comfort and space. They can live independently for longer. There are also sufficient affordable rental homes available for the target groups.</p> <p>8 000 additional houses with mix of working, sports and learning</p> <p>+25 000 homes by 2040, via densification (950 to 1500 homes per year)</p>   | <p>There are 111,851 households in Tilburg, of which 46% live in a single-person household. There are a total of 103,968 homes available</p> <p><b>It is expected that Tilburg will have a shortage of 7.031 houses in 2030</b></p>  |
|   | water   | public water is accessible, attractive, clean and safe for all users  |   | Tilburg is working on (restoring) a sustainably affordable water system, optimizing the water chain (economical and efficient use of (residual) water) and linking functions that lead to added value (increasing the recreational, ecological, economic and amenity value of water) |
|   | food    | everybody can afford a healthy diet   |   |  |

|           |                  |   |   |   |
|-----------|------------------|---|---|---|
| Connected | Connectivity     | citizens and municipality are interconnected  | Citizens are also active through the many citizens' initiatives and cooperatives. Citizens and social organizations are thus the fourth partner in many partnerships. The municipality is committed to a partner strategy: varying forms of cooperation and alliances for various tasks.                                  | 94% of households now have an internet connection in Brabant  |
|           | Community        | Tilburg is inclusive and has strong communities   | <ul style="list-style-type: none"> <li>• create urban communities with shared spaces and facilities that contribute to a sense of community</li> </ul>  | <p><b>besides campus there are hardly any pleasant places to meet</b></p> <p>local residents indicate that the contacts in the neighbourhood are insufficient</p> |
|           | Mobility         | city is accesible to everyone via public transport in a safe and sustainable way                        | <ul style="list-style-type: none"> <li>• Tilburg university station becomes intercity station</li> <li>• 4,000 additional travelers per day in the foreseeable future.</li> <li>• more homes and workplaces within 0.5 - 1km from the station</li> <li>• more freedom for pedestrians and cyclists, fewer cars</li> </ul> | Tilburg University station has about 7,000 boarders and alighters every day.  |
|           | Culture          | all citizens can engage in high-quality cultural activities   | attractive environments that invite encounters and the exchange of knowledge and ideas  |   |
| Empowered | Peace n' justice | tilburg is safe and liveable city for residents and visitors  |   | 135 crimes per month in Tilburg.<br>1102 crimes in Het Zand per year  |
|           | Social equity    | citizens enjoy greater independence and seldom experience inequality of opportunity                     | There is also an eye for vulnerable citizens in the city. They are encouraged and, where necessary, helped to participate in society and to develop within their possibilities. Companies and institutions also hire people with disabilities and allow them to participate in the labor process.                         |   |
|           | Political voice  | citizens have an increased say, involment and role in deciding what happens and how it gets implemented | The government no longer determines from above what needs to be done, but is one of the partners in completing the necessary social challenges and solutions  | residents have indicated that they do not always feel heard or seen   |

|         |                       |   |  |  |
|---------|-----------------------|---|--|--|
|         | Equality in diversity | Tilburg is ethnically inclusive   | Tilburg wants to be an undivided inclusive city in which there is room for everyone. A city of homogeneous neighborhoods in heterogeneous neighbourhoods.  |  |
| Enabled | Jobs                  | citizens are provided with attractive commercial facilities throughout the city, and entrepreneurs benefit from a good business climate | <p>lively, dynamic and inclusive living-working area with strong economic profile in knowledge-intensive services, offices and business services</p> <ul style="list-style-type: none"> <li>• The growth in the number of selfemployed persons is leading to a greater demand for smaller-scale types of offices, different and flexible office concepts (meeting offices) and options for working from home.</li> </ul> | <ul style="list-style-type: none"> <li>• current unemployment 52.7 per 1000 people in Tilburg</li> <li>• total of 240 companies and institutions are located in the area, which together provide more than 4,000 jobs.</li> <li>• Three-quarters of the jobs are related to education</li> <li>• there is hardly any attraction for knowledge-related institutions or industry, besides existing educational facilities</li> </ul> |
|         | Income                | financial security is assured for citizens who cannot provide for their own livelihoods   |  | 3.9% of people are at risk of poverty in Tilburg<br>knowledge quarter has higher than average score of poverty households  |
|         | Education             | good education in high-quality school environment   | students want to continue to be associated with the city after their studies, both socially and economically.  |  |
|         | Energy                |   | stop using natural gas by 2050   | current household energy consumption 2770kWH<br>A energy class houses make 27% of all houses   |

| Lens 2   |  |   |
|--|--|---|
| Local  |  |   |
| Ecological   |  |   |
| What would it mean for Tilburg to thrive in its natural habitat? |  |   |
|  | TILBURG 2040   | SNAPSHOT  |
| Water provisioning (renewable water resources)                   | The basic principle is that the collected rainwater within each initiative is retained and stored in the area where it falls. This means that the rainwater does not disappear into the sewer system, but as much as possible into visible water management that contributes to the ecological and landscape improvement of the living environment.  | <ul style="list-style-type: none"> <li>· The backbone of the water system is formed by the blue veins in the area. These veins flow from two directions to the ponds near Tilburg University Station. These existing ponds will be restored as rainwater buffers and converted into a water park. A number of neighborhoods next to the blue veins are linked to this drainage system.</li> <li>· For all building initiatives, the rainwater requirement is 60 l/m² on the surfaces that drain water;</li> </ul> |
| temperature regulation (heat island effect)                      | <ul style="list-style-type: none"> <li>· By opting for a robust green-blue network, Tilburg wants to limit heat stress. The network breaks through potential heat islands and gives room for the wind to ventilate the city.</li> <li>· there will be room for sufficient cooling places. These are green spaces with a minimum size of 200 by 200 metres, with space for water storage, cooling and evaporation.</li> </ul> | The grid pattern of this network is already present in this part of the city, but now consists of a lot of pavement   |
| energy harvesting  | The challenge is to use as much of the existing roof surface as possible to install solar panels, so that energy is not only generated for our own building, but also for the rest of the city.  | <p>currently renewable energy makes 12.4% of consumed energy.</p> <p>There are 16 271 registered PV panels that make 54 038kW</p>   |
| biodiversity support   | the municipality wants to install stepping stones between different core areas, in particular for butterflies and small mammals. There must also be sufficient linear green along the track that can fulfill a connecting function for bats. Finally, the municipality of Tilburg wants to create small habitats for breeding birds.   | Biodiversity in the Netherlands, measured in terms of the quality and quantity of nature, has declined to approximately 15% of the original situation (1700-2010). The loss of biodiversity is therefore considerably greater than elsewhere in Europe and the world  |
| carbon sequestration   | CO2-neutral built environment in 2050. The municipal objective is a climate-neutral Tilburg in 2045.   | <p>tilburg releases 977200T of CO2 per year</p> <p>Because of the soil conditions, Brabant is an attractive area for using the subsurface for CO2 storage and geothermal energy</p>   |
| waste generation   | <p>fully circular municipality by 2045</p> <p>New construction must work with the points system Nature Inclusive Building; In new construction, we will focus on circular construction</p>   | 134kg of household waster per year  |

| What would it mean for Tilburg to respect the well-being of people world-wide? |   |   |
|--|---|---|
| Case of textile  | Global target   | Global status   |
| SDG1 - no poverty  | The fashion industry must play an active part in improving the economic livelihoods of the communities in which it operates, by paying fair and equal wages to all its employees and ensuring that no one within the supply chain is living beneath the poverty line.   | <ul style="list-style-type: none"> <li>· only 4% of the price of a garment goes to the person who makes it</li> <li>· 93% of brands don't pay their workers a living wage, forcing laborers to work 14-16 hours a day seven days a week</li> </ul>  |
| SDG3 - good health and well-being  | Health and safety regulations in textile and garment factories should be strictly audited by third party authorities. In addition, there should be further legislation on toxic chemicals and pollutants being used and disposed of by manufacturers which threaten the health of those using nearby water sources. |   |
| SDG4 - quality education   | Iso, companies operating in disadvantaged communities should actively endeavour to create and sustain educational opportunities like work-related training qualifications, and should also ensure all employees are able to earn enough money to send their families to school and afford quality childcare.        | <ul style="list-style-type: none"> <li>· An estimated 170 million children are engaged in child labour, or 11% of the global population of children, according to the International Labour Organisation . These are children who are being deprived of receiving a basic education that will allow them to progress in the future.</li> </ul> |
| SDG 5 - gender equality  | We need to ensure women are able to reach and sustain executive positions in fashion, like creative directors and CEOs. Sexual harassment in areas of the fashion industry such as including modelling, also needs to be addressed and targeted.  | About 75% of the more than 60 million garment workers are women. Most of these workers find themselves in situations of insecurity aggravated by extremely low wages, forced overtime, child labor, pregnancy discrimination, as well as physical and verbal abuse.   |
| SDG8 - decent work and economic growth   | From dangerous working conditions to workplace discrimination, exploitation exists across all levels of the fashion industry in a variety of shapes and forms. Companies should formalize respectful working conditions with policies that adhere to universal human rights.  | Since 2005, at least 1800 garment workers have been killed in factory fires and building collapses in Bangladesh alone  |

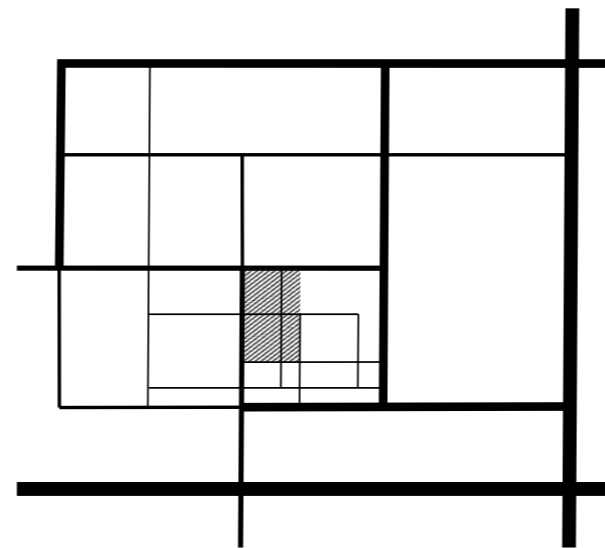
| Lens 4  |   |
|---|---|
| Global  |   |
| Ecological  |   |
| What would it mean for Tilburg to respect the health of the whole planet? |   |
|   | snapshot  |
| climate change  |   |
| air pollution   | tilburg - 977.200T of CO2 per year  |
| ozone layer depletion   | -   |
| excessive land use  | The amount of land required worldwide for Dutch consumption in 2013 was around two and a half times the area of the Netherlands |

|                          |  |
|--------------------------|--|
| waste generation         | 134kg of waste per household per year  |
| freshwater withdrawals   | The Netherlandshas the highest water footprint in Europe, with almost 90% of total water consumpton embedded in imports such as meat, cotton and food  |
| biodiversity loss        | Biodiversity in the Netherlands, measured in terms of the quality and quantity of nature, has declined to approximately 15% of the original situation (1700-2010). The loss of biodiversity is therefore considerably greater than elsewhere in Europe and the world |
| excessive fertilizer use | The dutch agricultural sector is responsible for 61% of the total amount of nitrogen emissions, mainly caused by fertilizers   |
| ocean acidification      | -  |
|                          | Due to the growth of the world population and the world economy, the global demand for materials, energy, food and water will increase sharply in the coming decades. Without additional policy, global energy use is expected to increase by 60 to 80% by 2050      |

VISION

| Local Social                                       |  |  | Local Ecological   |  |
|--|--|--|--|--|
| How could Westermarkt benefit the local community? |  |  | How could Westermarkt lower its impact on local environment? |  |
|  | GOALS  | Current situation  |  | GOALS  |
| Jobs   | <ul style="list-style-type: none"><li>· support local businesses by creating a qualitative environment that would attract people and increase footfall</li><li>· create quality spaces for entrepreneurs, thus attracting students to stay after finishing their studies</li></ul> | <ul style="list-style-type: none"><li>· There are currently 89 retail places in Westermarkt, from which 13 are vacant (vacancy rate 14.6%)</li></ul> | Water provisioning (renewable water resources)               | rainwater collection, recycle and reuse.                                       |
| Health   | <ul style="list-style-type: none"><li>· keep Thebe (district nursing, treating old and young people)</li><li>· provide quality green places for relaxation and exercise</li></ul>  | There is Thebe. However, the building is pretty small and outdated (Energy class F)  | air quaiity regulation                                       | use of local / recycled materials minimizing the CO2 amount due to import      |
| Housing  | <ul style="list-style-type: none"><li>· provide additional affordable housing for people with lower income</li><li>· provide student housing</li></ul>   | The apartments there are around 80m2. Area lacks more smaller and affordable houses.   | temperature regulation (heat island effect)                  | reduce the amount of pavement/asphalt, add more greenery<br>add water features |
| Food   | <ul style="list-style-type: none"><li>· create community gardens where people could grow organic food</li></ul>  |  | energy harvesting  | use as much of roof surface for PV panels as possible.                         |

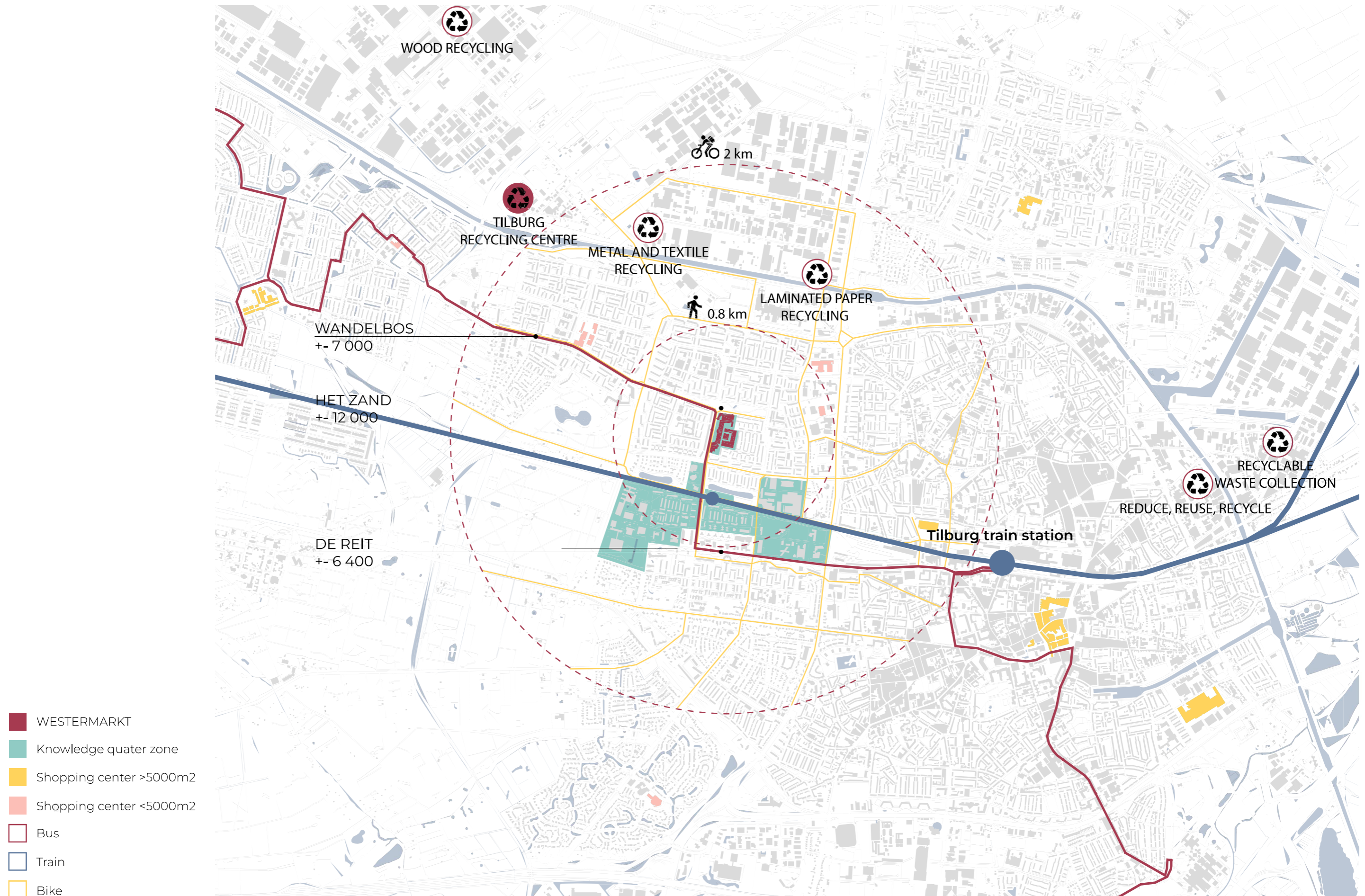
|                  |   |   |                      |   |
|------------------|---|---|----------------------|---|
| Mobility         | <ul style="list-style-type: none"> <li>· add more facilities for bikes (storage, repair...) to encourage cycling</li> <li>· add essential urban functions (according to 15-minute city) to discourage long-distances commuting and usage of car</li> </ul>  | <ul style="list-style-type: none"> <li>· The area is surrounded by parking.</li> <li>· The connection between front and back is complicated due to car traffic.</li> <li>· Westermarkt becomes a barrier when it closes down</li> </ul> | biodiversity support | ponds supporting amphibians<br>greenery for insects<br>bat houses?<br>Dense trees for nesting |
| Culture          | <ul style="list-style-type: none"> <li>· add a communal workshop as a place for people to exchange their knowledge</li> <li>· keep the 2nd hand bookshop</li> </ul>   | <ul style="list-style-type: none"> <li>· there are no cultural facilities except for bookshop</li> </ul>  | erosion protection   |   |
| Peace n' justice | Reduce criminal rates through community engagement  | <ul style="list-style-type: none"> <li>· Het Zand has a high criminal rate</li> </ul>   | carbon sequestration | ?   |
| Education        | <ul style="list-style-type: none"> <li>· provide a space for people to learn crafts</li> </ul>  |   | waste generation     | recycling materials.<br>Use of natural materials.<br>Possibility of repairing your items      |
| Energy           |   | <ul style="list-style-type: none"> <li>· Most of houses are not energy-efficient.</li> <li>· There are no PV panels or other renewable energy sources in use.</li> </ul>  |                      |   |
| Community        | <ul style="list-style-type: none"> <li>· create qualitative public space free of cars</li> <li>· add more catering facilities, creating a possibility to sit and chat or strengthen the environment of existing ones</li> <li>· create a place for neighbours to meet. For ex: shared facilities</li> </ul> | <ul style="list-style-type: none"> <li>· Currently the place lacks qualitative public spaces to sit;</li> <li>· There are no place to meet your neighbours</li> </ul>   |                      |   |



URBAN BLOCK

SHOPPING CENTER WESTERMARKT

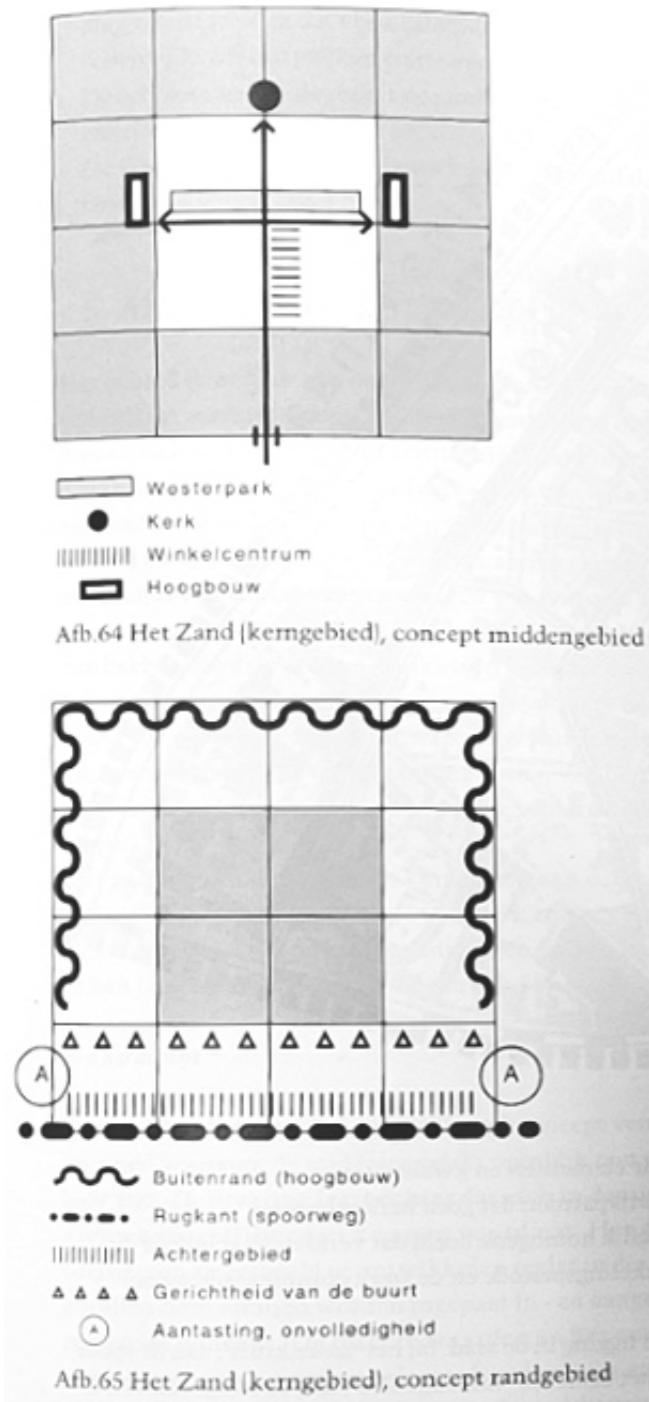
## PUBLIC TRANSPORT



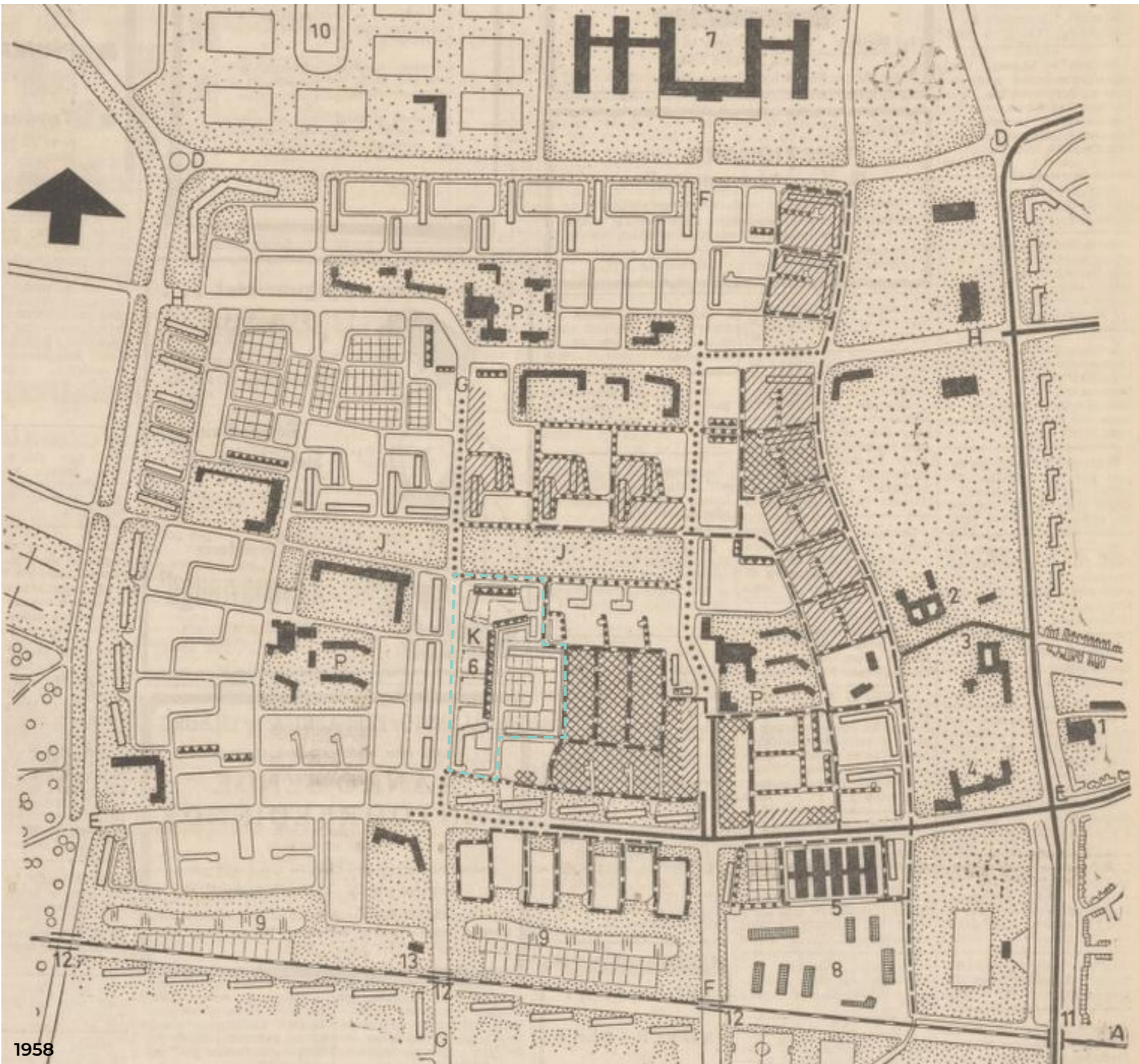
HET ZAND

In 1957-1958, Tilburg's city council announced plans for the new district with 1200 single-family homes, 750 flats and 47 local shops ("Plan't Zand, het nieuwe Tilburg", 1958). The new plan also included a shopping and care center (Westermarkt) for the entire district.

Het Zand urban pattern can be characterized by central area and two main axis. The shopping center Westermarkt is adjacent to these axis, which is accentuated by high-rise buildings, forming a central orientation element in the district (Doevendans, Luiten, Rutgers, Van Wylick Architecten, 1996).



SOURCE: DOEVENDANS ET AL., 1996



HET ZAND FUNCTIONS



## WESTERMARKT - HISTORY

In 1957-1958, architect Jan Strik designed Westermarkt complex - a combination of modernist style residential houses and retail on the ground floor. At first, it was envisioned to have 60 shops there, later the number was reduced to 40. The new complex was planned to surround 90x45m market square and a 2nd smaller square with cafe-restaurant, cinema, building with public services and specialty shops. The plan for cinema was later changed, as it was believed that the cinema will not be feasible. ("Wijziging centrum 't Zand", 1958)

In 1959, the construction of this shopping center started.

In 1961, the modern shopping center was opened. The crowds were initially concentrated at the well-equipped, well-arranged AH and Spar supermarkets and self-service store De Gruyter ("Ondanks modderige wegen", 1961).

In 1963, the highest building of the complex, designed by J. Schijvens, was finished. The building included 48 flats and a retail space for Vendet department store ("Hoogste punkt bereikt", 1963).

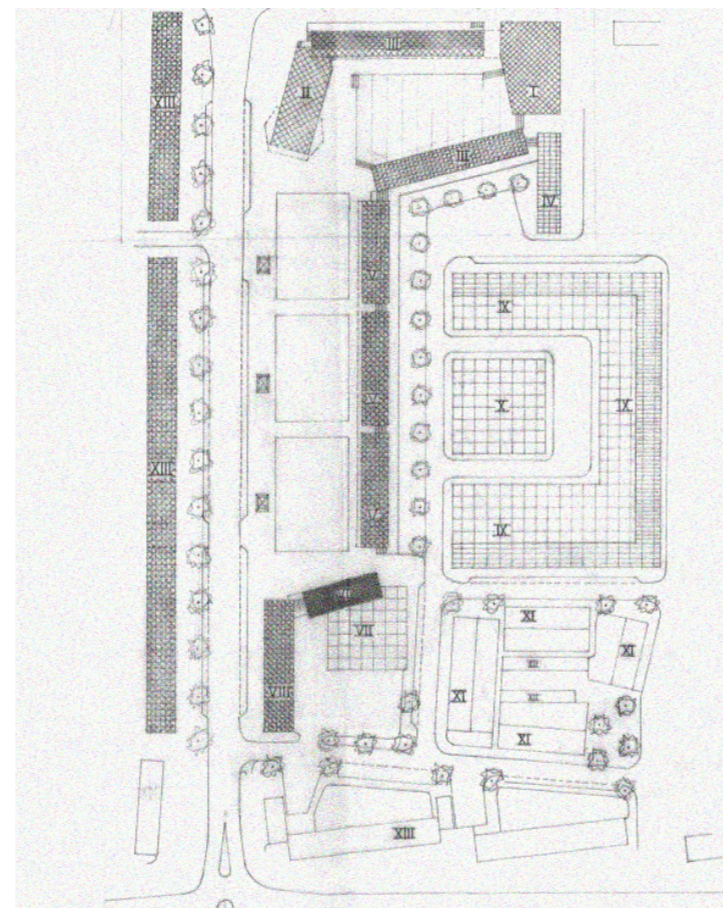
Currently, Westermarkt shopping center forms the shopping facilities heart of a large part of Tilburg. The shopping center measures approximately 25,000 m2 of floor space, has two large supermarkets and has a catchment area that is much larger than Het Zand, the neighborhood in which it is located.



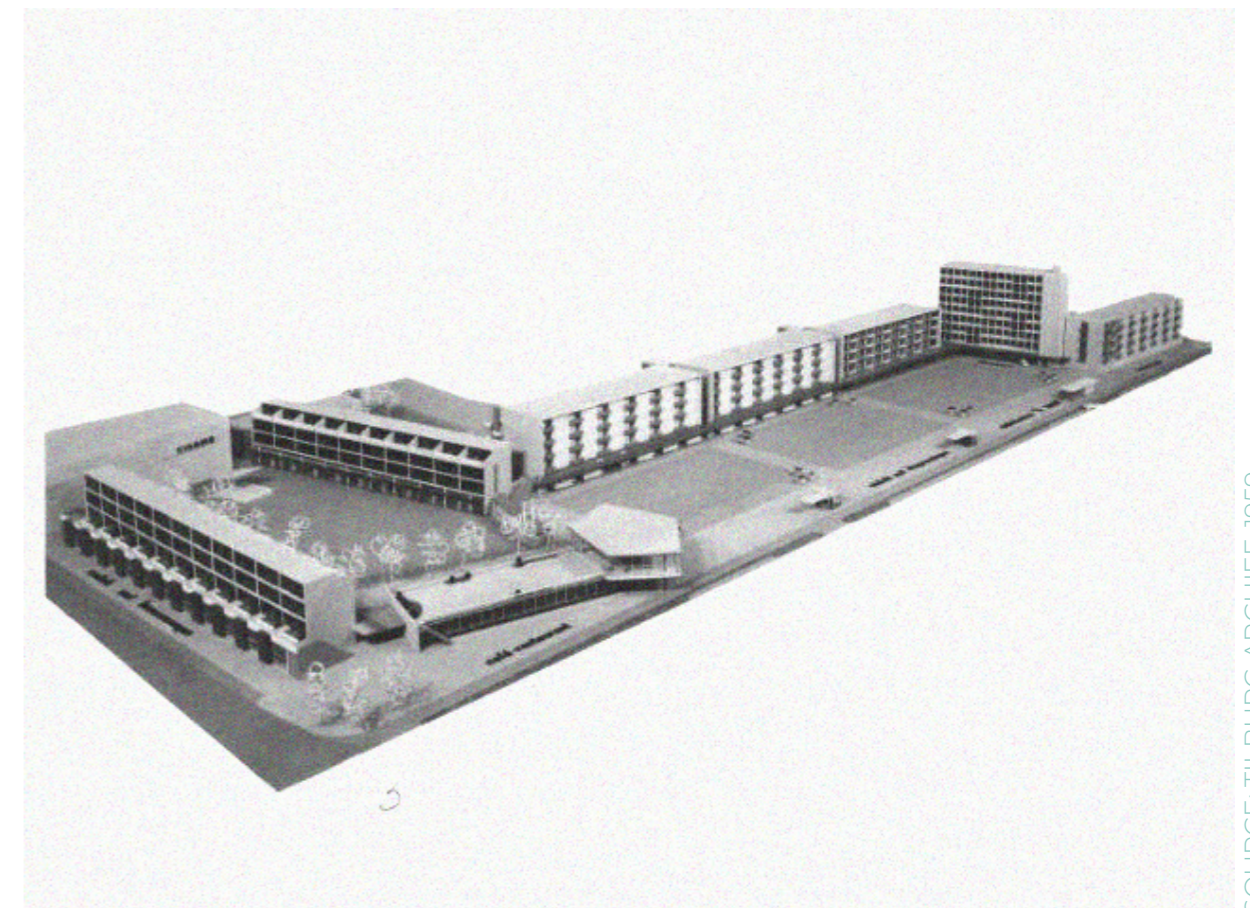
SOURCE: NIEUWE TILBURGSCHE COURANT, 1958



SOURCE: TILBURG ARCHIEF, 1959



SOURCE: HET NIEUWE INSTITUUT ARCHIEF, 1959



SOURCE: TILBURG ARCHIEF, 1959

ARCHITECTS: J.STRIK AND J.SCHIJVENS (1961)



SOURCE: REGIONAAL ARCHIEF TILBURG, N.D.



SOURCE: REGIONAAL ARCHIEF TILBURG, N.D.



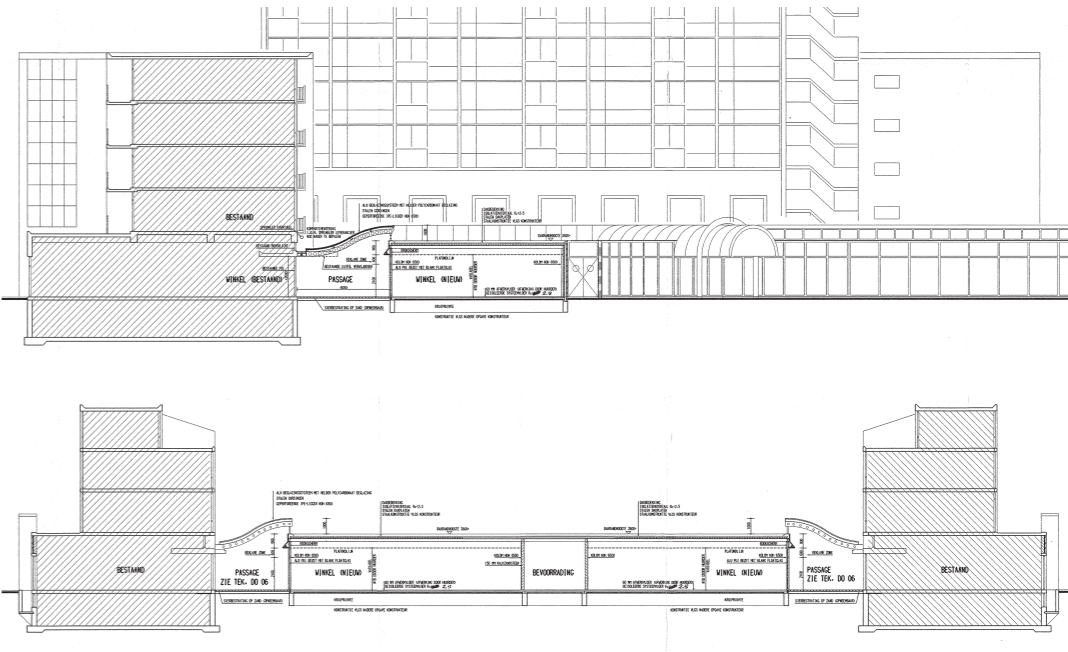
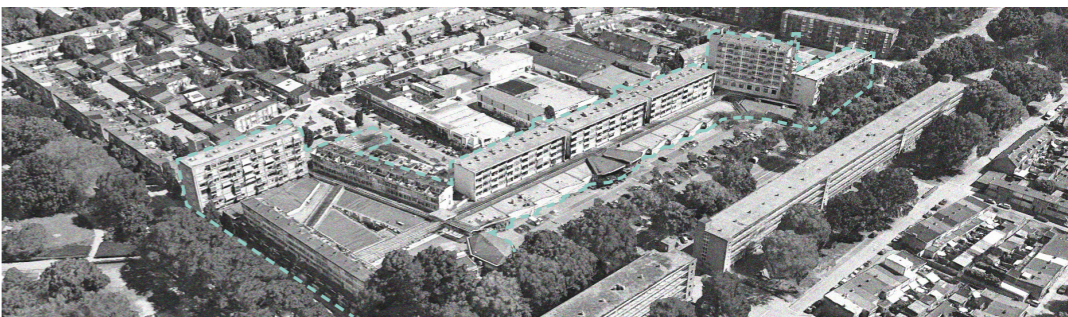
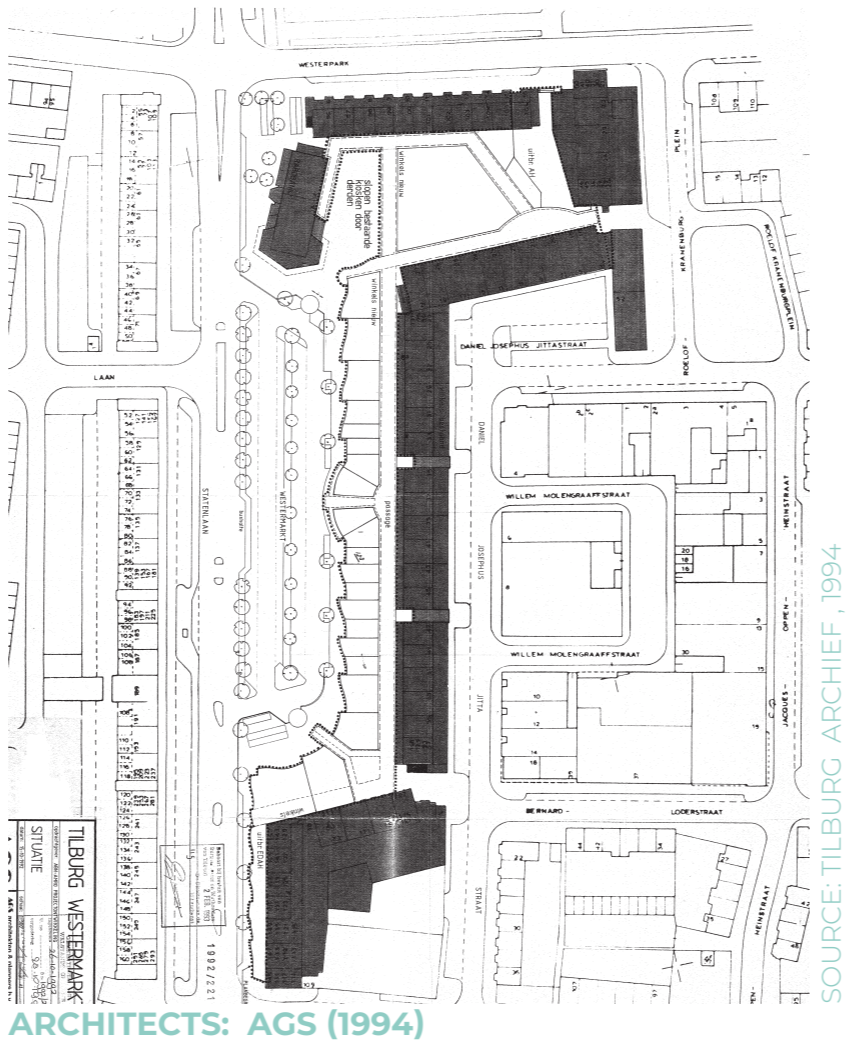
SOURCE: REGIONAAL ARCHIEF TILBURG, N.D.



SOURCE: REGIONAAL ARCHIEF TILBURG, N.D.

WESTERMARKT - EXPANSION

Over the years, the market lost in importance and the square has been partly built over with covered shopping arcades that are strongly inward-looking. This created a thriving shopping centre, but the spatial quality of the original plan was largely lost. (Wurck, 2009). The added stores presented themselves with a blind wall to the parking lots and Statenlaan. It also affected the original routing through the site, blocking some of the main axis and making Westermarkt a barrier, when the shopping center is closed.



1994 - CURRENT



REGIONAAL ARCHIEF TILBURG, N.D.



REGIONAAL ARCHIEF TILBURG, N.D.



REGIONAAL ARCHIEF TILBURG, N.D.



REGIONAAL ARCHIEF TILBURG, N.D.

1961 - 1994



REGIONAAL ARCHIEF TILBURG, N.D.

1994 - CURRENT



OWN PHOTO, 2023



REGIONAAL ARCHIEF TILBURG, N.D.



OWN PHOTO, 2023

WESTERMARKT DEVELOPMENT



1960



1960-1970



1970-1990

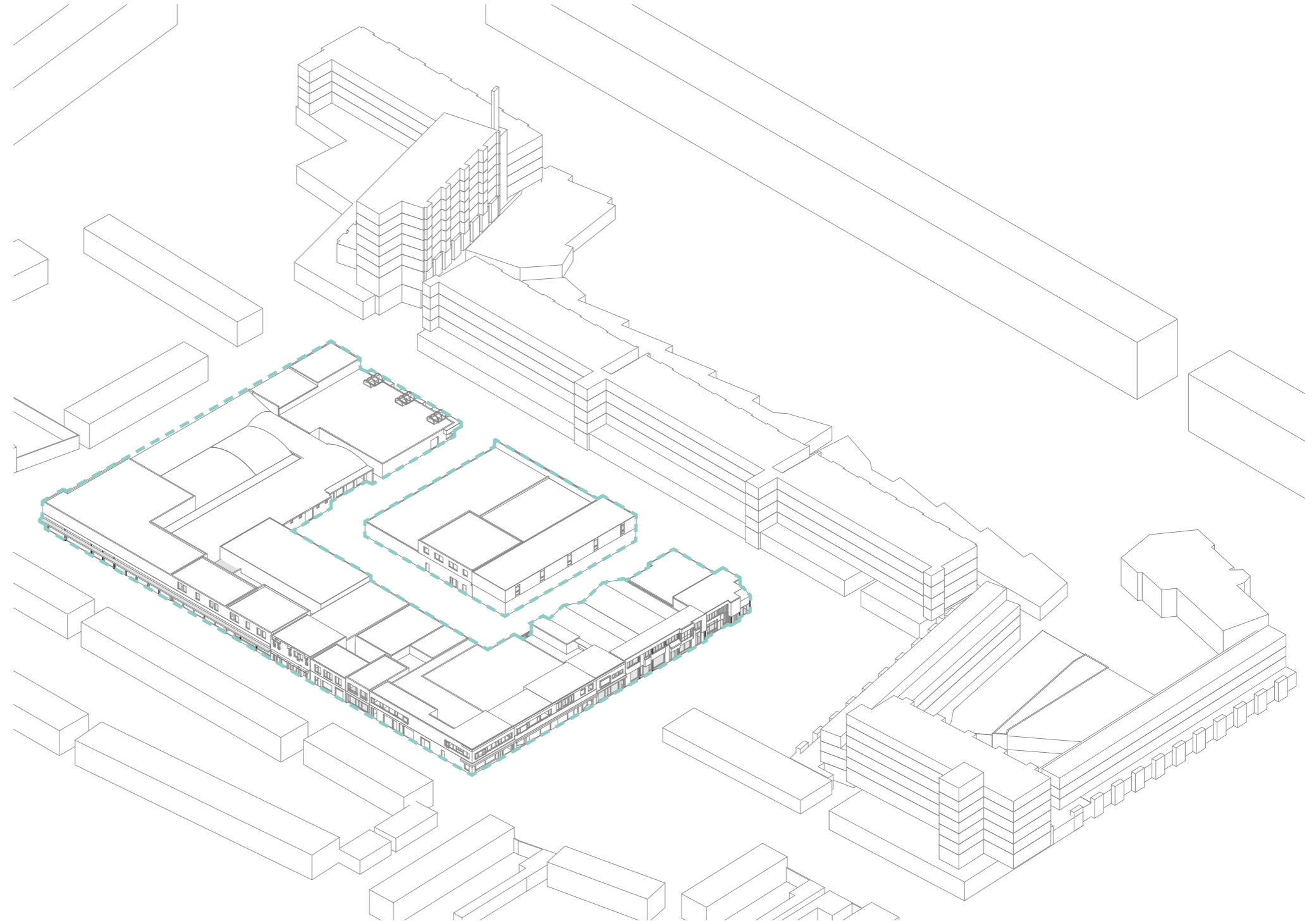


1990-2000

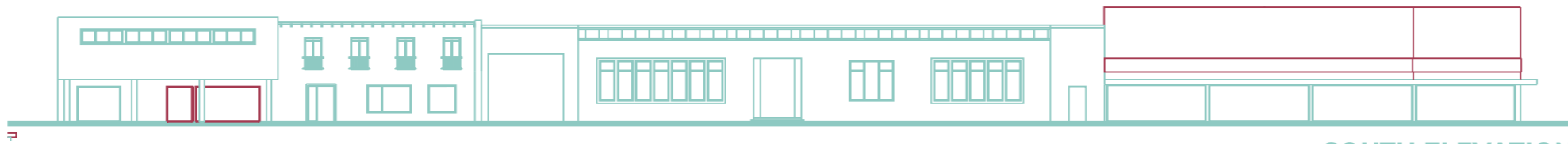
## WESTERMARKT - BUSINESS PARK

Directly behind the Westermarkt is an isolated shopping and business area that is functionally part of the centre, but is poorly attached to its surroundings and feels like a different world, difficult to reach and sandwiched between residential buildings. The area was designed as an inner-city business park, but now mainly houses shops, like HEMA or ACTION.

This block and the rest of the shopping center is separated by DJ Jitta Street with the back of the stores facing this street. The space is mainly used for traffic, parking and logistics and is not a pleasant place for people.



BLOCK ELEVATIONS



SOUTH ELEVATION



EAST ELEVATION



NORTH ELEVATION



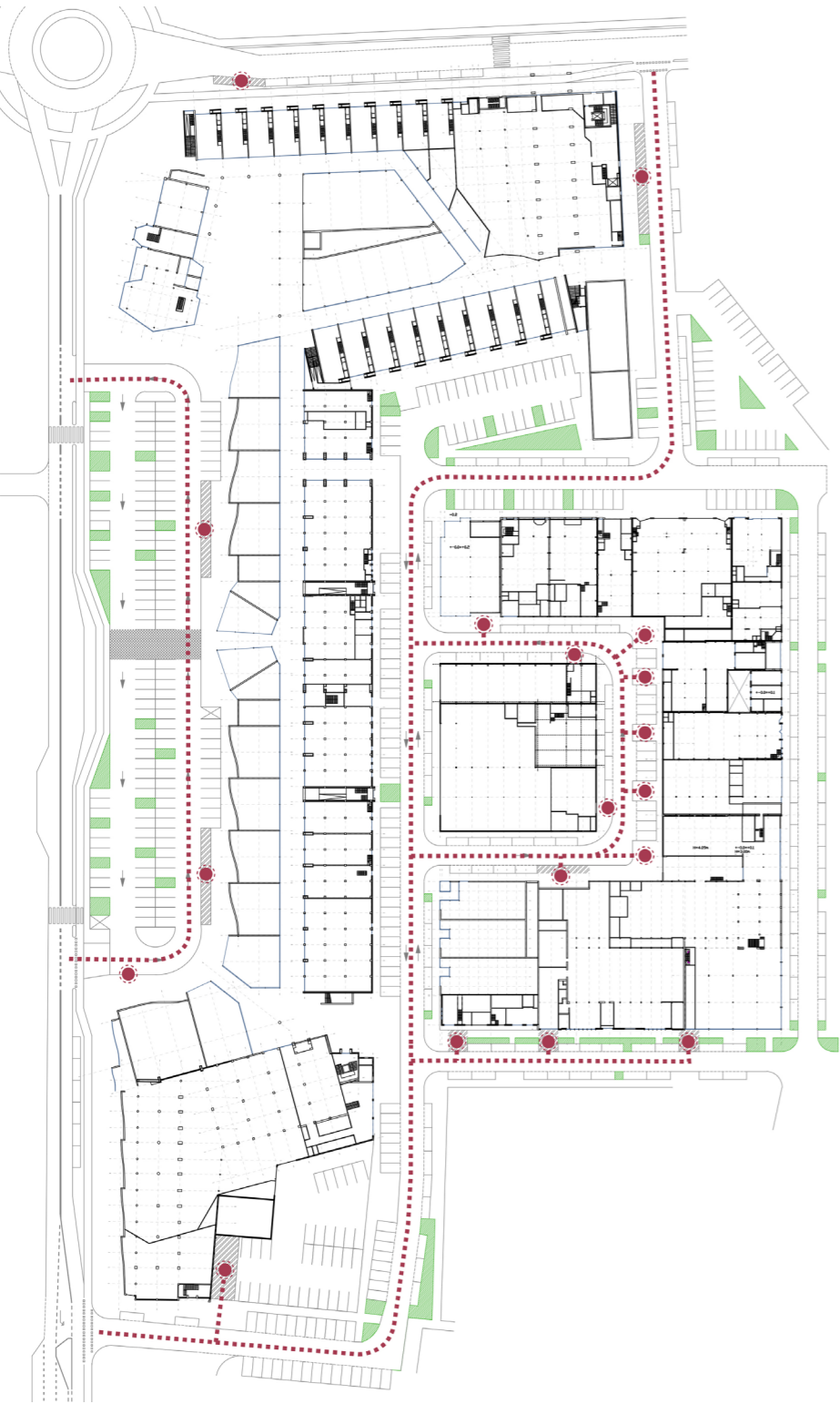
WEST ELEVATION

ORIGINAL AND NEW ELEMENTS

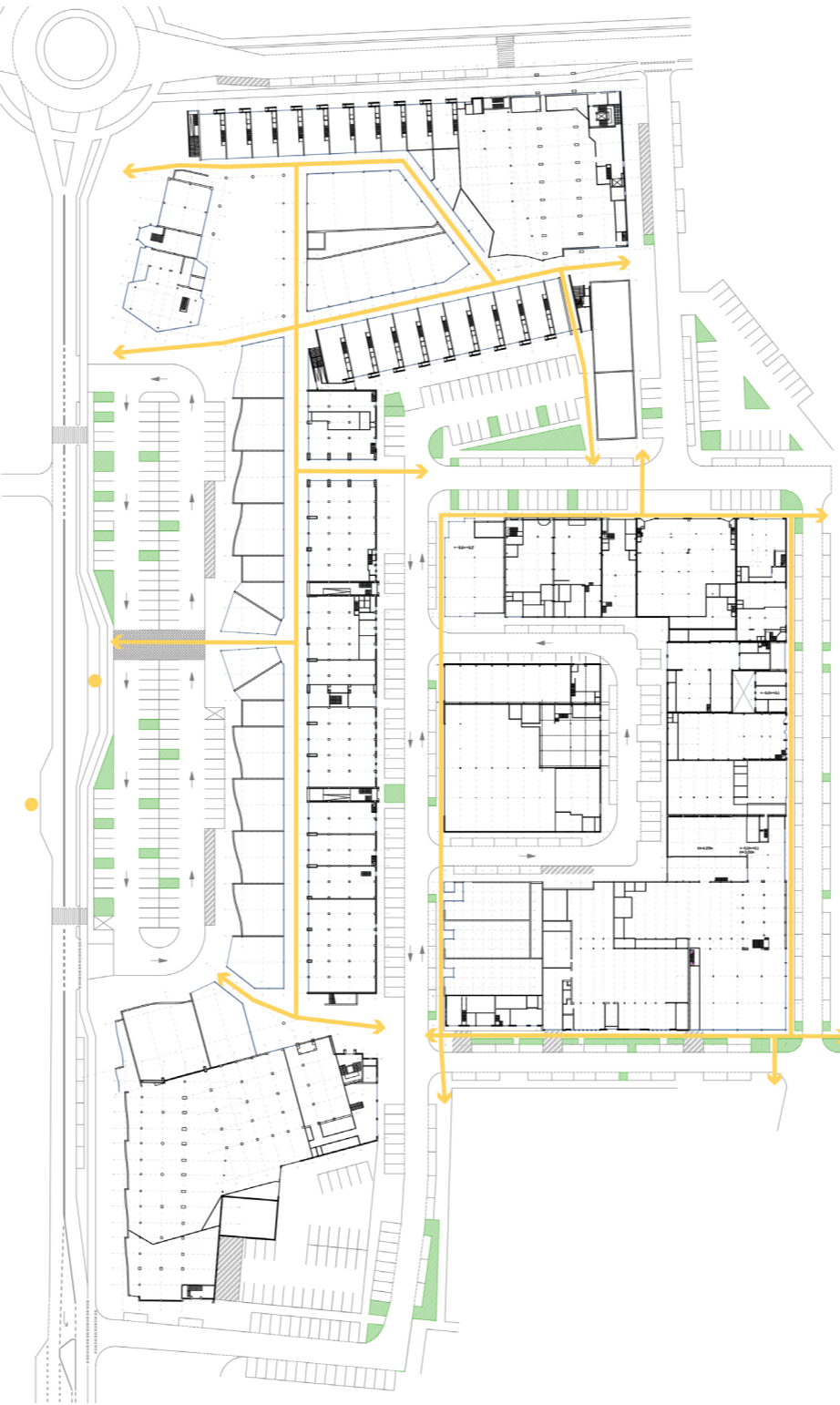


MOVEMENT

GOODS



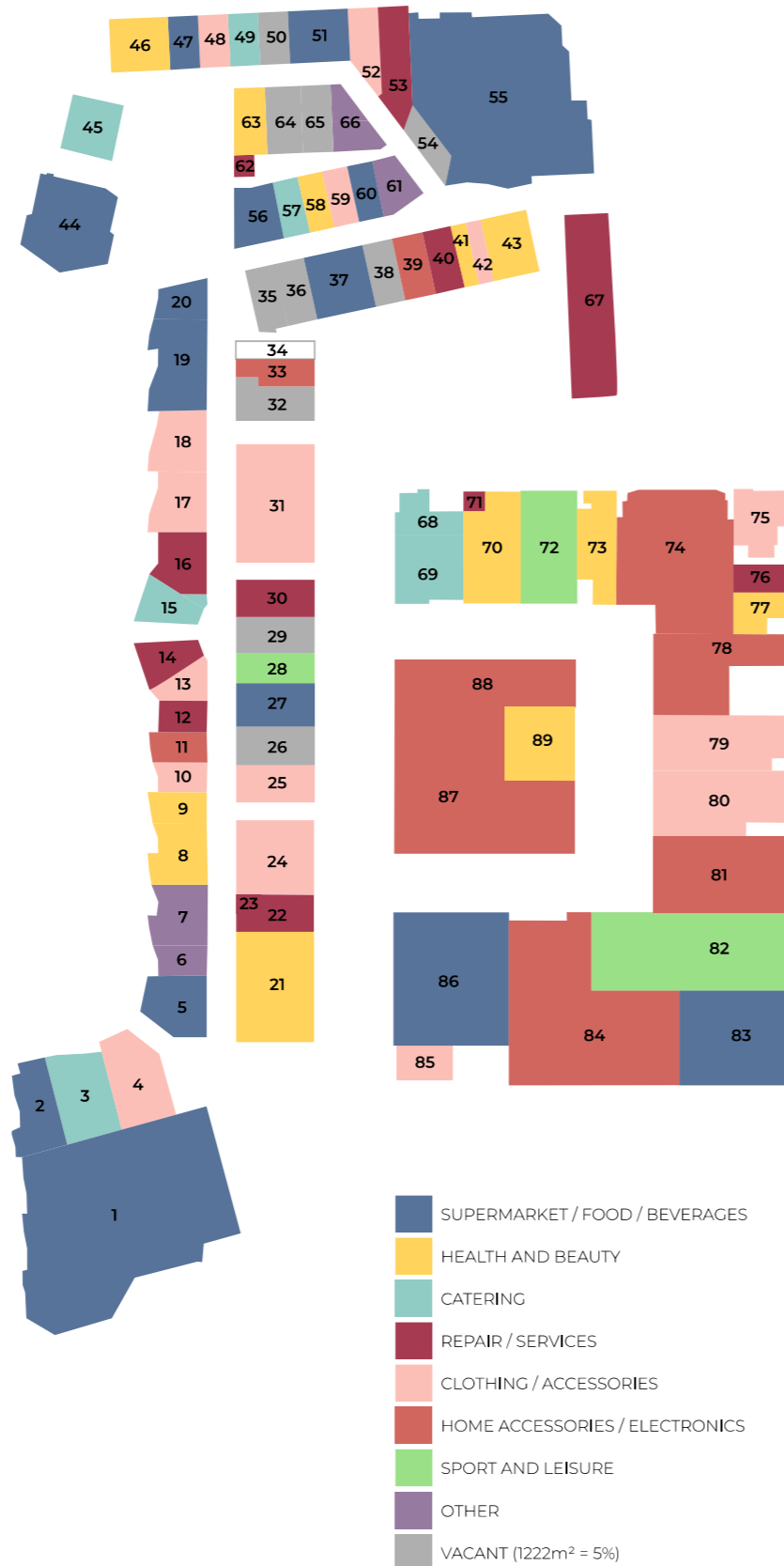
PEDESTRIANS



BIKES



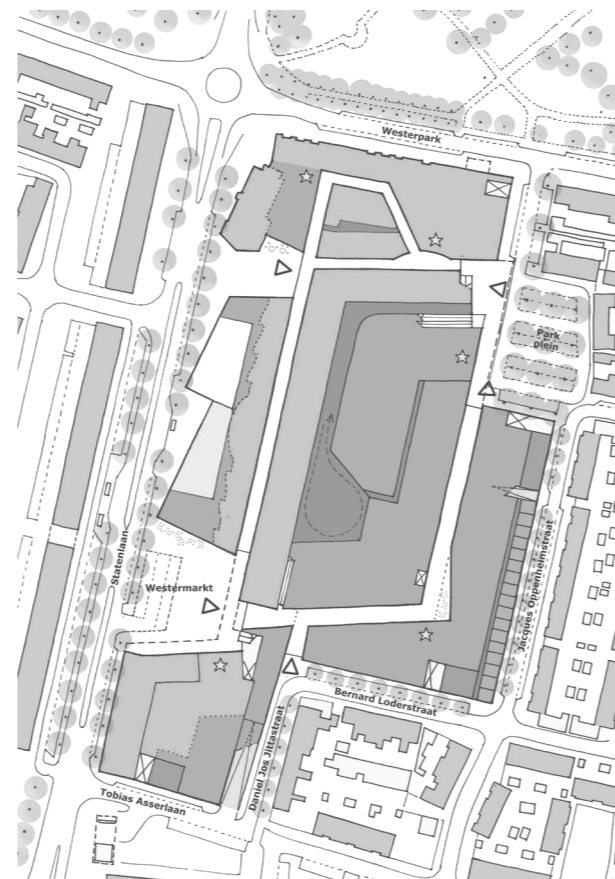
- 1 JUMBO
- 2 TOKO ASHIA ZHOU
- 3 HIZMET BAKKERIJ
- 4 JOLA MODE
- 5 MITRA SLIJTERIJ
- 6 E-SMOKERWINKEL
- 7 PRIMERA
- 8 SPECSAVERS
- 9 LIHN'S NAILS
- 10 BULLENS BYOUX
- 11 ZABI GSM CENTRE
- 12 BRAINWASH
- 13 PERFECTO MANNENMODE
- 14 BETER HOREN
- 15 PANACHE LUNCHROOM
- 16 DONDEERS SECURITY
- 17 SHOEBY FASHION
- 18 MILLENIUM CLOTHING
- 19 SLAGERIJ PESSERS
- 20 MEESTERBAKKER VAN LERSEL
- 21 KRUIDVAT
- 22 COPY&CO
- 23 SCHOENSERVICE
- 24 CLOTHING STORE
- 25 BELLAMO
- 26 -
- 27 JAMIN
- 28 AKTIESPORT
- 29 -
- 30 EUROGOUD
- 31 ZEEMAN
- 32 -
- 33 VODAFONE / ZIGGO
- 34 WESTERMARKT SECURITY
- 35 -
- 36 -
- 37 GOVERT VAN NUNEN
- 38 -
- 39 GSM CENTRE
- 40 SNS BANK
- 41 ZAZA BARBERSHOP
- 42 VAN MIERLO MODE
- 43 HANS ANDERS
- 44 FAMILY DISCOUNTER
- 45 TUINHUIS CULINAIR
- 46 BOOTS APOTHEEK
- 47 PALOELOE
- 48 MAISON CLAIRE
- 49 MEVROUW POLKA
- 50 -
- 51 AFAMIA SUPERMARKT
- 52 ECOGENTS
- 53 SMITS ZWIELER SERVICE
- 54 -
- 55 ALBERT HEIJN
- 56 KIPPIE
- 57 REITSMA SEAFOOD
- 58 MEVAN HERENKAPSALON
- 59 TER HORST VAN GEEL MODE
- 60 LEKKERNIJ DELICATESSEN
- 61 'T BOEKETJE
- 62 ZILVER SCHAAR
- 63 PEARLE OPTICIEN
- 64 -
- 65 -
- 66 'T BOEKETJE SHOWROOM
- 67 THEBE / GEZONDHEIDSCENTRUM
- 68 EETHUIS BALLIE
- 69 FOOD FABRIQUE
- 70 MD BEAUTY LINE
- 71 POMOC HOLANDIA
- 72 BOEKENSCHOEP
- 73 SEFA'S HAIRCOMPANY
- 74 HEMA
- 75 DIVANA
- 76 SMARTPHONE EXPRESS
- 77 YETKIN HAIR&BEAUTY
- 78 JOUW WINKELKAST
- 79 WIBRA
- 80 NEW VULTO
- 81 MEUBELTREND
- 82 GIANT STORE VAN BEBBER
- 83 EMIN SUPERMARKT
- 84 PRIJSMEPPERS
- 85 ZOWIEZO
- 86 PROSNA SUPERMARKT
- 87 ACTION
- 88 PORTA AGORA
- 89 BEAUTY BY FEYZA



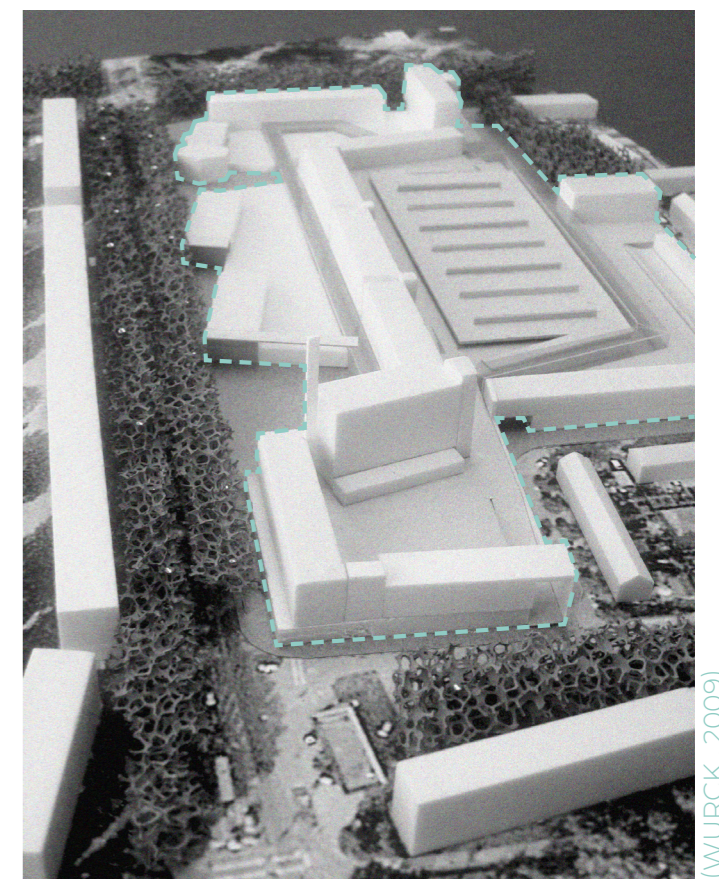
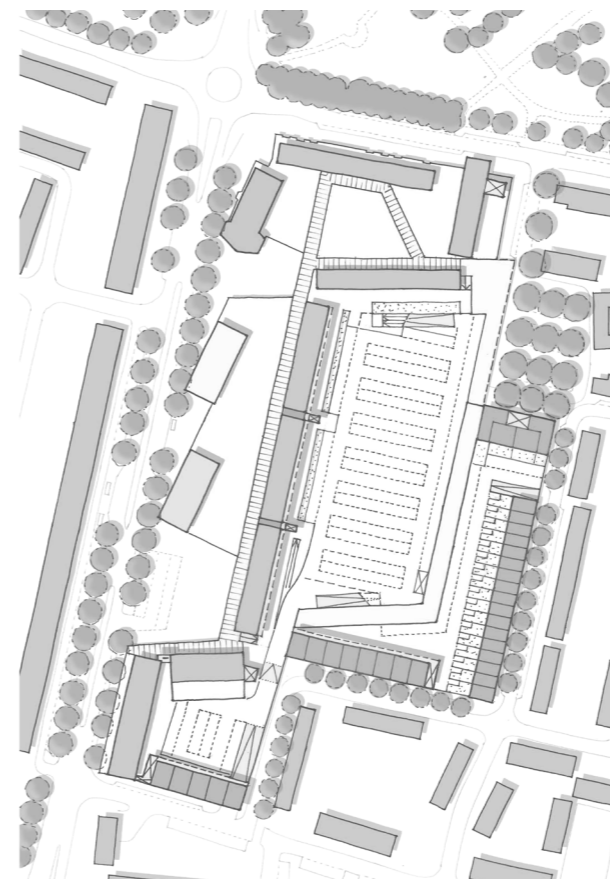
## WESTERMARKT - WURCK

"As part of a developer selection, wUrck was commissioned by ASR Vastgoed Ontwikkeling to carry out a design study for a radical revitalization and expansion of the urban district centre. The current cluttered system of shopping passages will be cleaned up and completed into an attractive and well-arranged shopping circuit. The center becomes one coherent whole. Three well-proportioned squares, each with its own strong character, clearly connect the passage circuit to its surroundings, responding where possible to the original monumental qualities of the plan. New fronts on the Statenlaan turn this district access road into an urban boulevard. The parking capacity is greatly increased by means of a double parking deck cleverly incorporated into the building block" (Wurck, 2009)

The plan by Wurck was never carried out.



ARCHITECTS: WURCK (2009)







(WURCK, 2009)

WESTERMARKT - TODAY

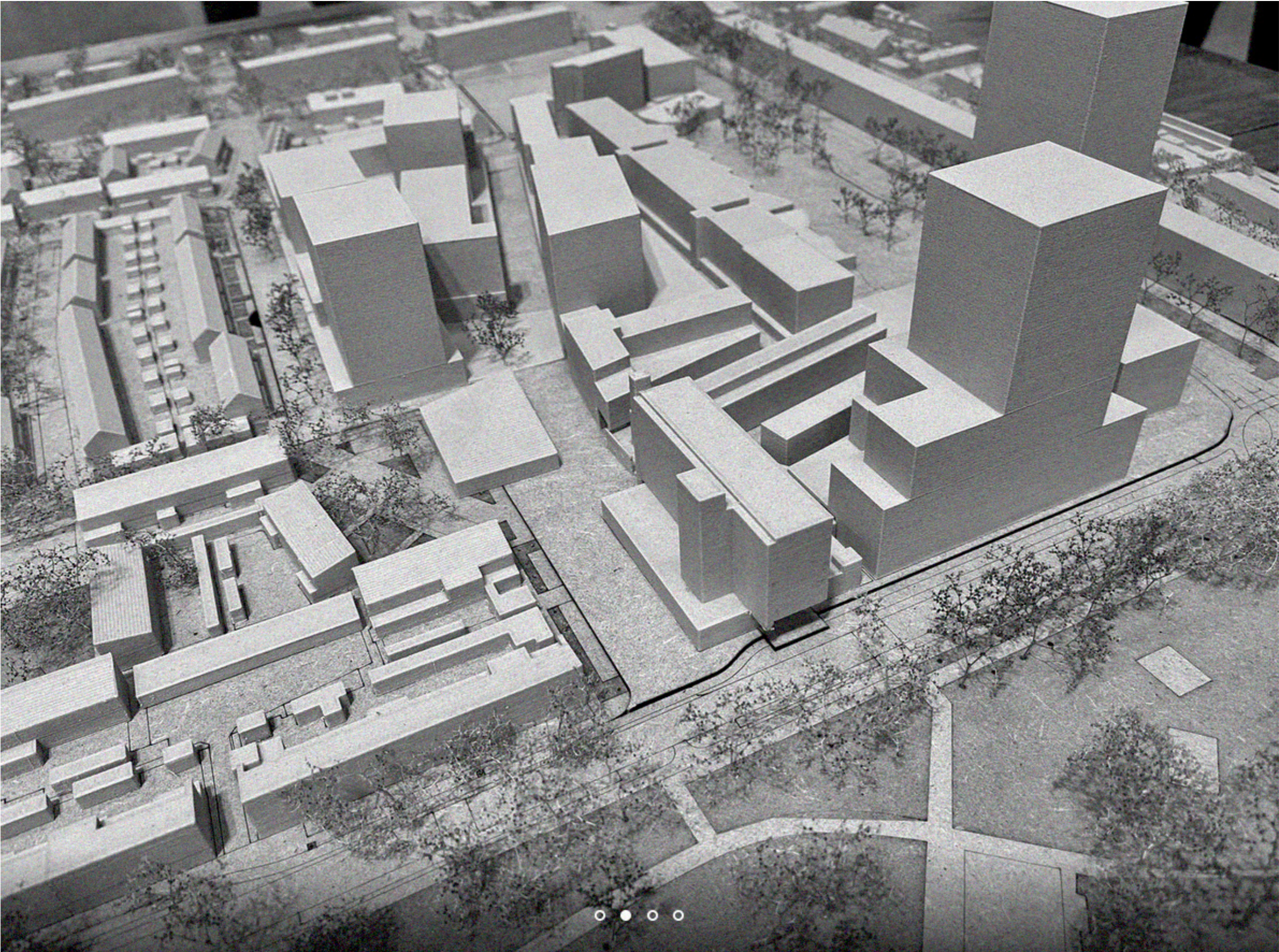
The fragmented ownership of homes and stores, the diverse interests of operators and the traffic and parking pressure make an integrated approach to the Westermarkt a major challenge. (Gemeente Tilburg, 2021)

Since 2007, chairman Peter Blankenstein of the Collective Restructuring Westermarkt has tried to agree with different stakeholders on the same vision of Westermarkt. The plan was always to combine the covered passage and the shops behind it into one whole . At the request of the municipality, ‘a very last attempt’ was made in 2015 to get all parties agree on a common design. “Unfortunately, that didn’t work out,” said Blankenstein. Plans are now being made for a facelift of only the covered part of the shopping centre (Jongerius, 2015).

In the coming years, retaining and attracting (more) visitors to the Westermarkt is on the agenda. Filling the vacancy is given priority, serious investments are made in events, activities and marketing. (Jongerius, 2019)

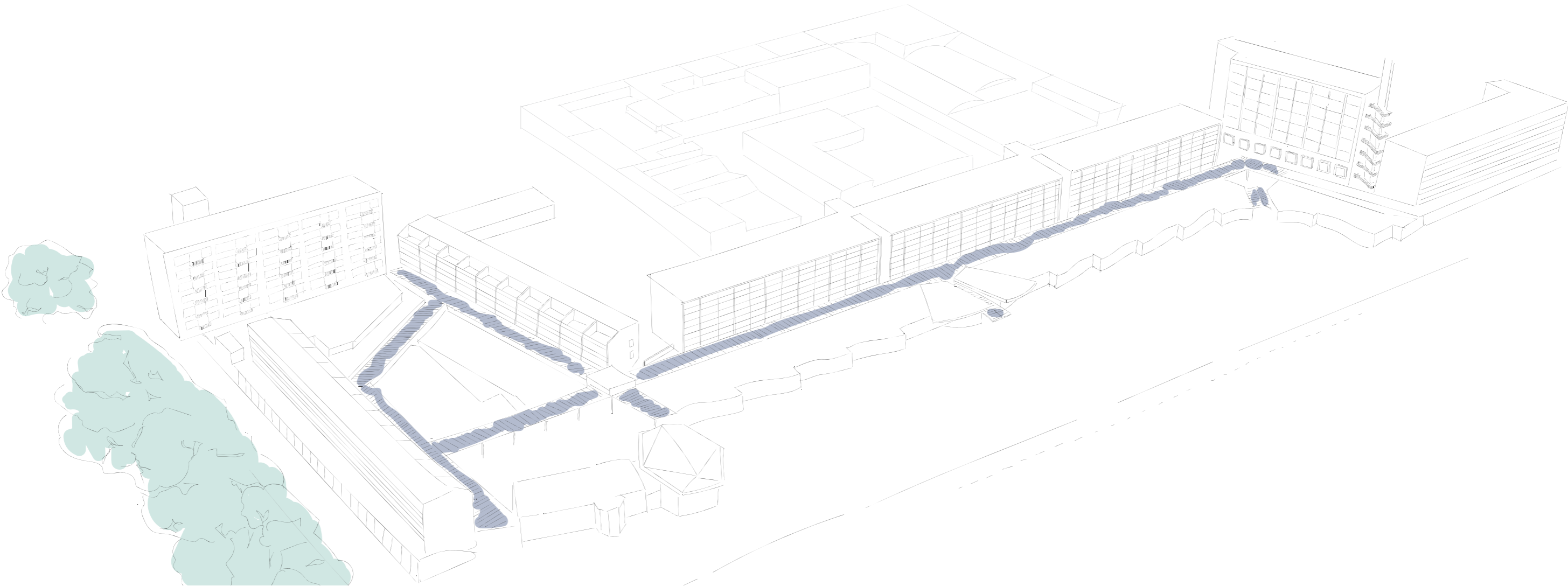
|  |  |
|--|--|
| <div><div></div><div><div>frank cleton</div><div>Local Guide · 21 reviews</div></div></div> <div><div><div>★ ★ ★ ★ ★</div><div>4 months ago</div></div><div><div>(Translated by Google)</div><div>Loss of once a well-run and important "neighborhood" center. What now remains are dubious hair salons and clothing outlets that are allowed to put their no less dubious clothing in the barrel.... making the impoverishment even more noticeable....</div></div><div><div>(Original)</div><div>Teloorgang van eens een goed lopend en belangrijk "buurt" centrum. Wat nu rest zijn dubieuze kapsalons en kleding outlets die hun niet minder dubieuze kleding in de loop mogen zetten.... waardoor de verpaupering nog meer opvalt....</div></div></div> | <div><div></div><div><div>Raoul</div><div>Local Guide · 36 reviews</div></div></div> <div><div><div>★ ★ ★ ★ ★</div><div>4 months ago</div></div><div><div>(Translated by Google)</div><div>The Westermarkt in this setting has been around for almost 30 years. If you see what people have done with other shopping centers, it would be appropriate if De Westermarkt was now up for a makeover. 3 stars just on.</div></div><div><div>(Original)</div><div>De Westermarkt in deze setting bestaat al bijna 30 jaar. Als je ziet wat men heeft gedaan met andere winkelcentra zou het passend zijn als De Westermarkt nu aan de beurt is voor een make-over. 3 sterren net aan.</div></div></div> |
| <div><div></div><div><div>Joost De Hond</div><div>Local Guide · 19 reviews</div></div></div> <div><div><div>★ ★ ★ ★ ★</div><div>7 months ago</div></div><div><div>(Translated by Google)</div><div>Nowadays it is really outdated and more and more nice shops are disappearing.</div></div><div><div>Fortunately, the baker and butcher are still there.</div></div><div><div>You can also enjoy a delicious meal at the garden house</div></div><div><div>(Original)</div><div>Het is tegenwoordig wel echt verouderd en er verdwijnen steeds meer leuke winkels.</div></div><div><div>Gelukkig zitten de bakker en slager er nog.</div></div><div><div>Ook kun heerlijk eten bij het tuinhuis</div></div></div>   | <div><div></div><div><div>Martijn V hout</div><div>Local Guide · 155 reviews</div></div></div> <div><div><div>★ ★ ★ ★ ★</div><div>2 weeks ago</div><div>NEW</div></div><div><div>(Translated by Google)</div><div>The atmosphere has lost a bit in recent years..... hope this will come back soon. Too bad about the many vacancy.</div></div><div><div>(Original)</div><div>De laatste jaren zijn sfeer een beetje verloren..... hopen dat dit snel terug komt.jammer van de vele leegstand.</div></div></div>  |

THE NEW VISION FOR WESTERMARKT (2023)



SOURCE: AD.NL, 2023, FEBRUARY 10

CONSUMERIST PRINCIPLES  
IN WESTERMARKT



ABUNDANT AMOUNT  
OF PARKINGS  
MAKING CONSUMPTION  
EASIER TO REACH



DO NOT  
SIT HERE  
FOCUSED  
ON WALKING

CONSTANT MOVEMENT  
CREATES NO TIME  
FOR REFLECTION  
LEADING TO IMPULSIVE  
PURCHASES



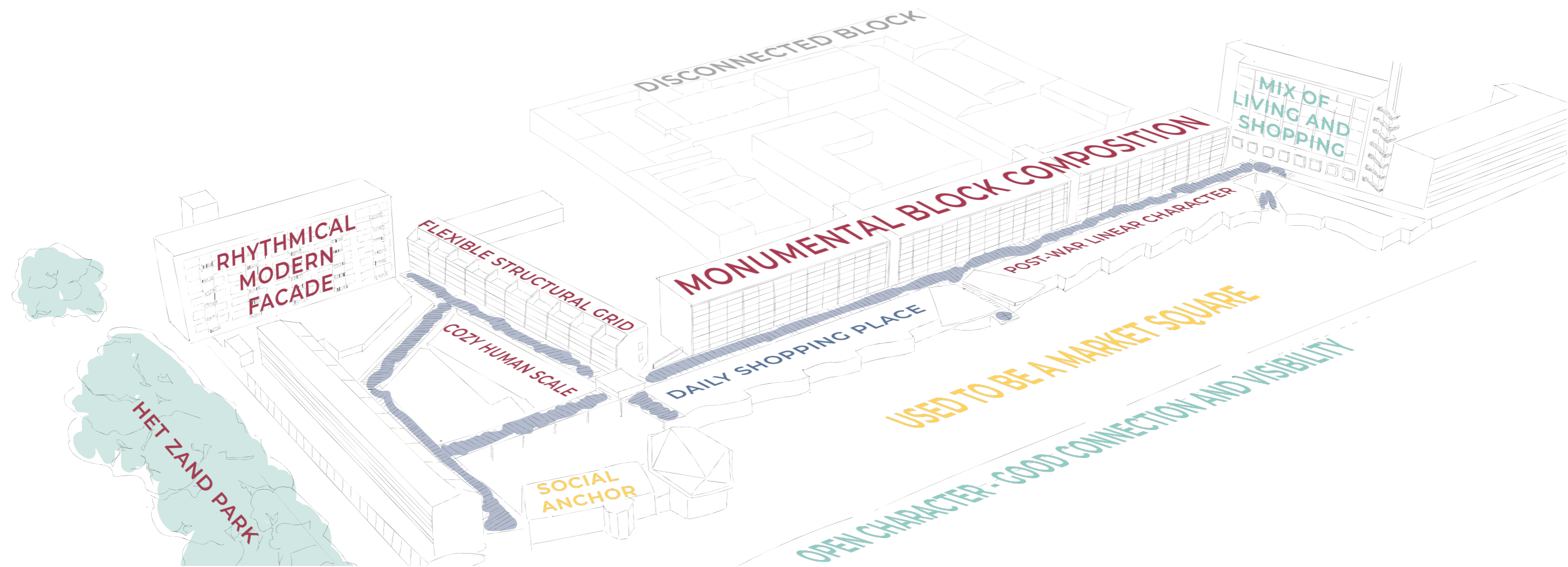
STRIP  
FORM

CLEAR SIGHTLINE.  
SHOPPERS MUST SEE  
AND BE ENTICED BY  
SHEER NUMBER OF  
SHOPS



LIMITED FOCUS ON  
COMMUNITY  
ENCOURAGEMENT  
OF INDIVIDUALITY

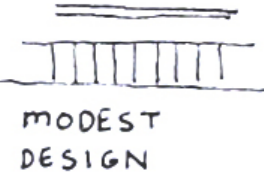
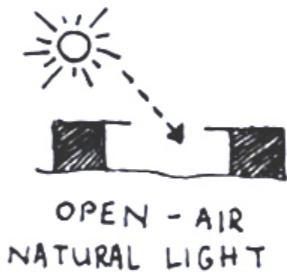
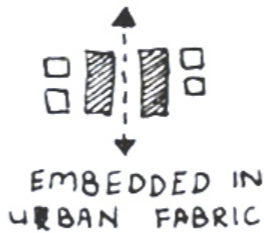
VALUE ASSESMENT



HISTORIC / AESTHETICAL / AGE VALUES:

LOW  
MEDIUM  
HIGH

HIGH:  
- ORIGINAL  
- MONUMENTAL  
- HAS AN AGE VALUE



## CONCEPT

The new addition (1994) strengthened westermarkts consumerist character, making it more introverted and focused on car mobility. As a result taking away public space from the community.

The new addition was not considered of a high quality, therefore my first step was to remove it, bringing back the spatial quality of original plan and making the space less of a barrier and less focused on consumption. The only shops left are the ones that are valued by local people and are needed for the fulfillment of basic needs.

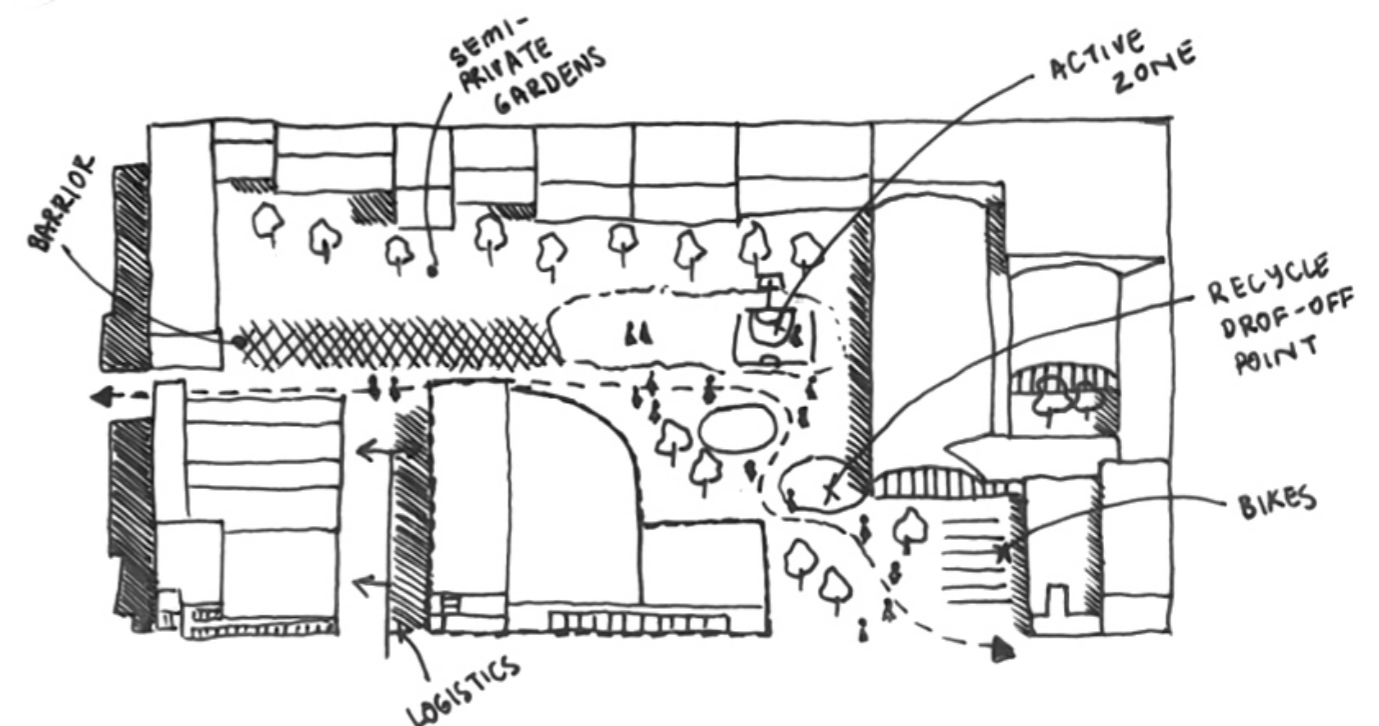
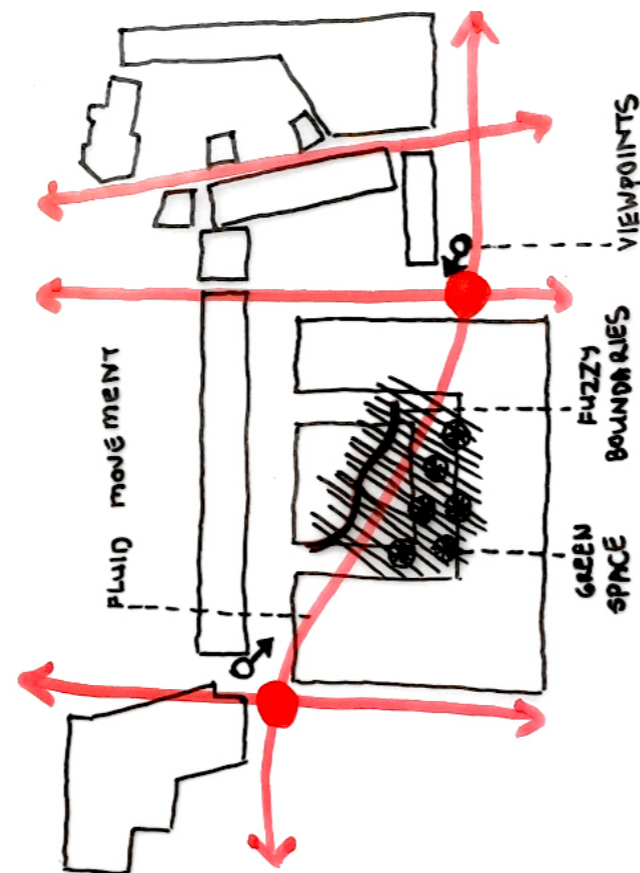
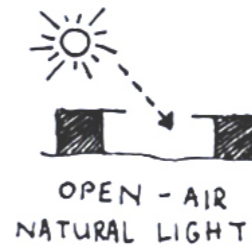
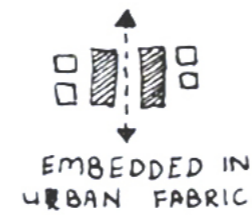
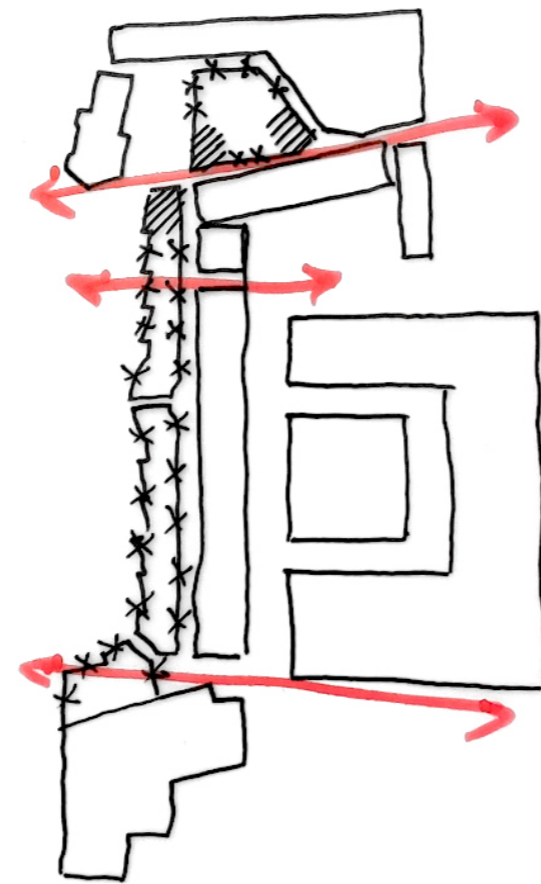
Another major spatial problem in this shopping center is its connection between the front and the back block. Even if the back block is functionally part of the shopping center, the whole complex does not work as one mechanism as both parts are separated by the street.

This spatial problem was addressed by wurck and another recent proposal by unknown designers. As a solution both projects proposed completely removing the whole block, however i did not see it as sustainable solution and instead opted for adaptive reuse of existing buildings, converting the block into multifunctional mix of living, retail and facilities for textile recycling, repair and reuse, as a result bringing new value to this block.

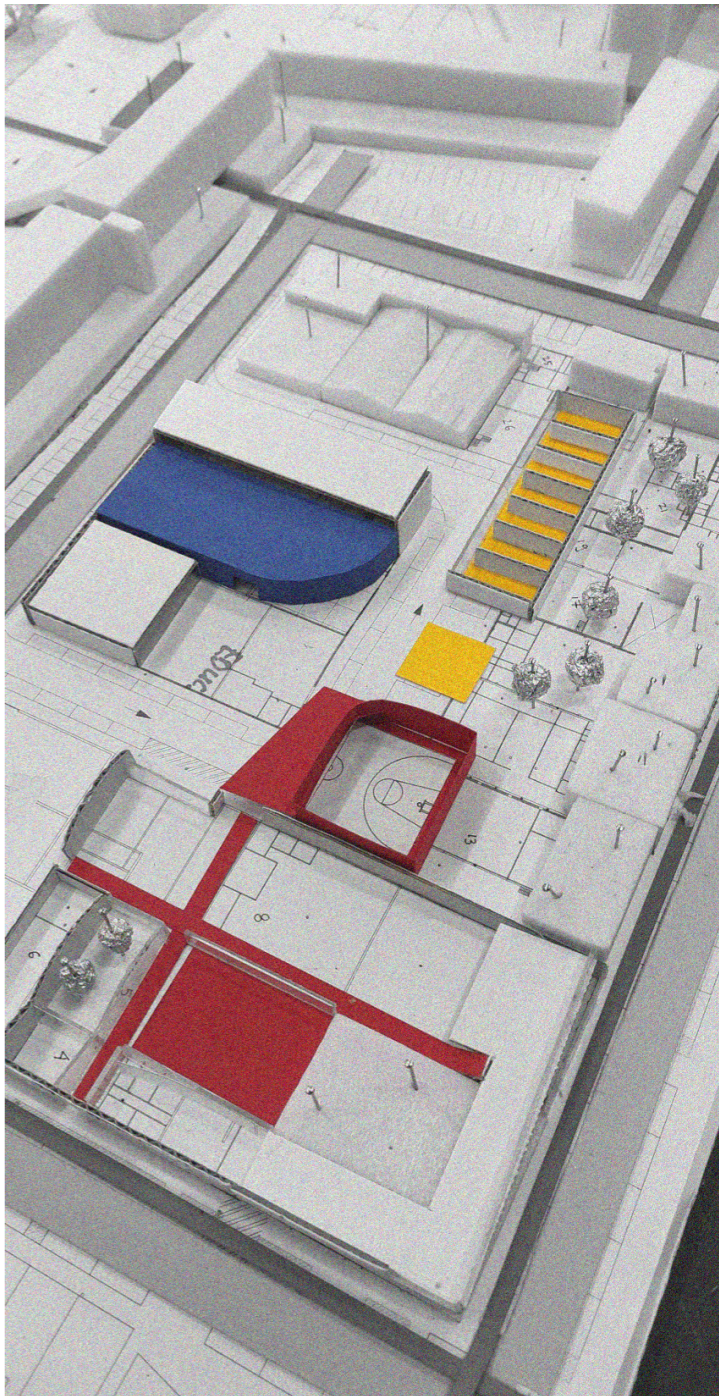
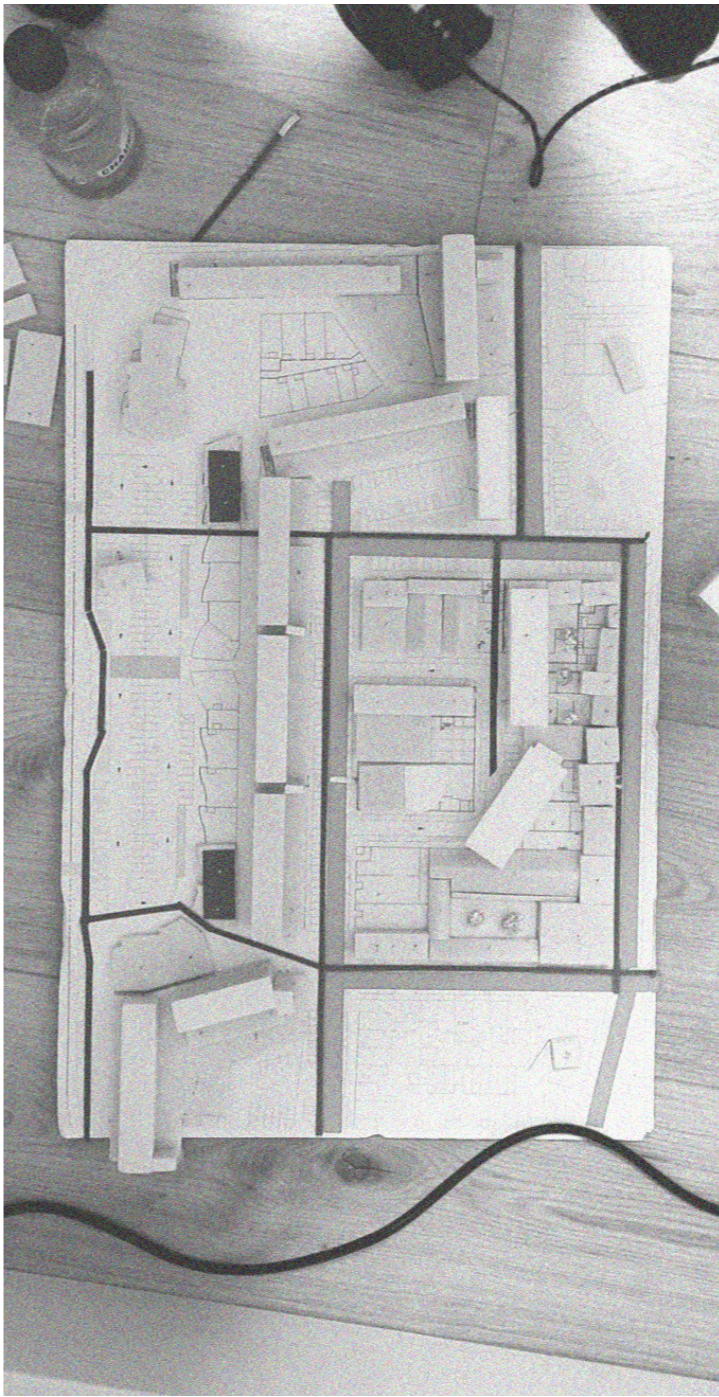
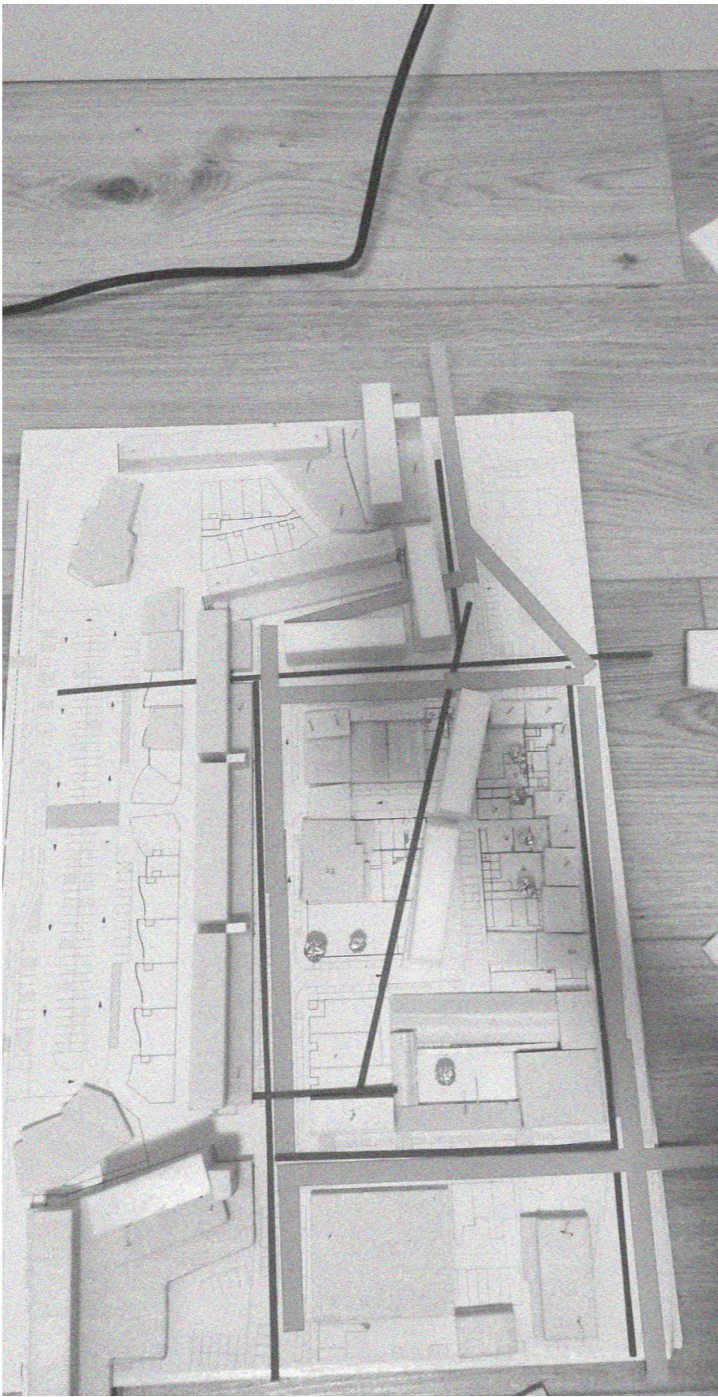
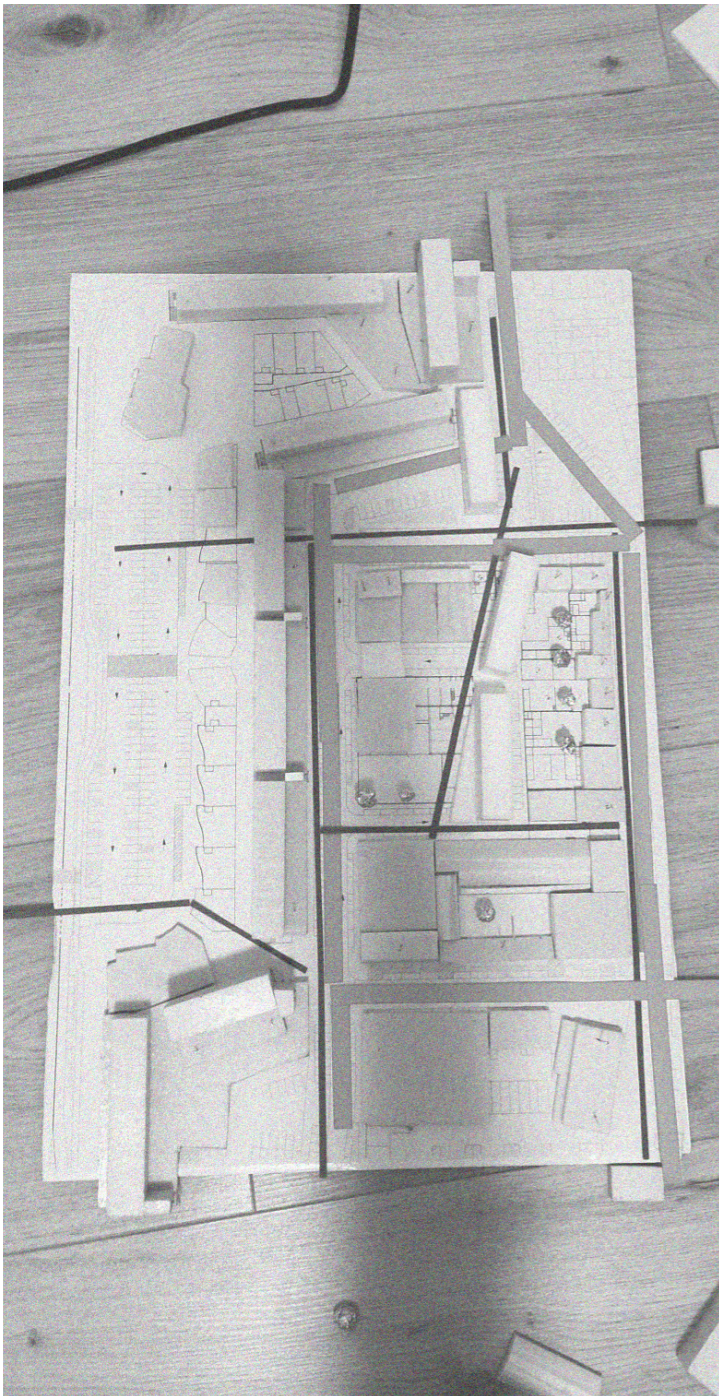
The block itself appeared to be pretty problematic. Being surrounded by traffic and covered by asphalt it was completely not suitable for pedestrian movement.

As a designer i wanted to make this backside more pleasing and create more green and pedestrian friendly space. I found that the most logical solution was to eliminate car traffic here and create a pedestrian zone instead, thus also connecting the two main axis of westermarkt, making the block more accessible.

To lower the heat island and introduce more greenery, I chose to demolish storage spaces of the existing shops and convert these shops into housing. It is envisioned that the elements from the demolished storage spaces could be reused for additional housing blocks.



VOLUME STUDY



URBAN FUNCTIONS - EXISTING

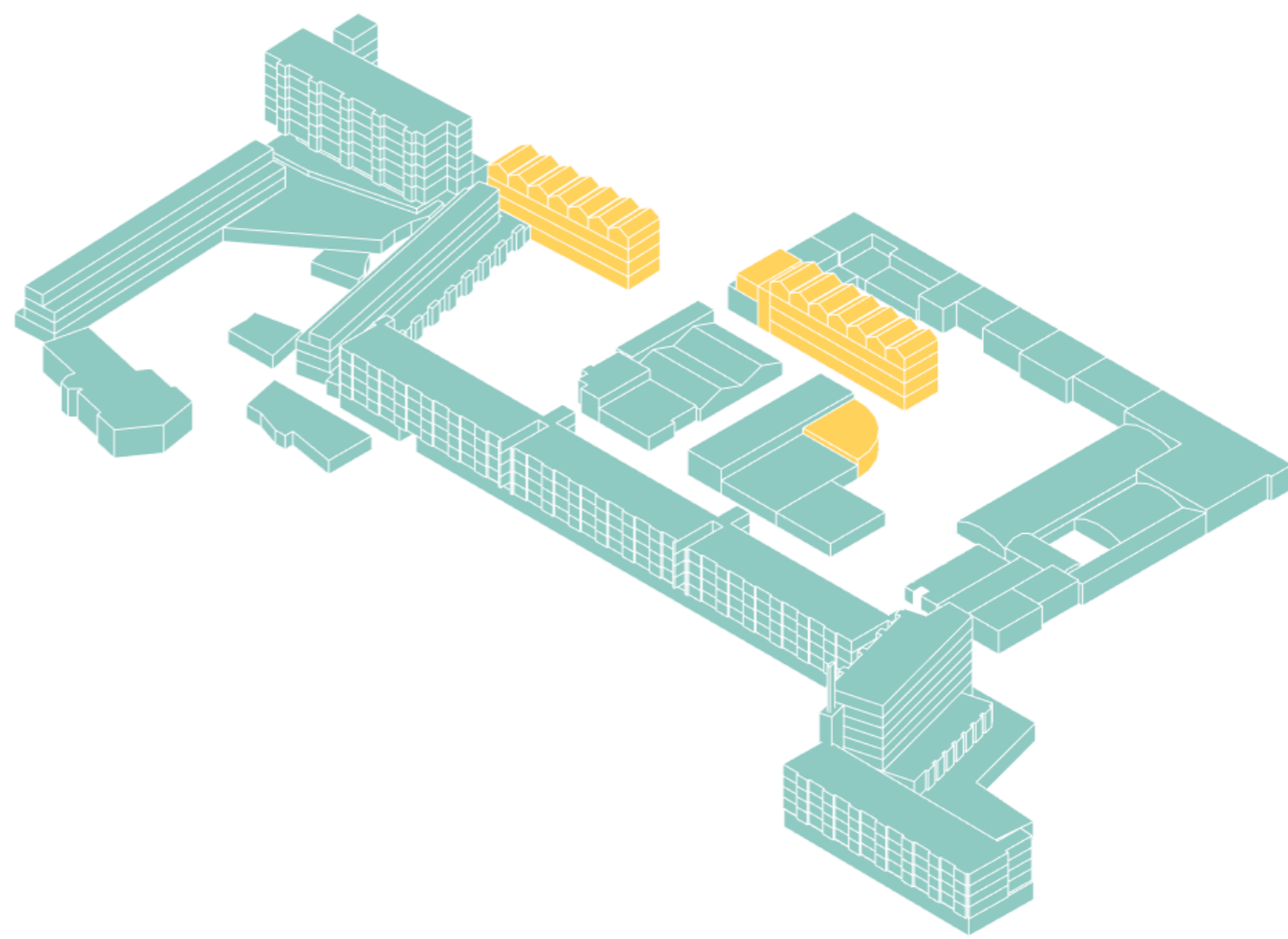
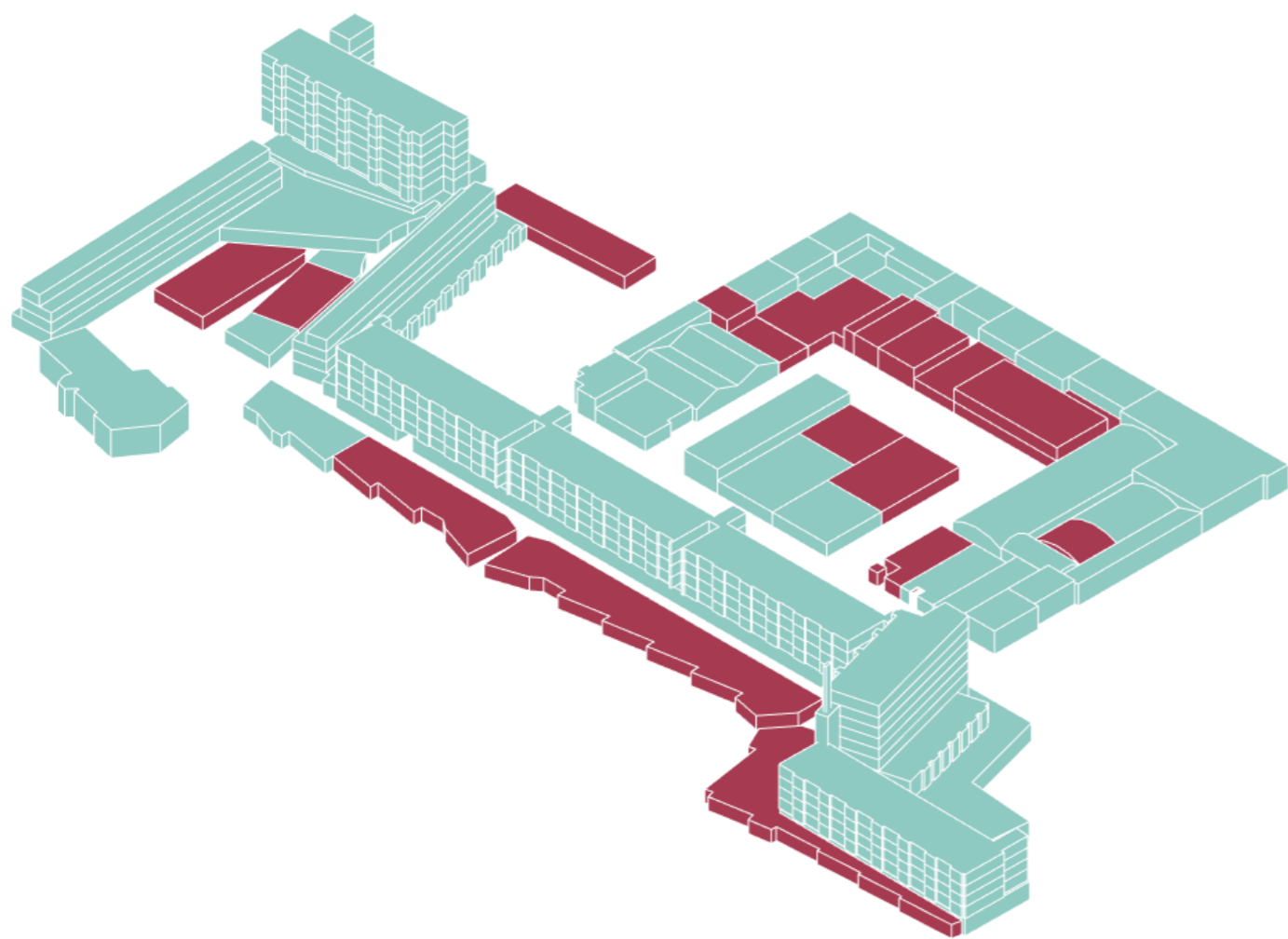


URBAN FUNCTIONS - NEW



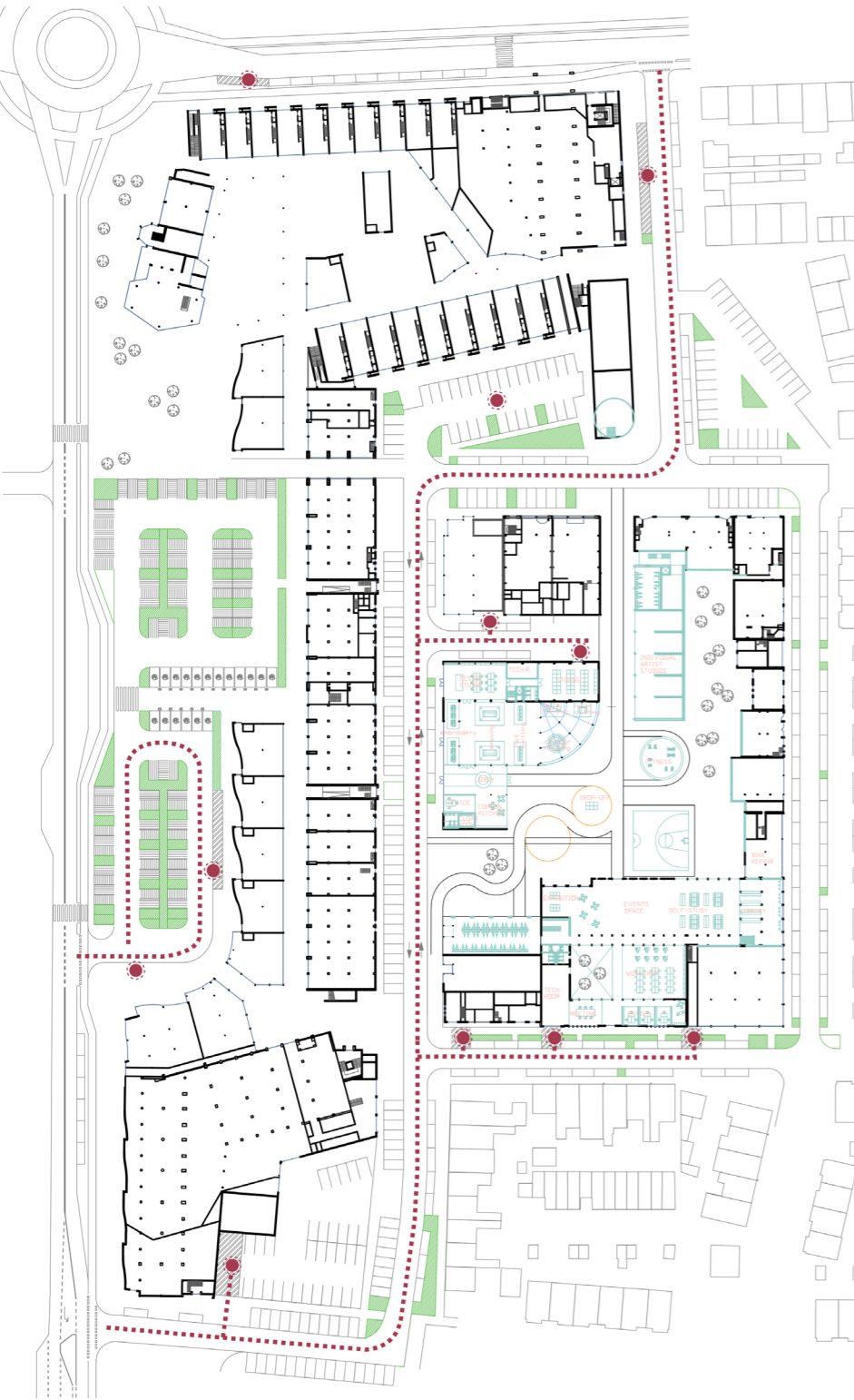
DEMOLISHMENT PLAN

- KEEP 136 525 M3
- REMOVE 24 270 M3 (17%)
- ADD 13 191 M3

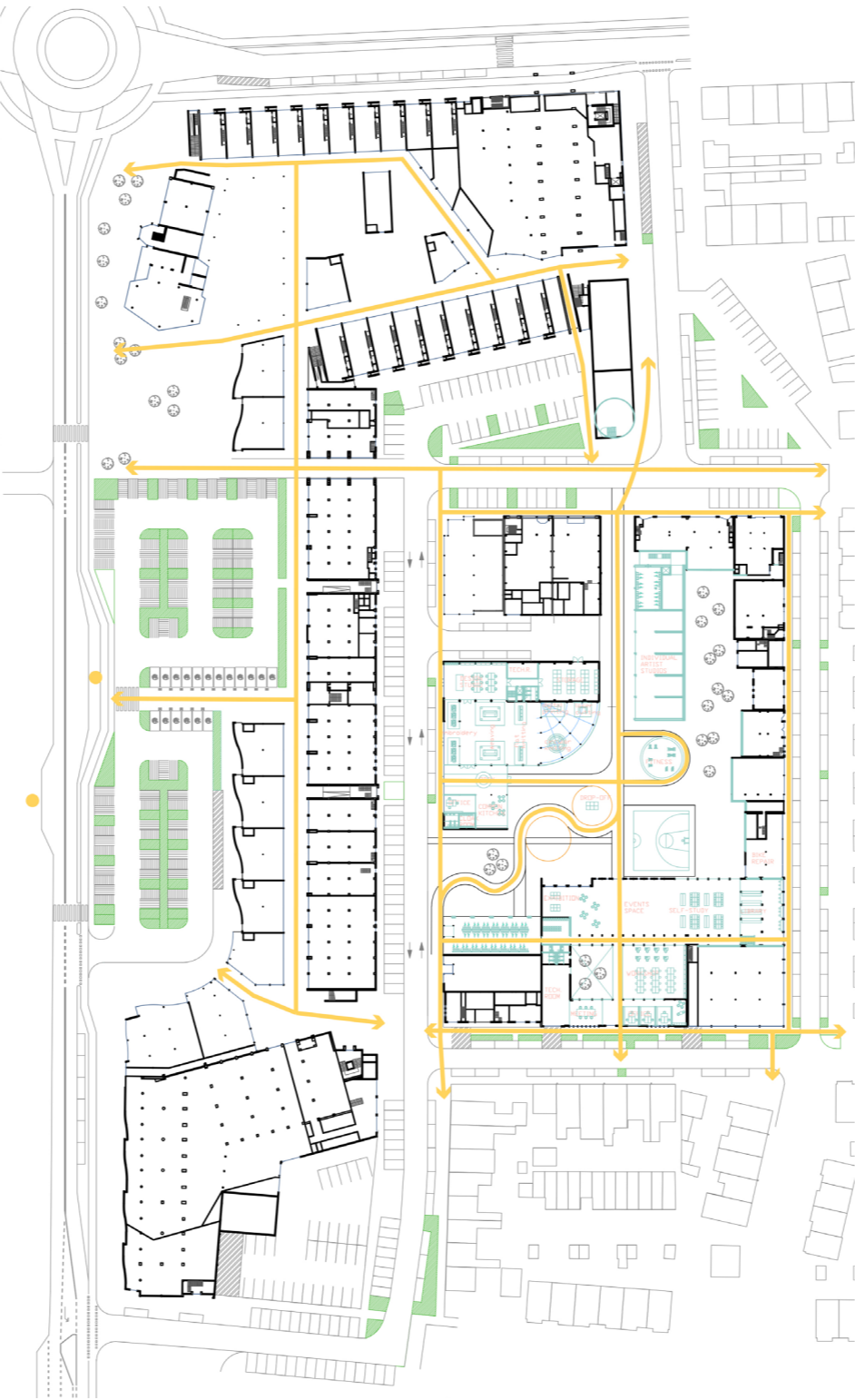


MOVEMENT

GOODS



PEDESTRIANS



BIKES



PARKING REGULATIONS

| Function  | Maximum acceptable walking distances |                         |
|---|--------------------------------------|-------------------------|
|   | Inner city                           | Outside the city center |
| Living  | 250-300 meters                       | 100-200 meters          |
| Visitor features<br><br>(shops, leisure facilities, care facilities,<br>educational institutions, etc.) | 250 - 600 meters                     | 100 - 250 meters        |
| Employees   | 250 - 800 meters                     | 250 - 800 meters        |

TABLE 5. MAXIMUM ACCEPTABLE WALKING DISTANCES TO PARKING FACILITIES

A. Living main group

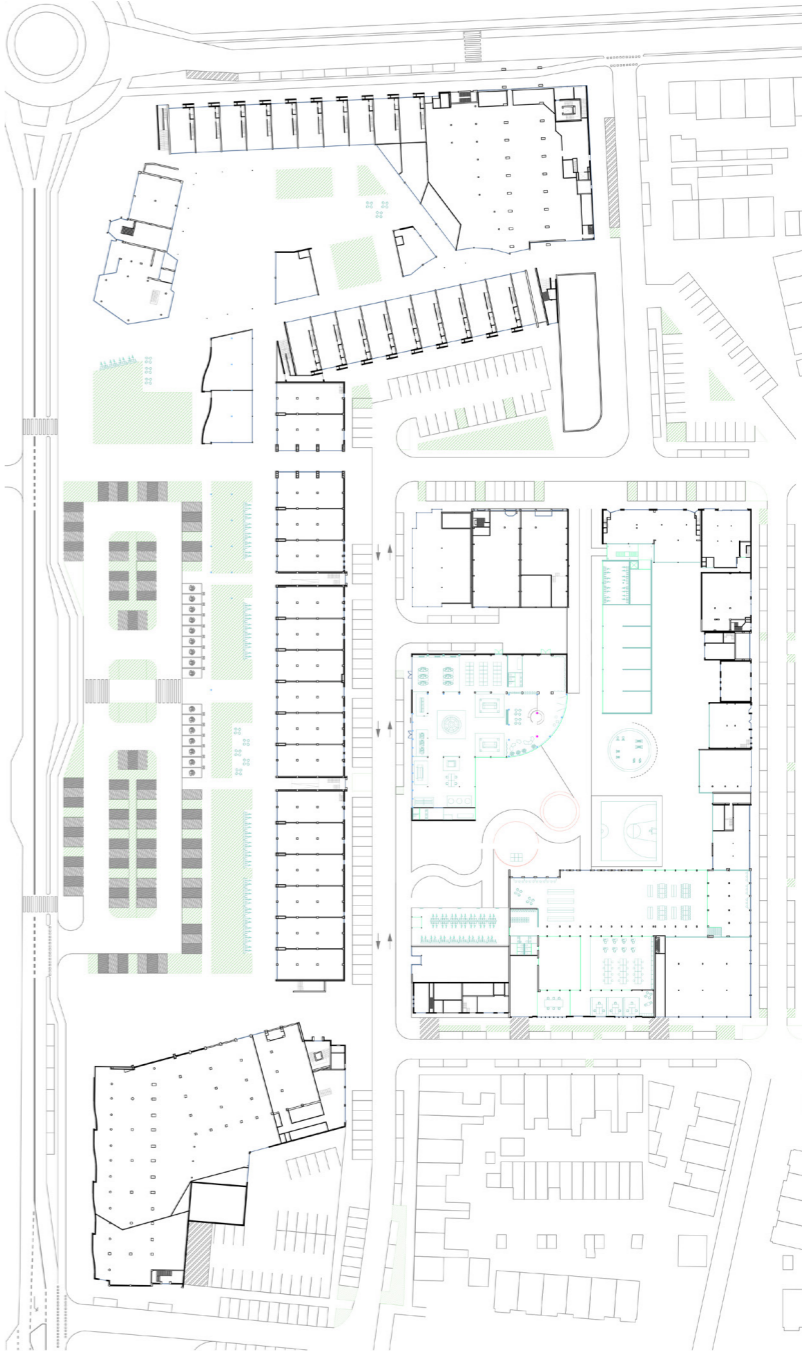
| Main group Living  | Zone a | Zone B | Zone C | Zone D | Unit             | Visitors part | Comments   |
|--|--------|--------|--------|--------|------------------|---------------|--|
|  |        |        |        |        |                  |               |  |
| Ground-level house or apartment (expensive) > 130 m² GFA | 1.1    | 1.3    | 1.7    | 1.8    | per home         | 0.3           |  |
| Ground-bound house or apartment (middle) 70 - 130 m² GFA | 1.0    | 1.2    | 1.6    | 1.6    | per home         | 0.3           |  |
| Ground-bound house or apartment (inexpensive) <70 m² GFA | 0.9    | 1.1    | 1.4    | 1.5    | per home         | 0.3           |  |
| Social housing (social rental apartments)*               | 0.8    | 0.8    | 0.8    | 0.8    | per home         | 0.3           |  |
| Social housing (ground-level housing for social rent)*   | 0.9    | 1.1    | 1.25   | 1.25   | per home         | 0.3           |  |
| Service flat / sheltered housing                         | 0.3    | 0.8    | 0.9    | 1.0    | per home         | 0.2           | Self-contained home with limited care facilities, such as room rental or studios |
| Living unit <35 m² GFA independent living                | 0.5    | 0.5    | 0.6    | 0.6    | per housing unit | 0.2           |  |
| Living unit <35 m² GFA for not living on your own        | 0.2    | 0.2    | 0.3    | 0.3    | per housing unit | 0.2           | for example student housing  |
| Protected housing / nursing and care home                | 0.5    | 0.5    | 0.5    | 0.5    | per housing unit | 0.3           |  |

C. Main group shopping and groceries

| Main group Shopping and groceries                                    | Zone a | Zone B | Zone C | Zone D | Unit              | Visitors part | Comments                                       |
|--|--------|--------|--------|--------|-------------------|---------------|--|
|  |        |        |        |        |                   |               |  |
| Shops downtown Tilburg (zone A)                                      | 3.1    | na     | na     | N/A    | per 100 m2 GFA N/ | 90%           |  |
| Shops district center  | na     | 3.3    | 4.1    | A      | per 100 m2 GFA    | 80%           | Ex. Heijhoef, Blaak, Westermarkt, Wagnerplein. |
| Shops in the neighborhood center (incl. ribbons and solitaire shops) | na     | 2.1    | 2.7    | N/A    | per 100 m2 GFA    | 70%           | Ex. Bredaseweg, Korvelseweg, Berkel-Enschot    |
| Supermarket  | 2.5    | 3.6    | 4.4    | N/A    | per 100 m2 GFA N/ | 95%           |  |
| Supermarket XL   | 4.9    | 5.8    | 6.7    | A      | per 100 m2 GFA    | 85%           | sales floor area > 2,500 m2                    |
| Construction market  | na     | 1.5    | 2.0    | 2.2    | per 100 m2 GFA    | 90%           | sales area outside must be included            |
| Garden center  | na     | 2.0    | 2.3    | 2.6    | per 100 m2 GFA N/ | 90%           |  |
| Furniture boulevard, residential boulevard, home shops               | na     | 1.6    | 2.0    | A      | per 100 m2 GFA    | 95%           |  |



EXISTING PARKING - 473



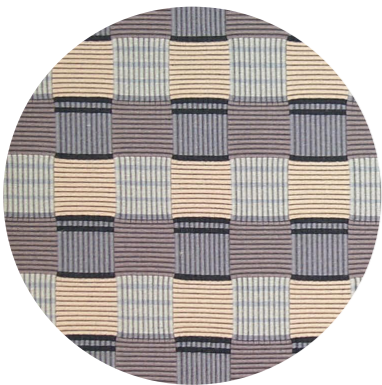
PROPOSED PARKING - 401  
INCLUDING 16 ELECTRICAL CHARGING STATIONS

TEXTILE PATTERN INSPIRED PUBLIC SPACES



Space for social gatherings / events.

Atmosphere:  
-festive  
-scattered elements  
-open



Space for parking

Atmosphere:  
- rigid  
-industrial  
-monotone

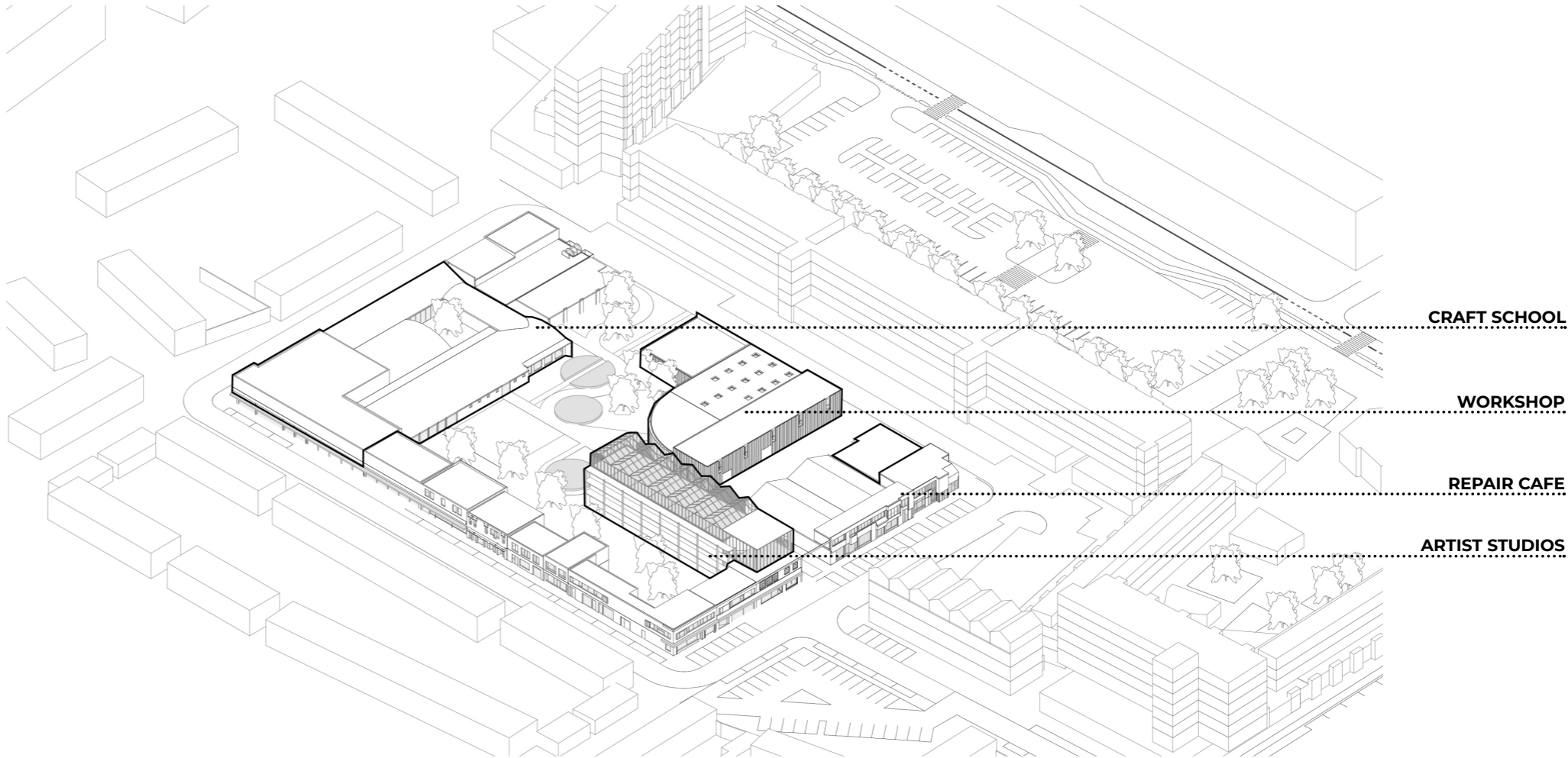


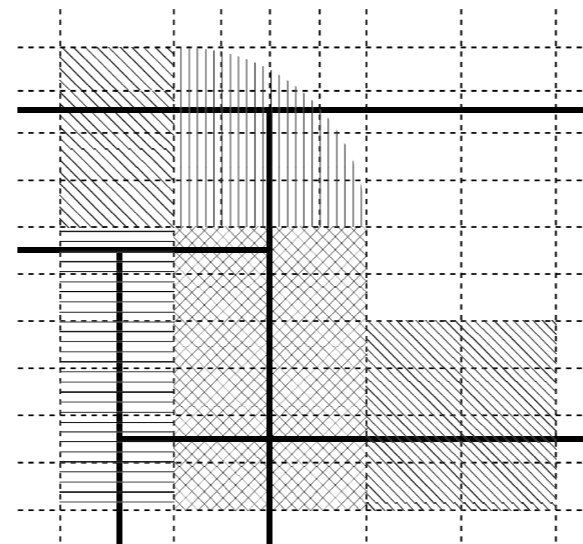
Active space ( Textile park)

Atmosphere:  
- fluid  
- green  
- colourful

TEXTILE 2.0 PARK

Considering the negative effects of fast fashion as outcome of consumerism, it was decided to create a textile park as part of the shopping centre. Textile is also an element of local context as it was an important element in the history of Tilburg. The park focuses on recycling and repairing textile, supporting circular economy goals.





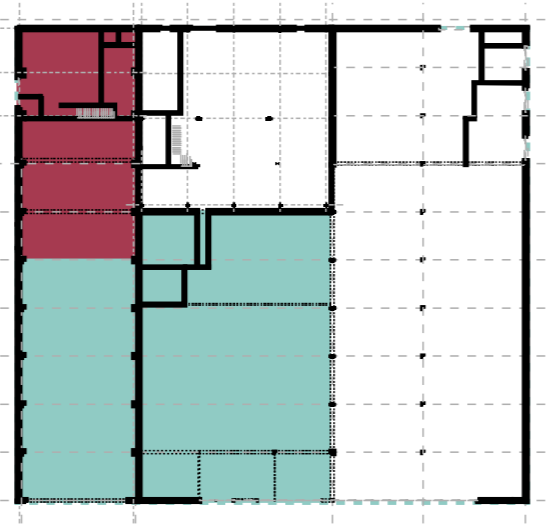
BUILDING

TEXTILE WORKSHOP

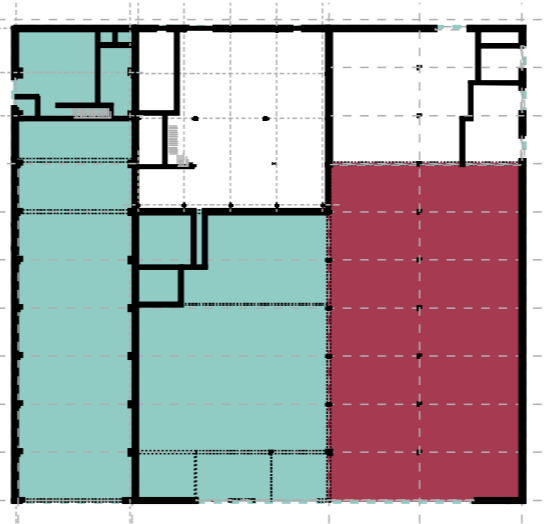
BUILDING DEVELOPMENT



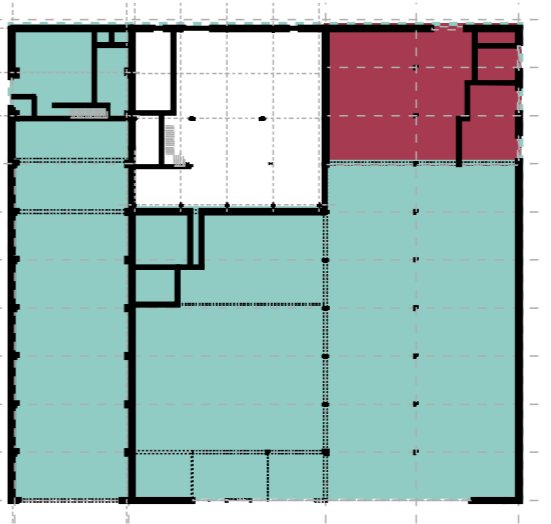
1961-1962



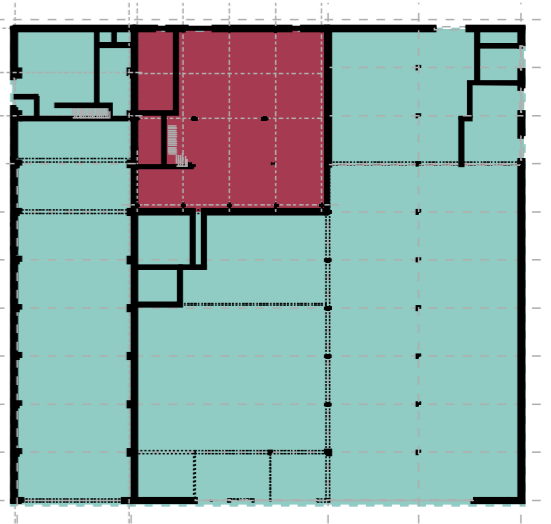
1965



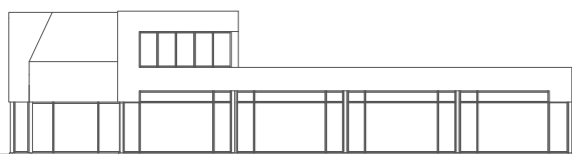
1970



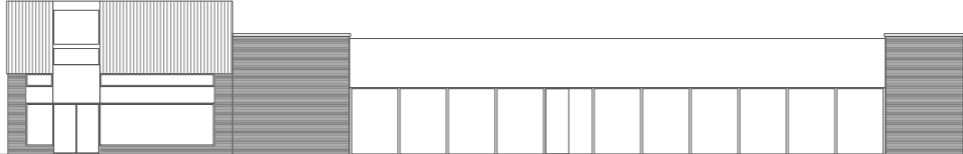
1991



1995

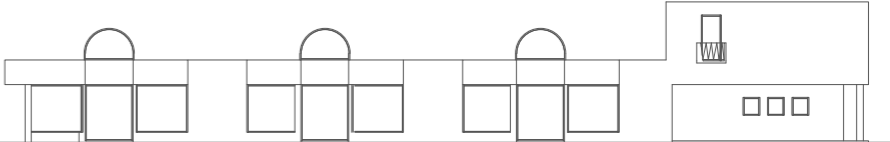


1982

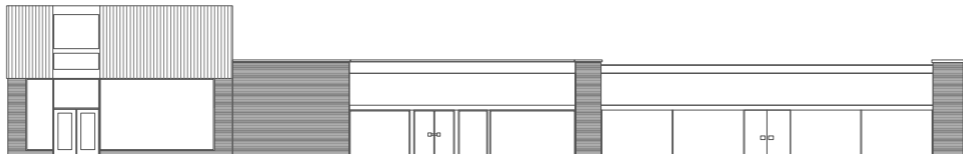


1982

1991



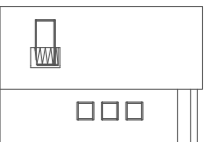
1980



1973

1971

1970



1957



1962

1961

BUILDING DEVELOPMENT



1961 - 1970



1973 - 2009



1973 - 2009

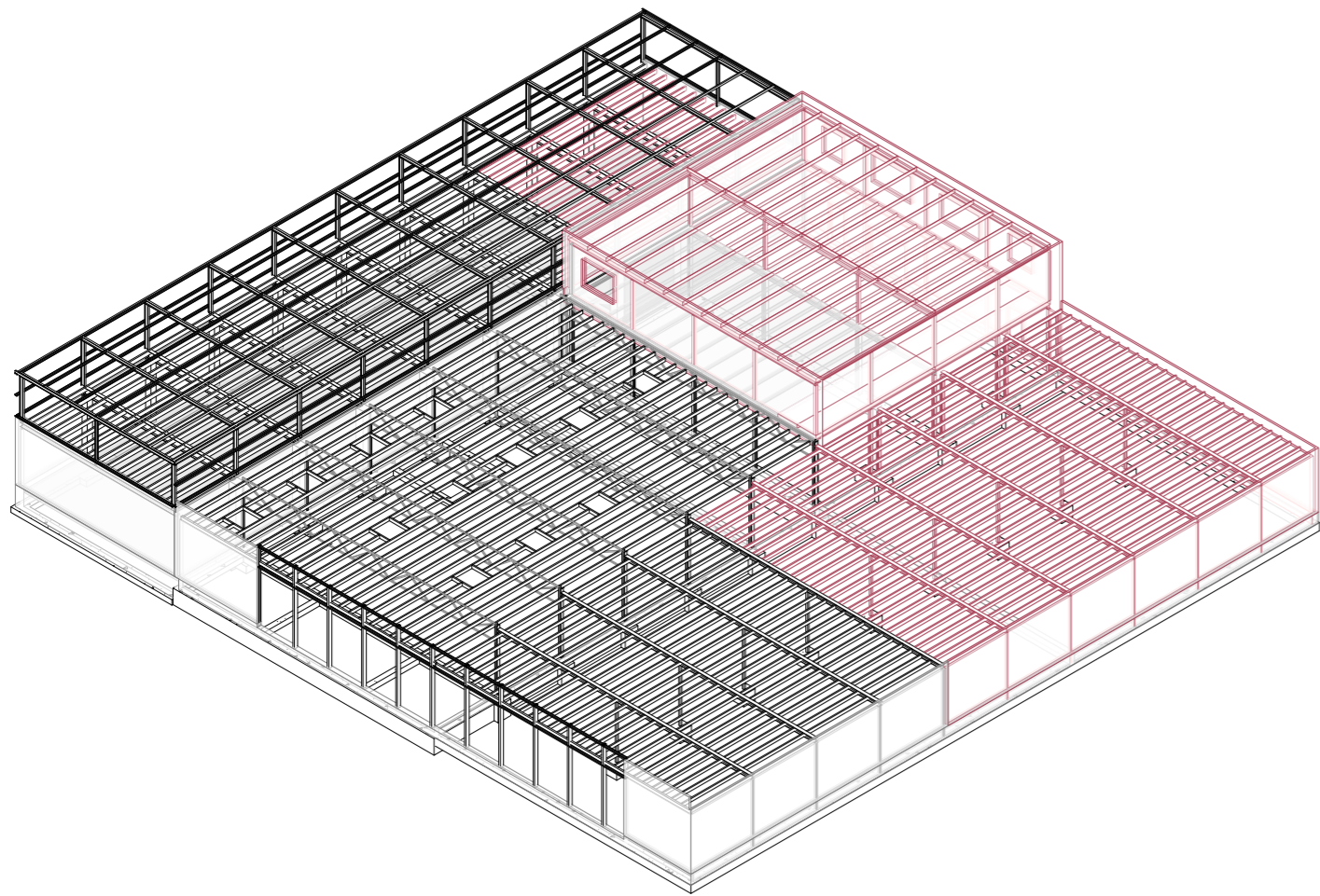


1973 - 2009

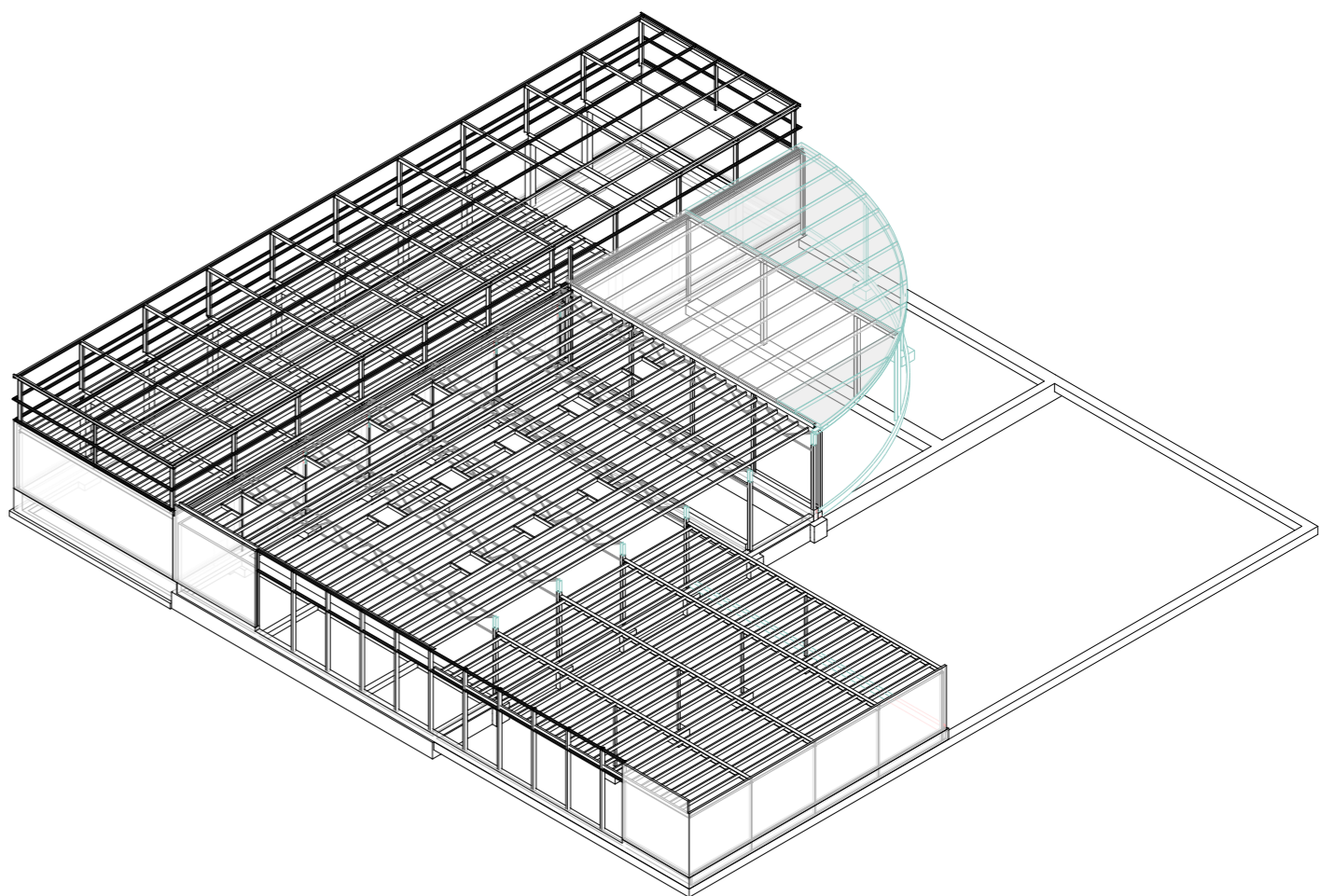
SOURCE: REGIONAAL ARCHIEF TILBURG

DEMOLISHMENT PLAN

DEMOLISHED

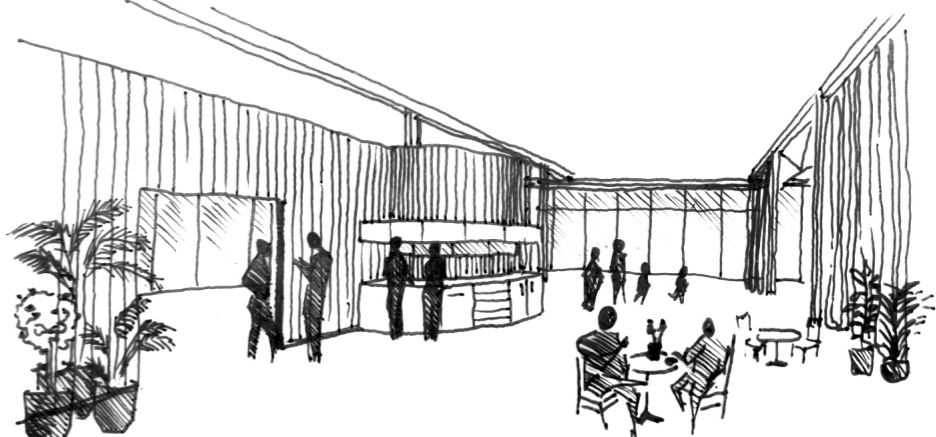
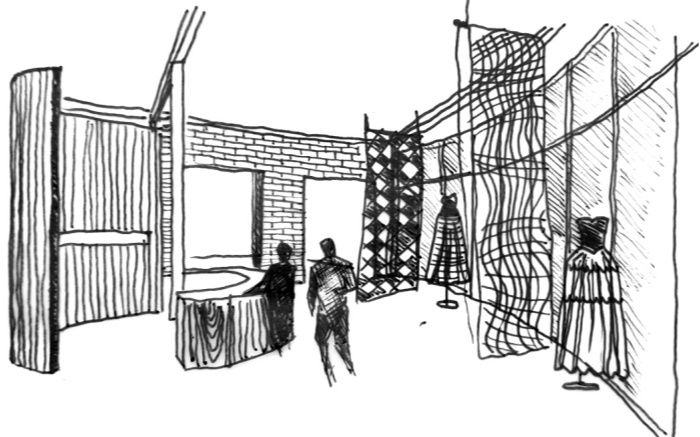
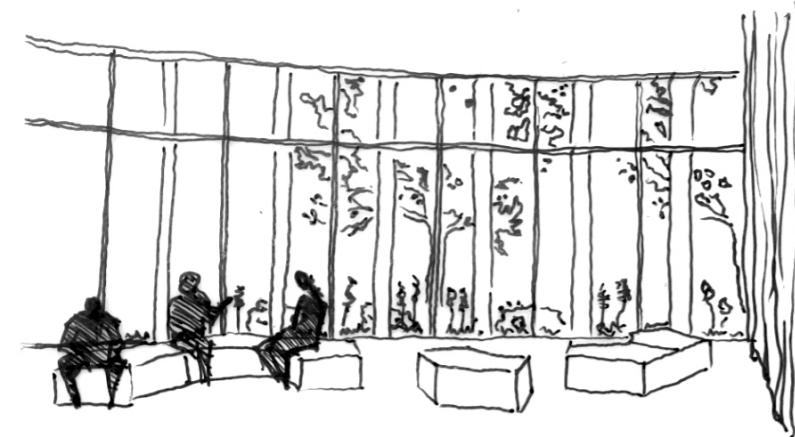
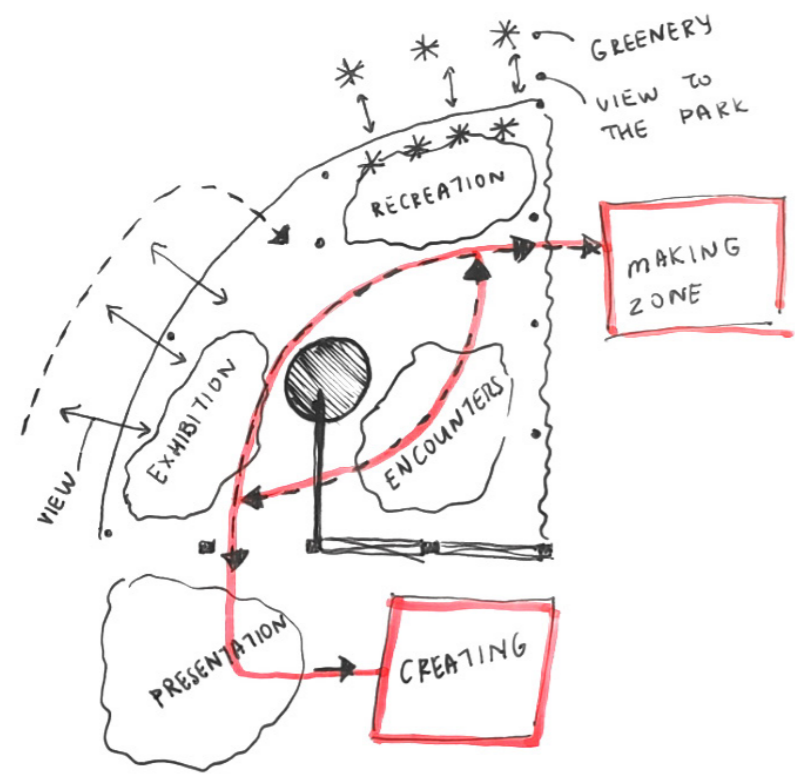


NEW

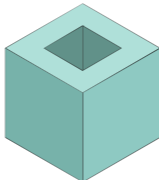


# FROM CONSUMERIST SPACE TO CREATIVE SPACE

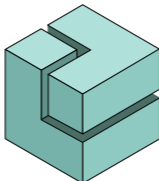
As in the design of consumerist spaces, there are also certain patterns behind the design of creative spaces. Thorning, Mueller, Desmet and Badke-Schaub (2018) proposed mechanisms for facilitating design activities and improving design processes through the spatial environment. Based on these principle the textile workshop building was organised in a way that the route from creating space (studio) to making space (workshop) always goes through inspiration space (presentation area and lobby). The inspiration space includes zones for temporary exhibitions, recreation and community kitchen for encounters.



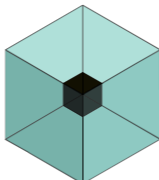
## SPACE TYPE



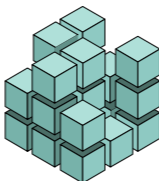
**1. PERSONAL SPACE**  
allows for concentrated 'heads-down' work (thinking, reading, writing), deep work, and reflection; requires reduced stimulation to avoid distraction.



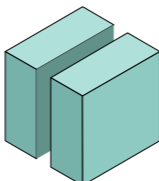
**2. COLLABORATION SPACE**  
is used for group work, workshops, face-to-face discussions, client meetings, or student-teacher consultations.



**3. PRESENTATION SPACE**  
is used to share, present, and consume knowledge, ideas, and work results in a one-directional way (presentations or exhibitions)

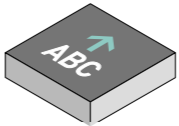


**4. MAKING SPACE**  
is used for model making and building; allows experimentation, play, noise, and dirt.

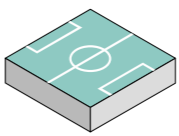


**5. INTERMISSION SPACE**  
connects other space types; is used for breaks, recreation, and transfers; includes hallways, stairs, cafeterias, and outdoor areas.

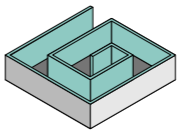
## SPATIAL QUALITY



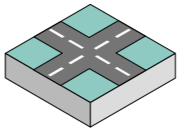
**A: KNOWLEDGE PROCESSOR**  
space can store, display, and foster the transfer of information and knowledge (tacit, explicit, and embedded knowledge).



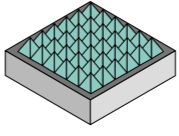
**B: INDICATOR OF CULTURE**  
space suggests a specific behavior, either through common sense, written or unwritten rules, rituals, labels, and signs.



**C: PROCESS ENABLER**  
space can provide specific spatial structures or technical infrastructure that might guide or hinder the work process.



**D: SOCIAL DIMENSION**  
space influences social interactions and facilitates meetings and personal exchanges.

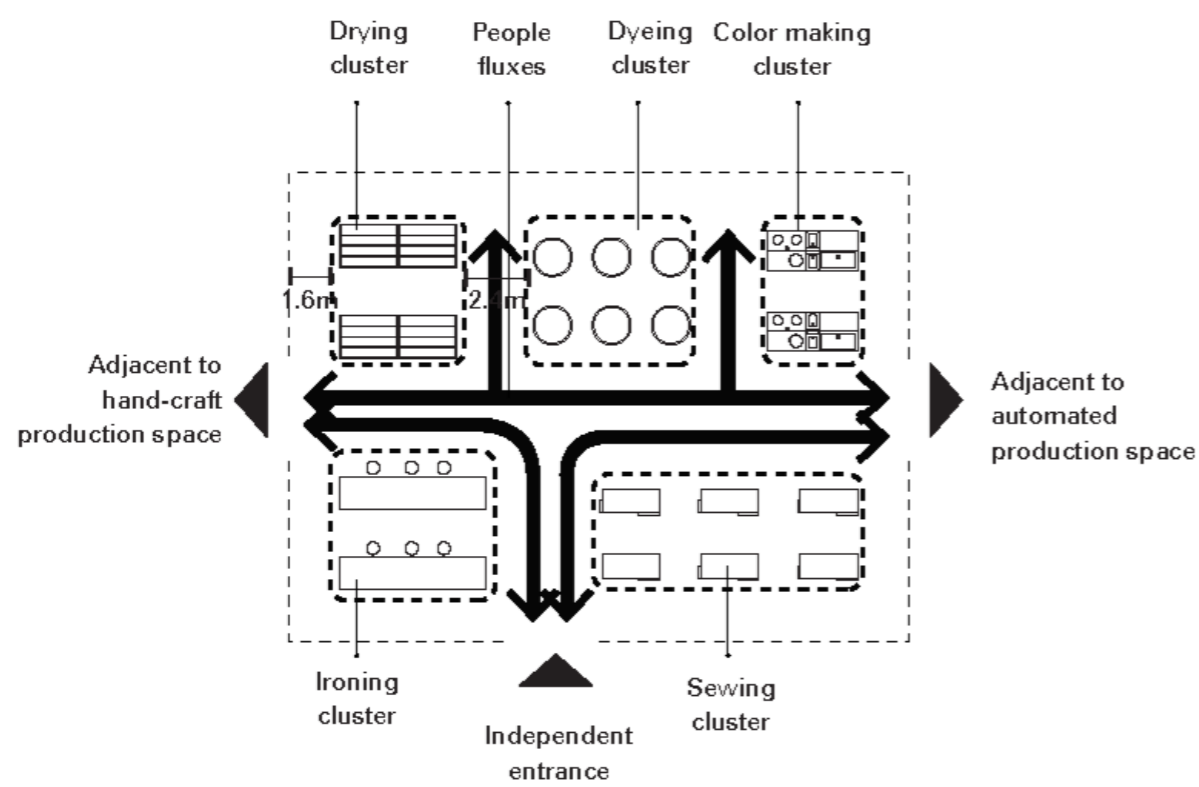


**E: SOURCE OF STIMULATION**  
space can provide certain stimuli (views, sounds, smells, textures, materials, etc.).

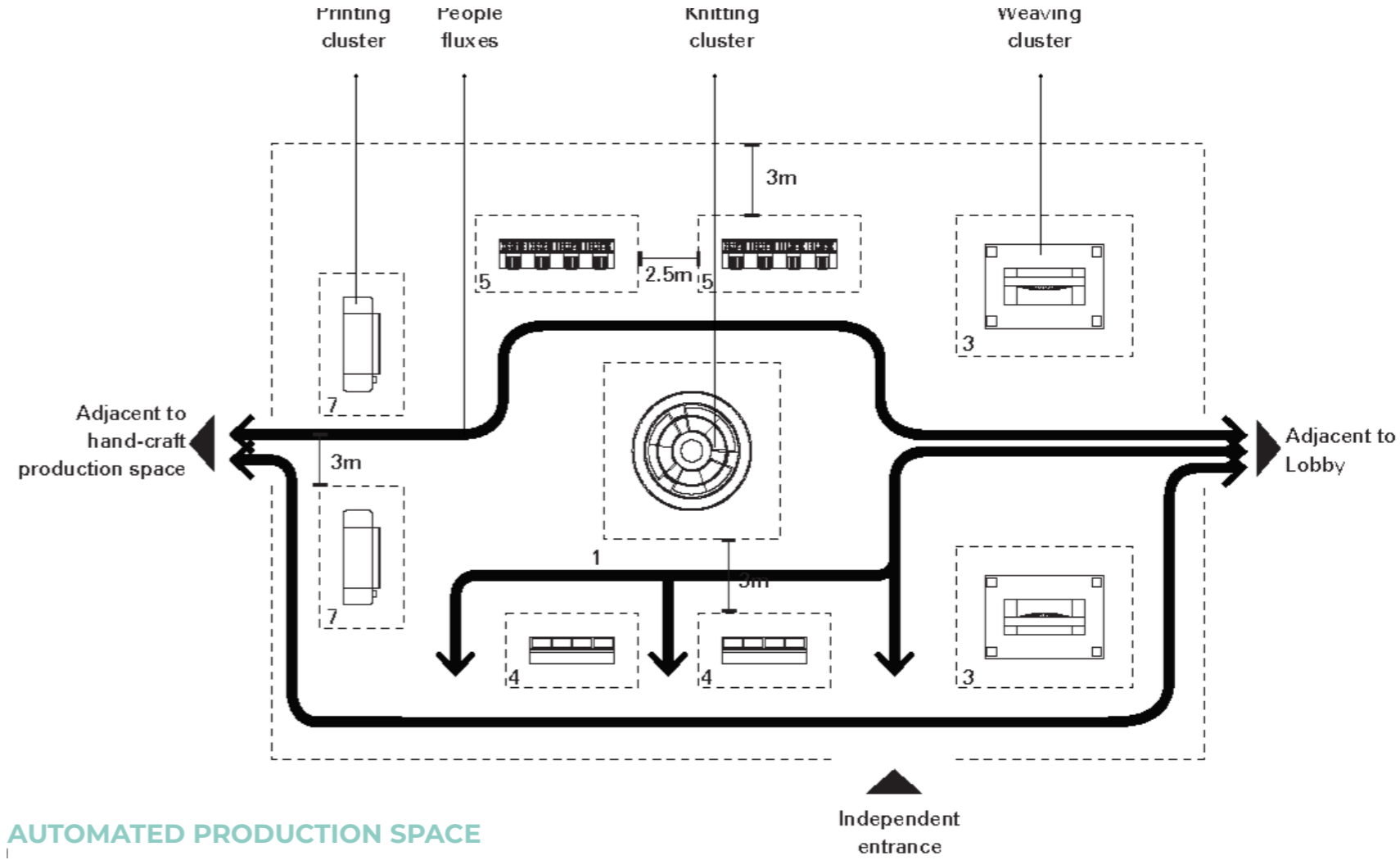
TYPOLGY OF CREATIVE SPACES  
(THORING, MUELLER, DESMET AND BADKE-SCHAUB, 2018)

TEXTILE WORKSHOP - MACHINERY

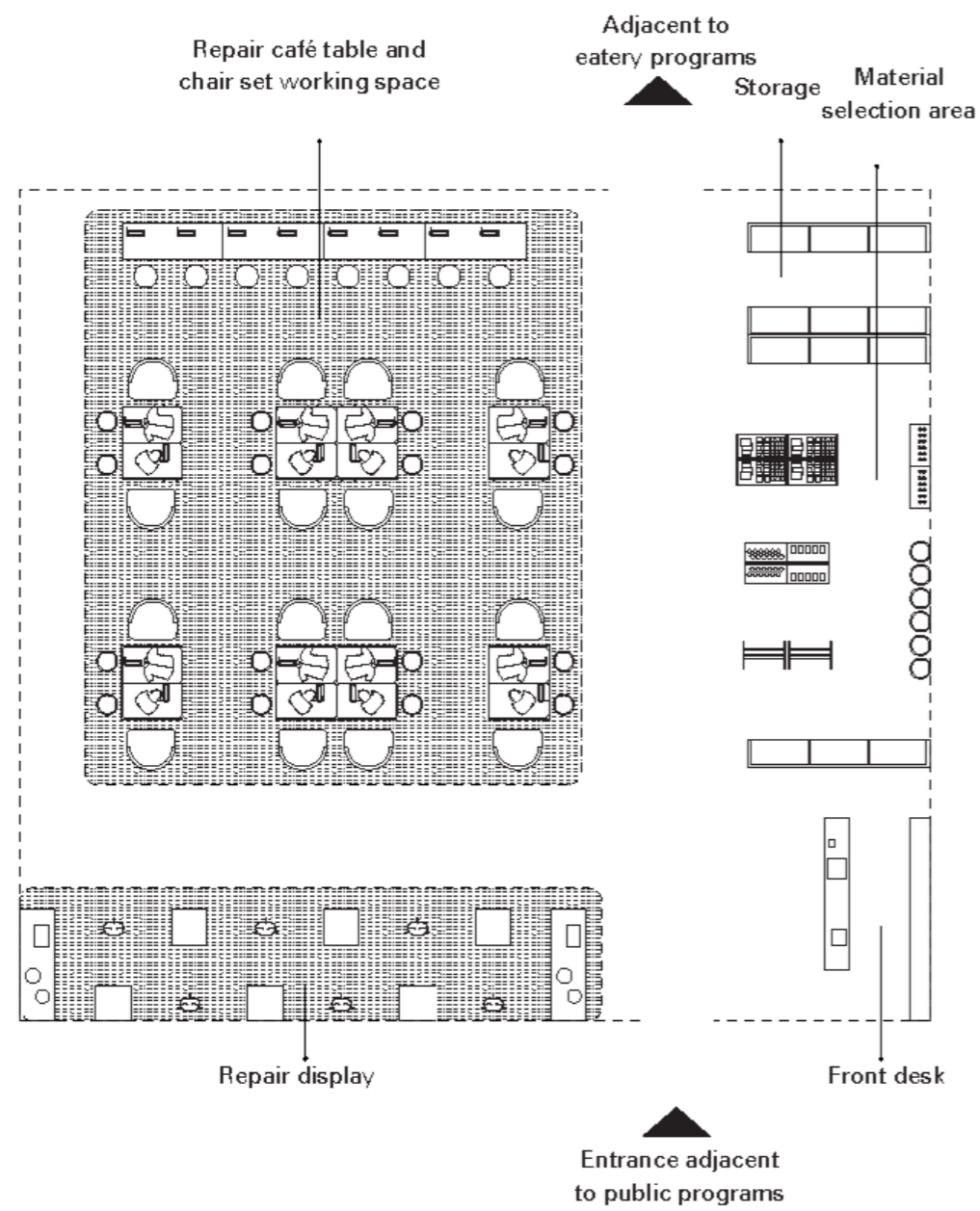
SOURCE: FASHION HOUSE, THE BERLAGE, TU DELFT.  
[https://thesisinprogress-theberlage.nl/pattern-book\\_design-and-implementation](https://thesisinprogress-theberlage.nl/pattern-book_design-and-implementation)



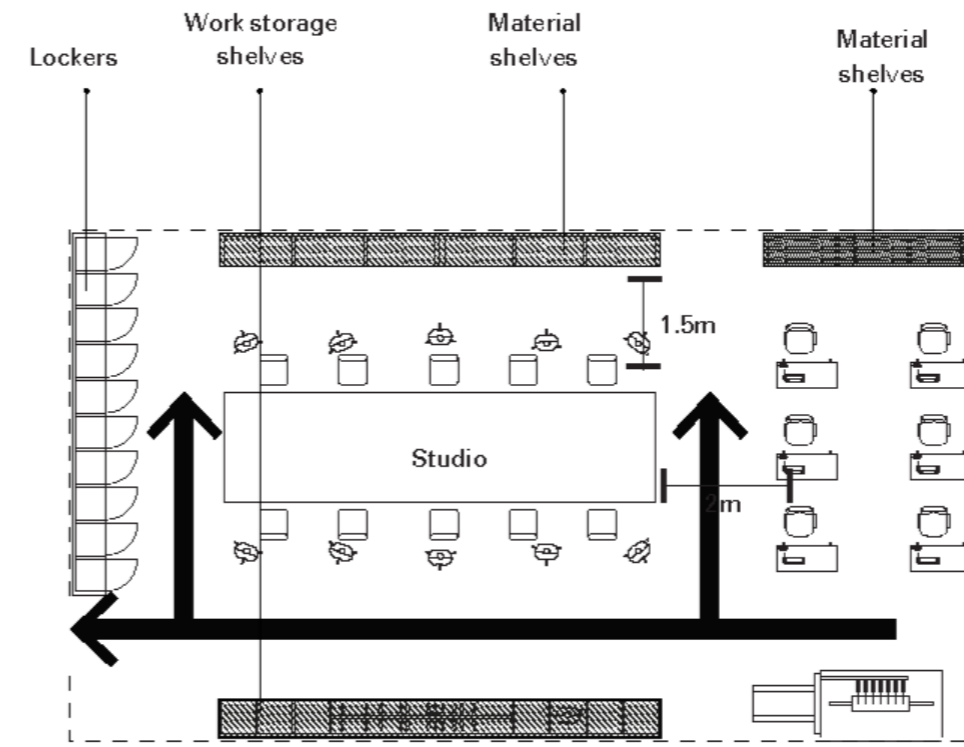
HAND-CRAFT PRODUCTION SPACE



AUTOMATED PRODUCTION SPACE

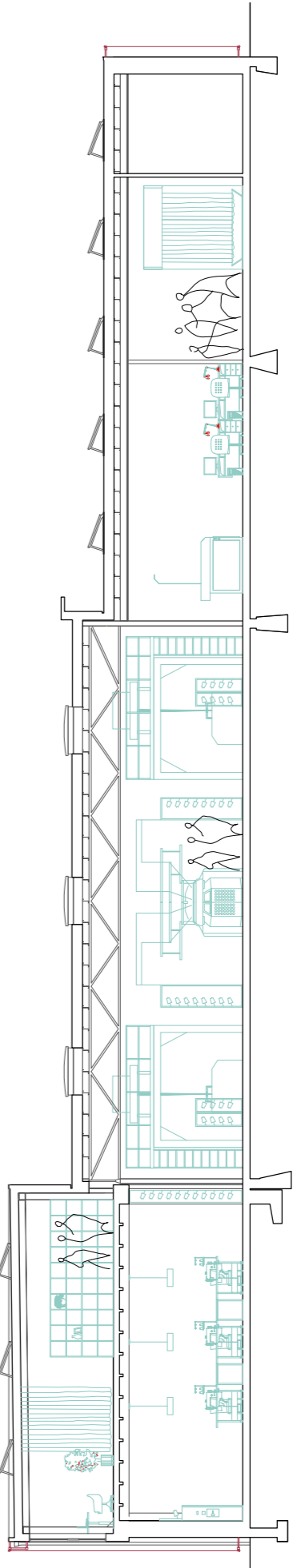
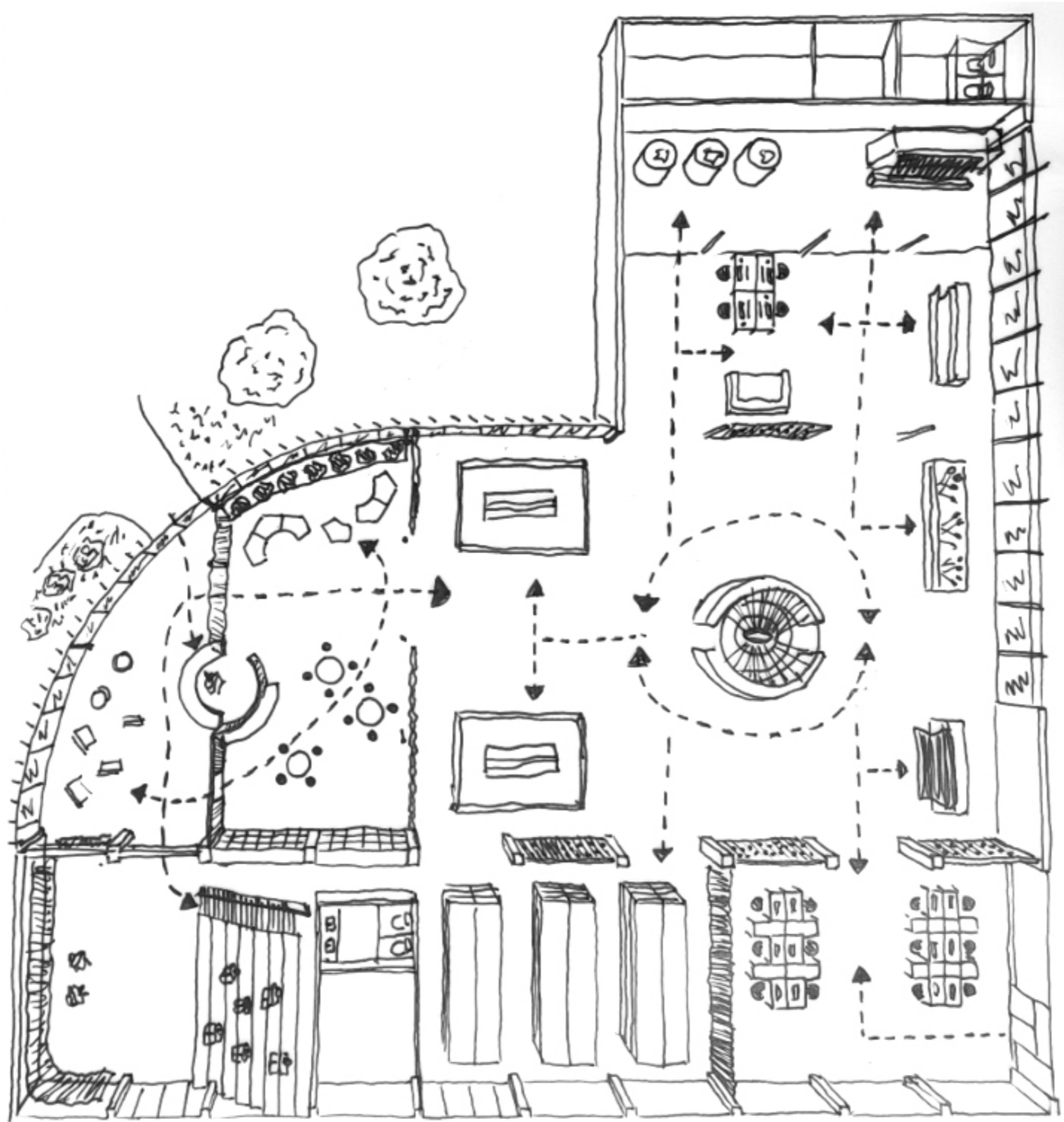


REPAIR CAFE

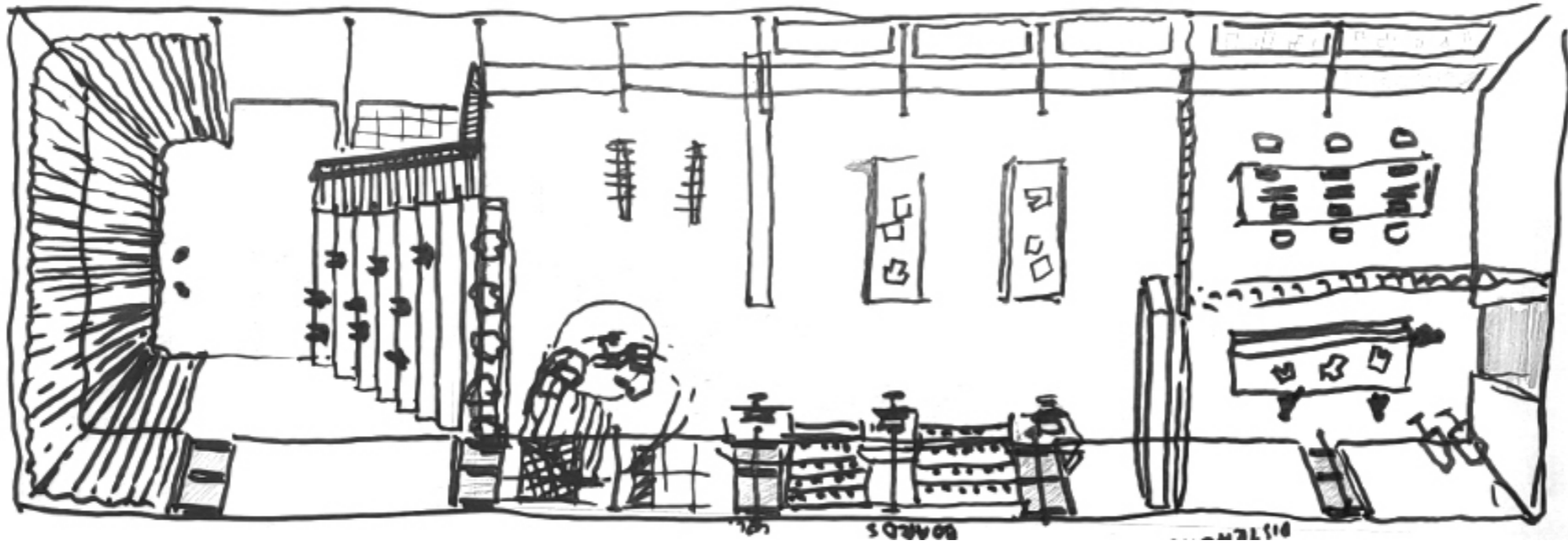
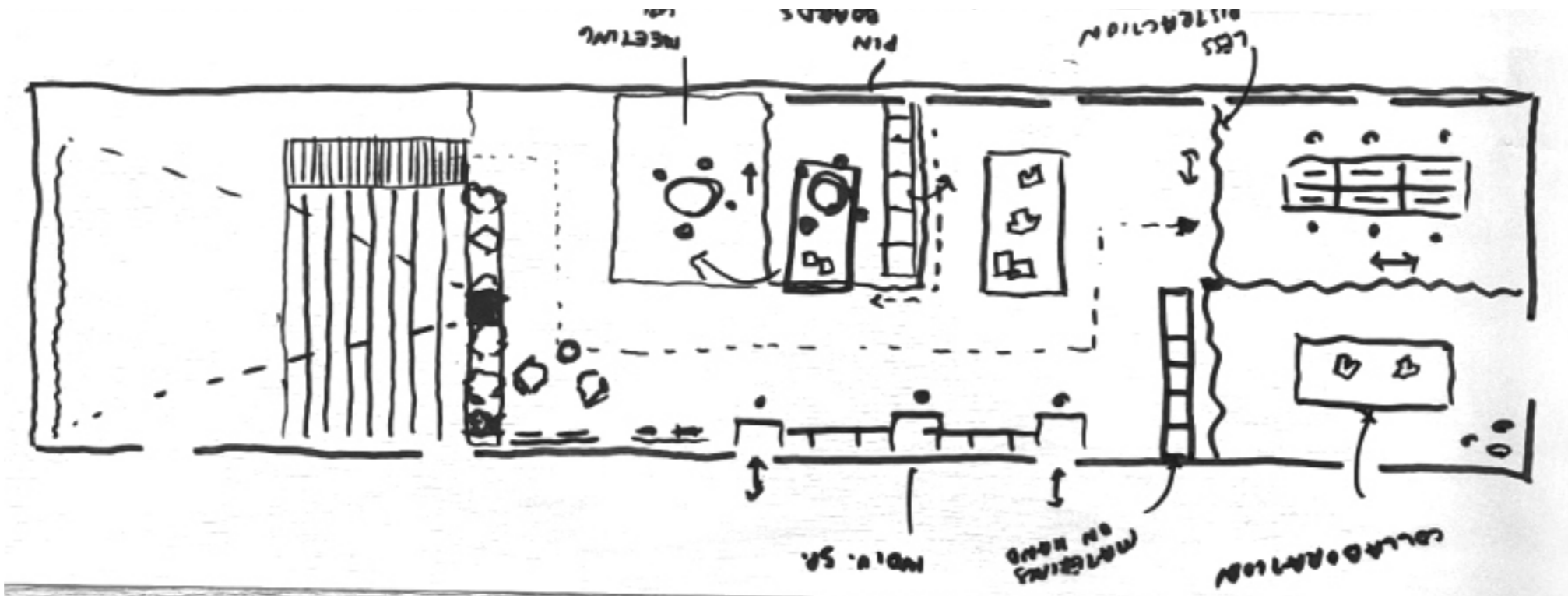


STUDIO

WORKSHOP PLAN - GROUND FLOOR



STUDIO PLAN - FIRST FLOOR



TEXTILE WORKSHOP SPACE

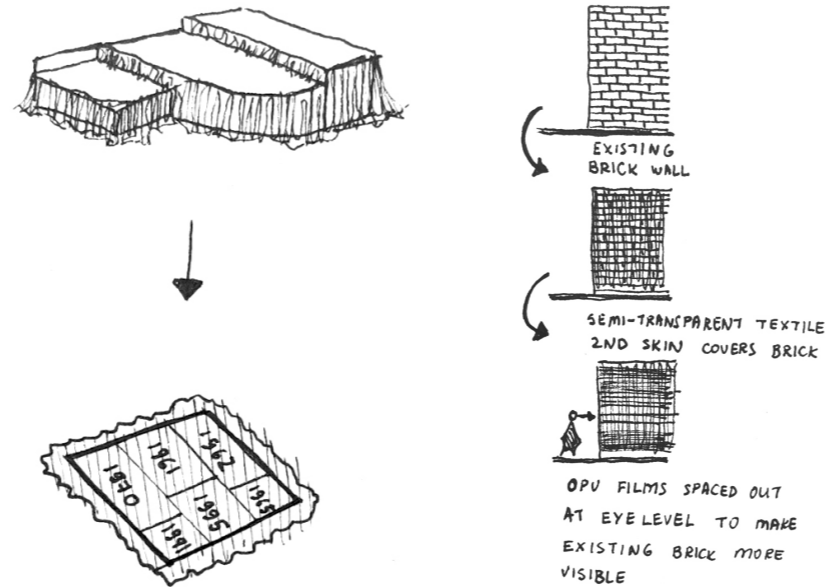


EXTERIOR CONCEPT

Coming from the retail typology, the building currently has a clear difference between front and back, where the front is more open and coherent, representing the shop and the back is closed and more messy, used only for logistics. Therefore, it was decided to create a new quality for the back through intervention, keeping the front facade as it is.

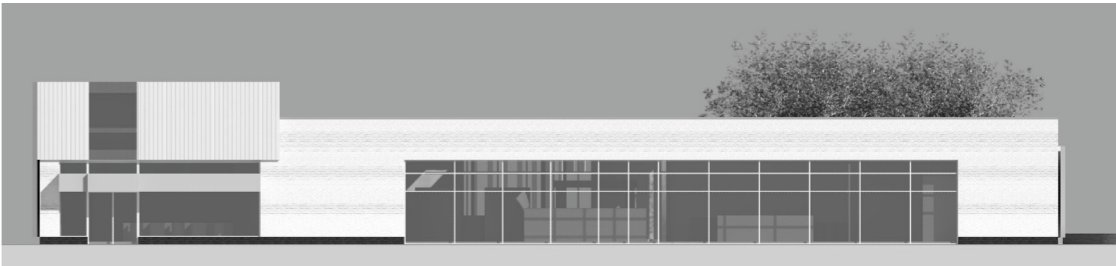
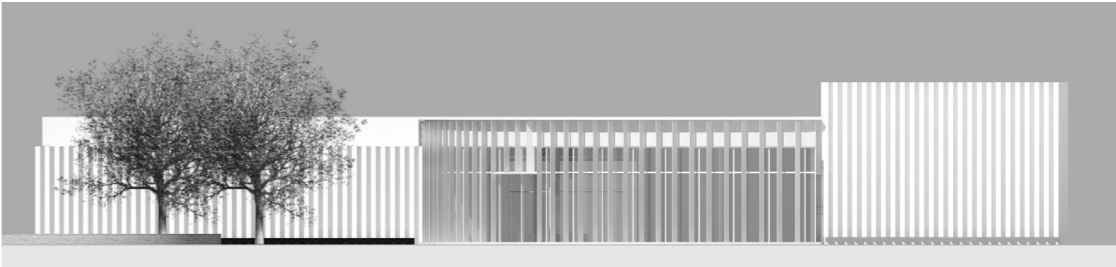
Since textile is an important element of Tilburg's identity, it is proposed to wrap the building in textile, not only representing the function of textile workshop but also introducing a new element in the site with the direct link to the local context. The use of textile creates a new value for the building.

The textile skin is combined with solar films, creating a pattern, which spaces out at eye level. This makes it possible to see the original facade through the semi-transparent textile with less distraction from solar elements.



THE IDEA IS TO WRAP A BUILDING IN TEXTILE, CREATING A COHERENT LOOK FOR THE WHOLE BUILDING

THE PATTERN OF SOLAR FILMS



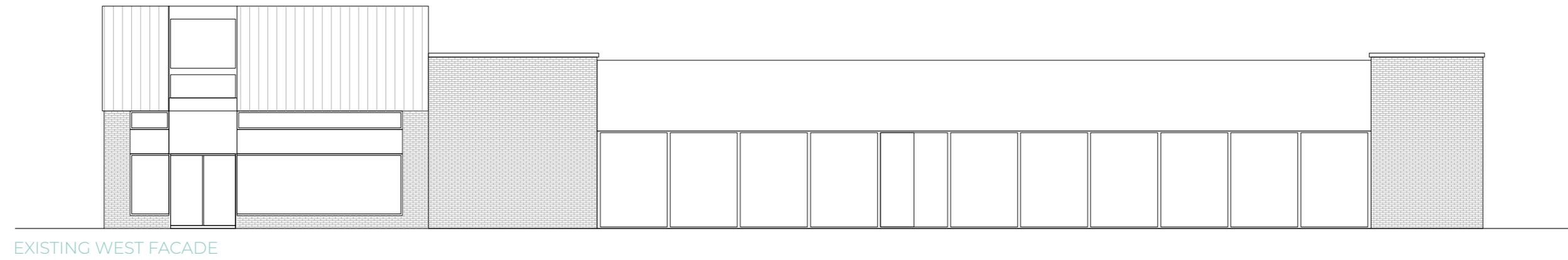
PROPOSED DESIGN FOR THE FRONT (BELOW) AND BACK (TOP) FACADE



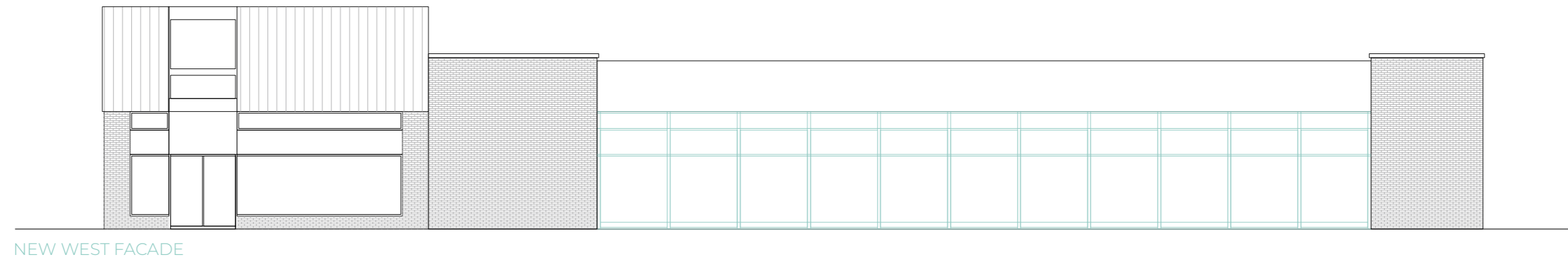
THE FRONT OF THE BUILDING IS MORE OPEN



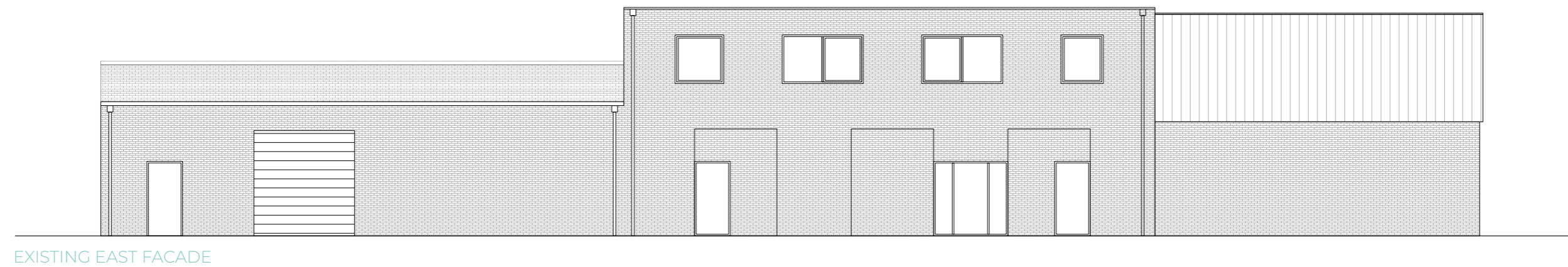
THE BACK OF THE BUILDING IS USED FOR LOGISTICS, CREATING NOT AESTHETICALLY PLEASING EXTERIOR.



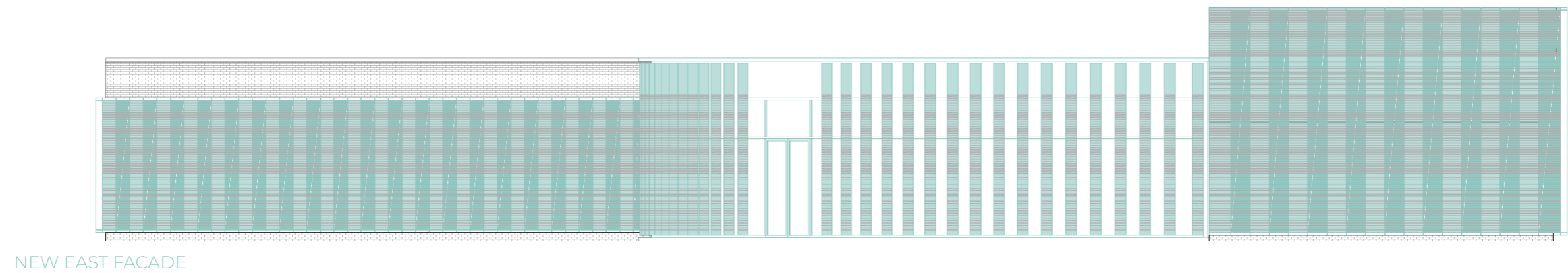
EXISTING WEST FACADE



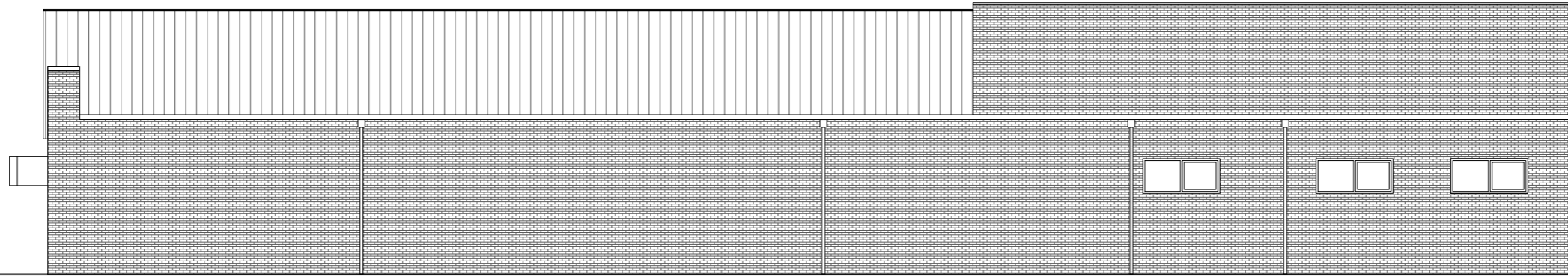
NEW WEST FACADE



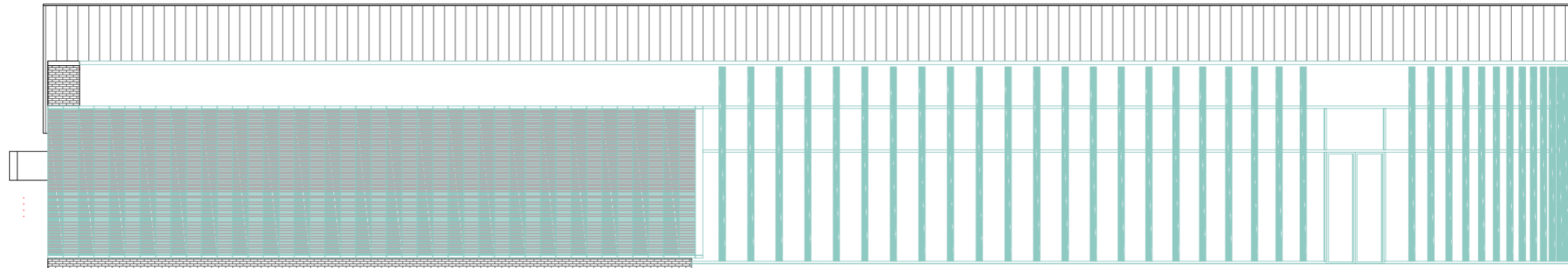
EXISTING EAST FACADE



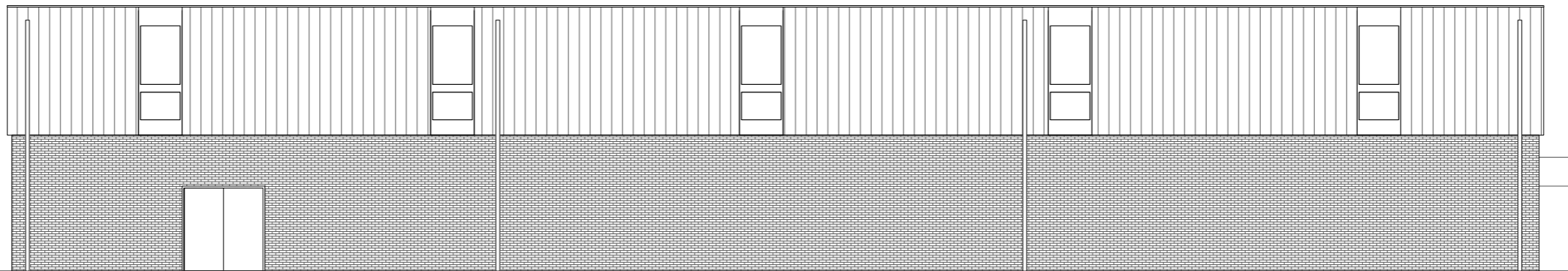
NEW EAST FACADE



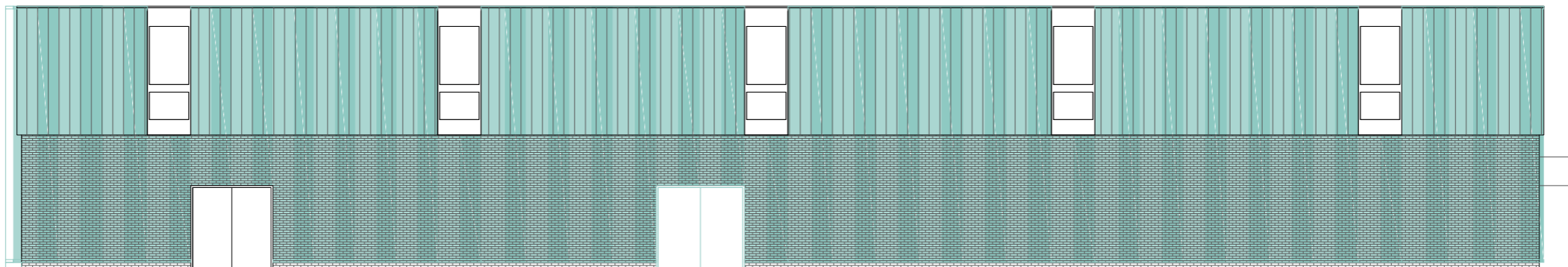
EXISTING SOUTH FACADE



NEW SOUTH FACADE

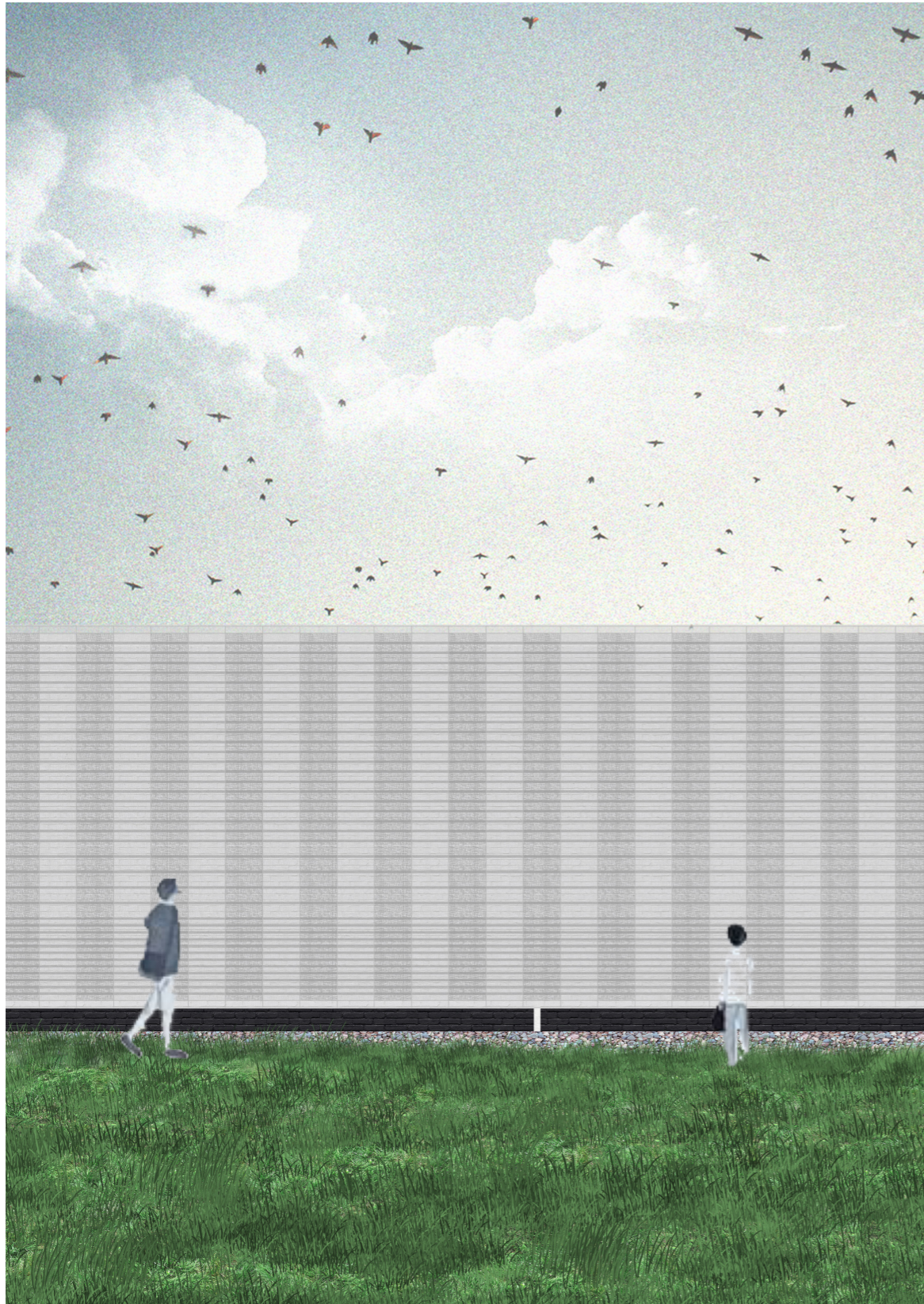


EXISTING NORTH FACADE



NEW NORTH FACADE

## DAY / NIGHT FACADE IMPRESSION



THE SOLAR FILMS ARE LESS DENSE ON EYE LEVEL, MAKING IT POSSIBLE TO BETTER OBSERVE ORIGINAL FACADE BEHIND



DURING THE NIGHT ORIGINAL FACADE IS LIGHTEN UP AND CAN BE BETTER SEEN THROUGH TEXTILE

BEFORE / AFTER COMPARISON



BEFORE



BEFORE



AFTER



AFTER

## TEXTILE FACADE

Textile is used for the exterior of the building. It has very low embodied carbon. Since textile is a light-weight material, it reduces transport energy and overall cost for installation. It can also make building more nergy-efficient. Acting as a second skin it can retain up to 80% of the heat from the sun (Printable, n.d.).

There are many types of architectural fabrics in common use today, the two most used types are: PVC-coated polyester and PTFE-coated glass fabric (Drew, 2008). The coating provides protection against weathering agents, and the fabric weave within the coating is the load-carrying element (Van Dongen et al., 2022).

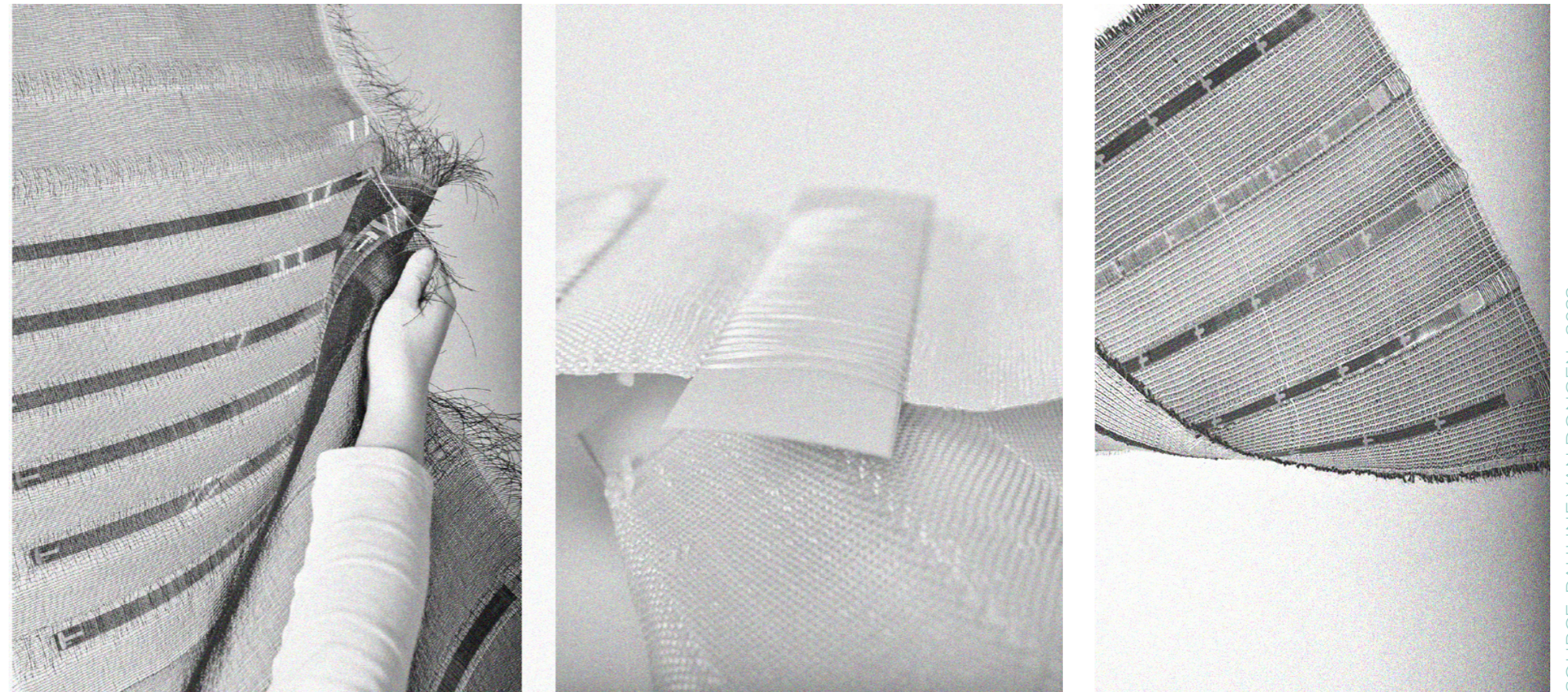
The fabric can also be made from recycled yarn. Companies like Morssinkhof Sustainable Products make industrial yarn from recycled polymer which comes from used bottles and other post-consumer packaging. After collection, the polymer is processed into flakes, and later into polymer granulate. Morssinkhof Sustainable Products turns the granulate into durable rPET industrial yarn (Morssinkhof Sustainable Products, n.d.).

This material has a technical lifespan of 18-30 years (Printable, n.d.). It can be fully recycled at the end of its cycle.

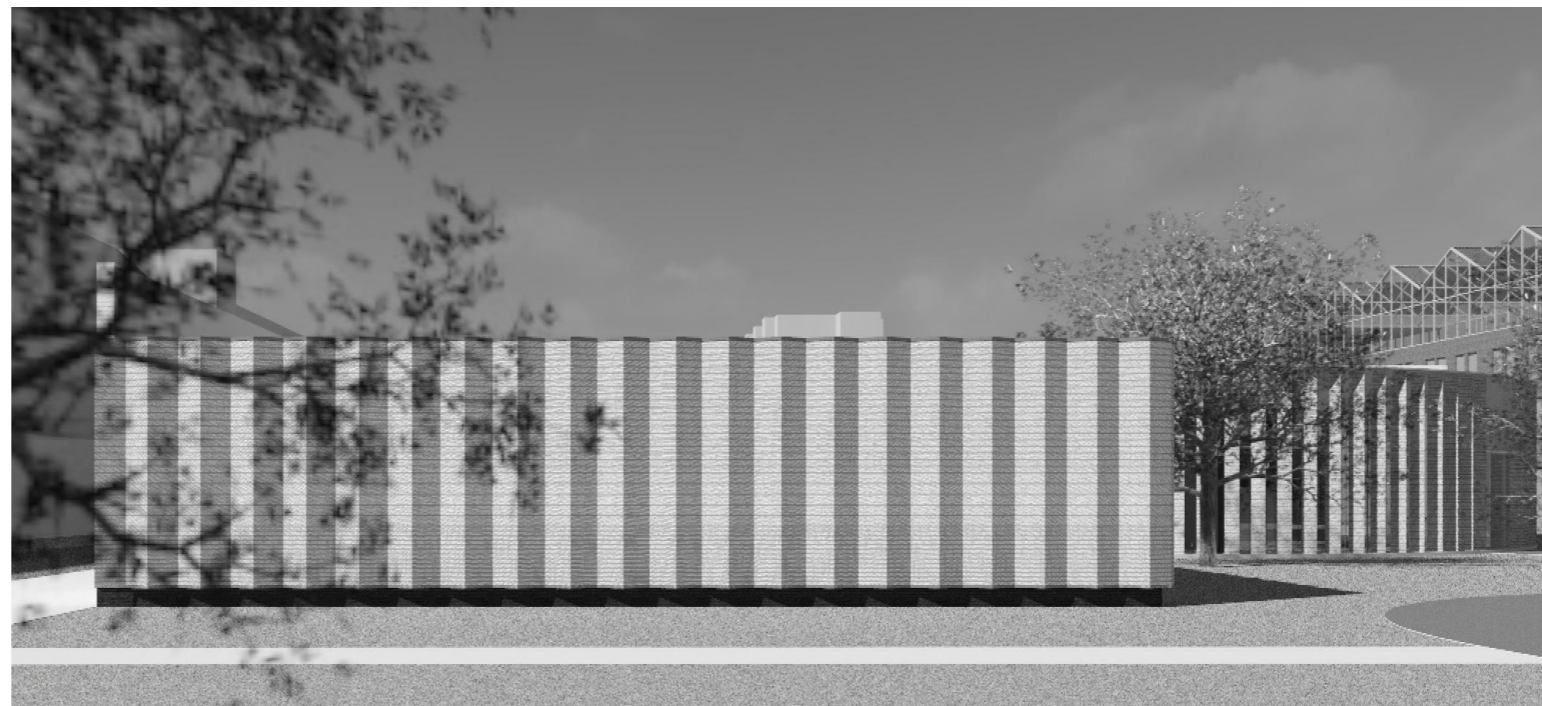
Today's technologies also offer a possibility to combine textile and solar cells, making it possible to harvest solar energy using vertical surfaces of the building. It is especially important for countries like The Netherlands, where low winter sun generates more solar energy on the vertical surface than on roofs (Van Dongen et al., 2022, p. 3). Currently Pauline Van Dongen and her colleagues are developing Suntex, an architectural textile which combines thin-film solar panels and electrical circuits directly in the weaving process of the textile.

Suntex is fully recyclable and the solar cell structures can be separated from the textile, with a lifespan of 10 - 15 years.

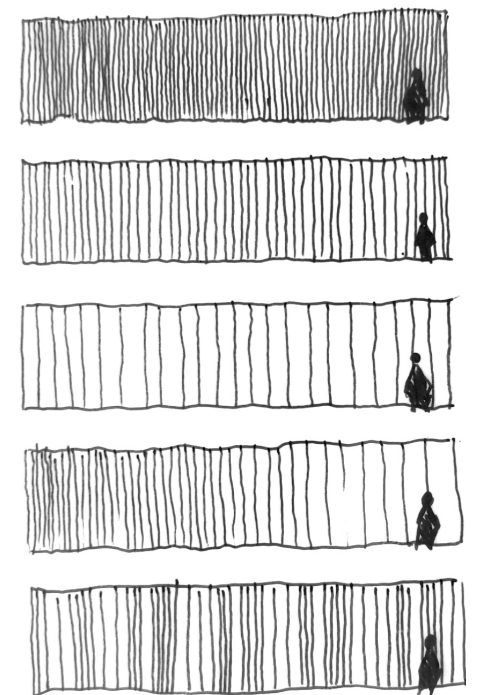
However, the integration of solar cells in textile weaving process changes the tensile and bending properties of the textile. The integration of electrical hardware components in a soft flexible textile can cause stress concentrations and weak points (Van Dongen et al., 2022). The Suntex is currently beign developed to mitigate these limitations.



SUNTEX SAMPLES WITH INTEGRATED SOLAR FILMS



TEXTILE IS UDES FOR THE EXTERIOR OF THE BUILDING.



SOURCE: PAULINE VAN DONGEN, 2022

## ORGANIC SOLAR CELLS

Suntex uses organic photovoltaic film (OPV), which is a flexible, thin-film material produced in a low-carbon, roll-to-roll manufacturing process, and, it is composed of organic, non-toxic materials which are abundant and can be recovered at end-of-life (Van Dongen et al., 2022). The material has a service life of up to 20 years.

OPV is an innovative solution developed by ASCA, company based in France and Germany.. The ASCA® film has a weight of less than 500g/m<sup>2</sup>, transparency of 20% to 50% and can be designed in different colours and shapes. OPV film can produce approximately 20-50 Wp /m<sup>2</sup> (depending on chosen colour). However, the company has recently achieved outputs of 70 Wp /m<sup>2</sup> in pilot scale (ASCA®, Efficiency Increase, 2021).

The ASCA® film offers a positive temperature coefficient and does not experience any efficiency loss with rising temperatures (ASCA®, Efficiency Increase, 2021).

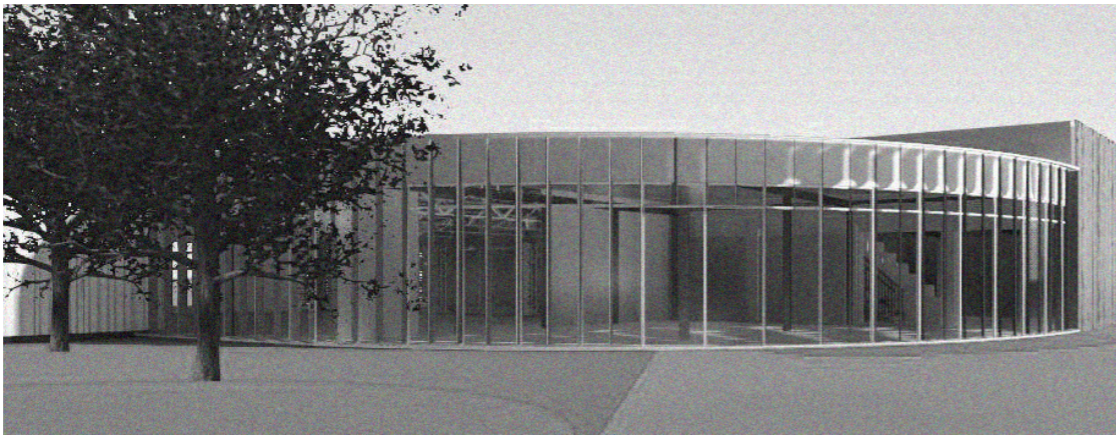
Since it requires little energy during manufacturing, it can have an energy payback time (the time required by an application to generate as much energy as is consumed during its production) around 10 times shorter than that of other solar technologies (ASCA®, EPBT 2021).



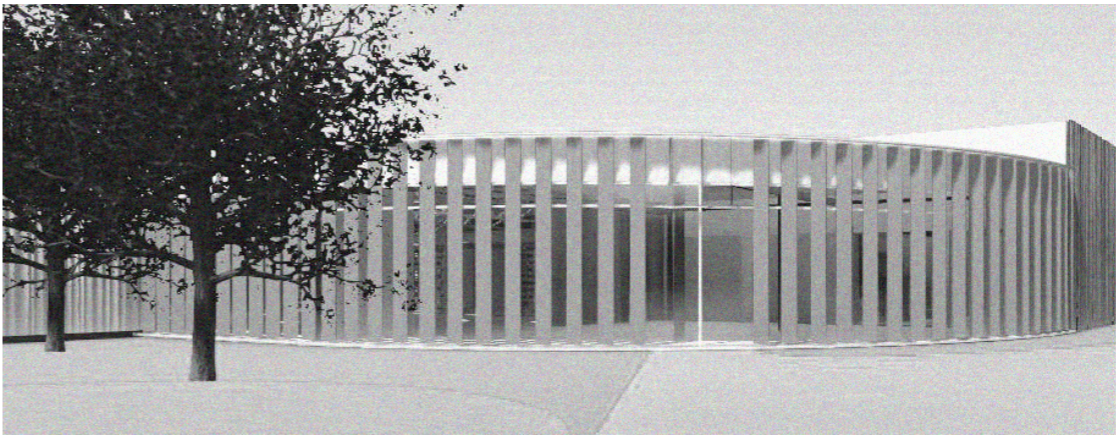
ORGANIC PHOTOVOLTAIC FILM IS SEMI-TRANSPARENT AND CAN BE MADE IN DIFFERENT SHAPES AND COLOURS

SOURCE: ASCA, N.D.

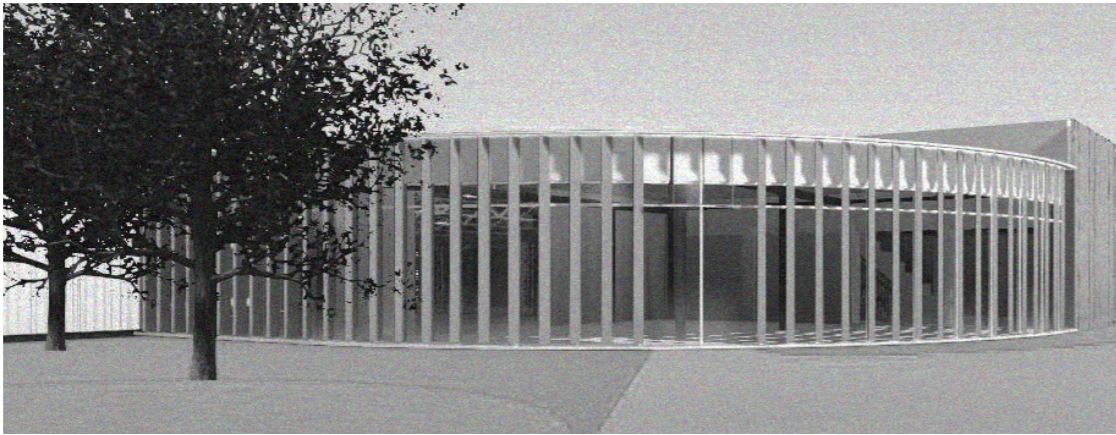
ROTATING TEXTILE LAMELAS



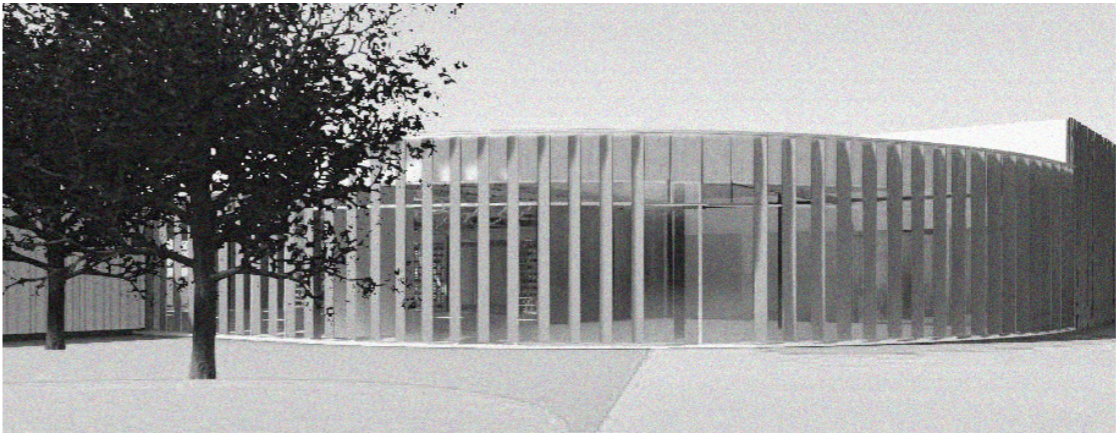
7AM



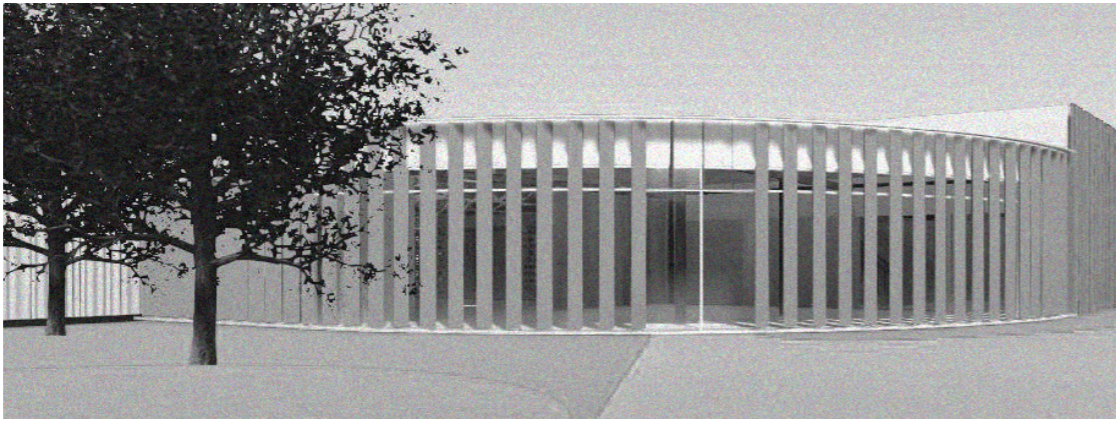
1PM



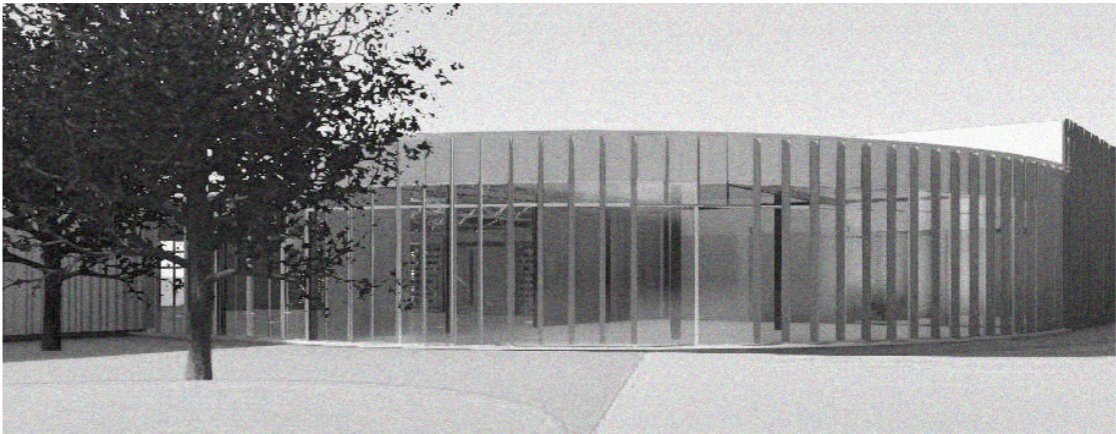
9AM



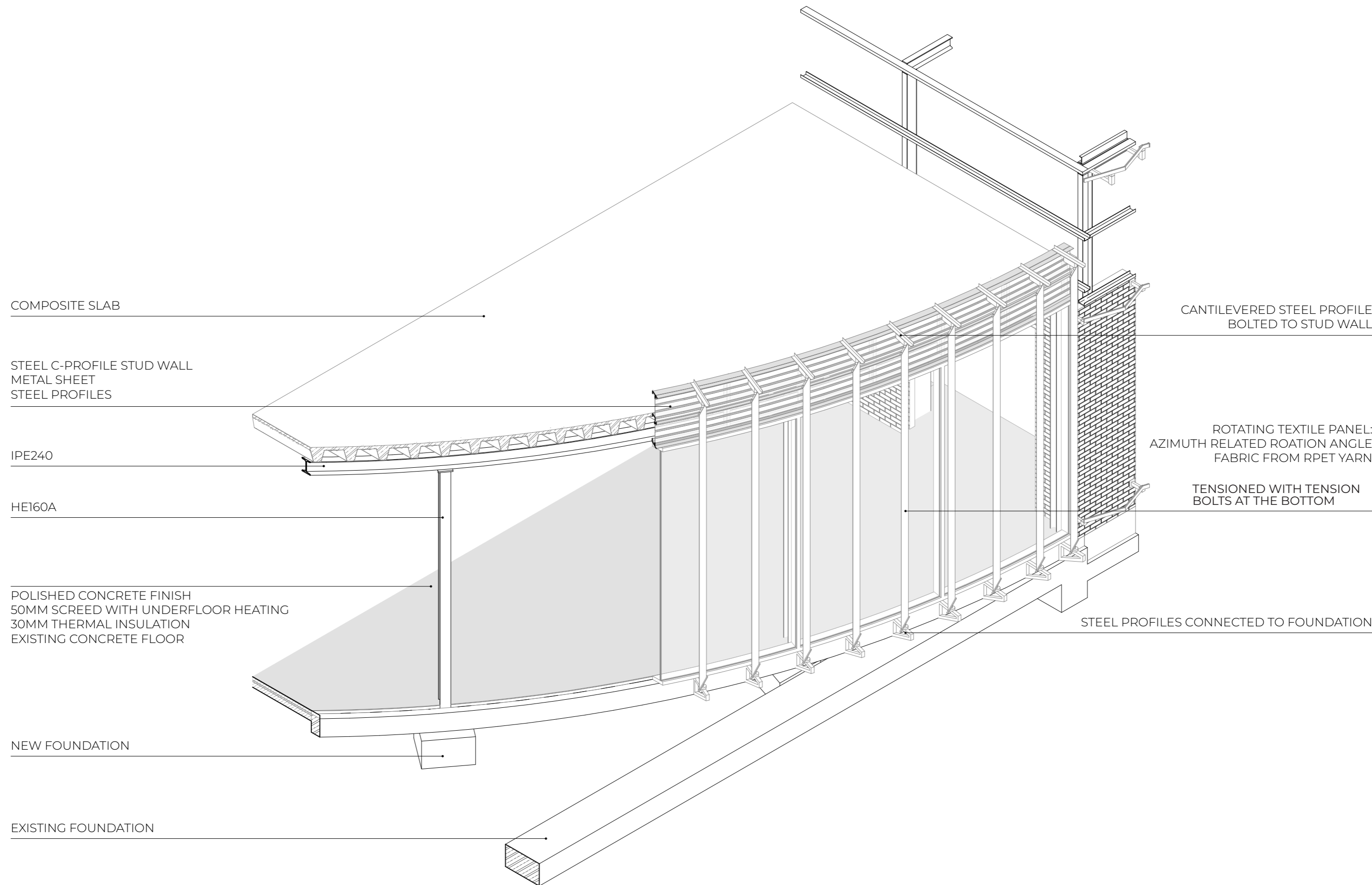
3PM

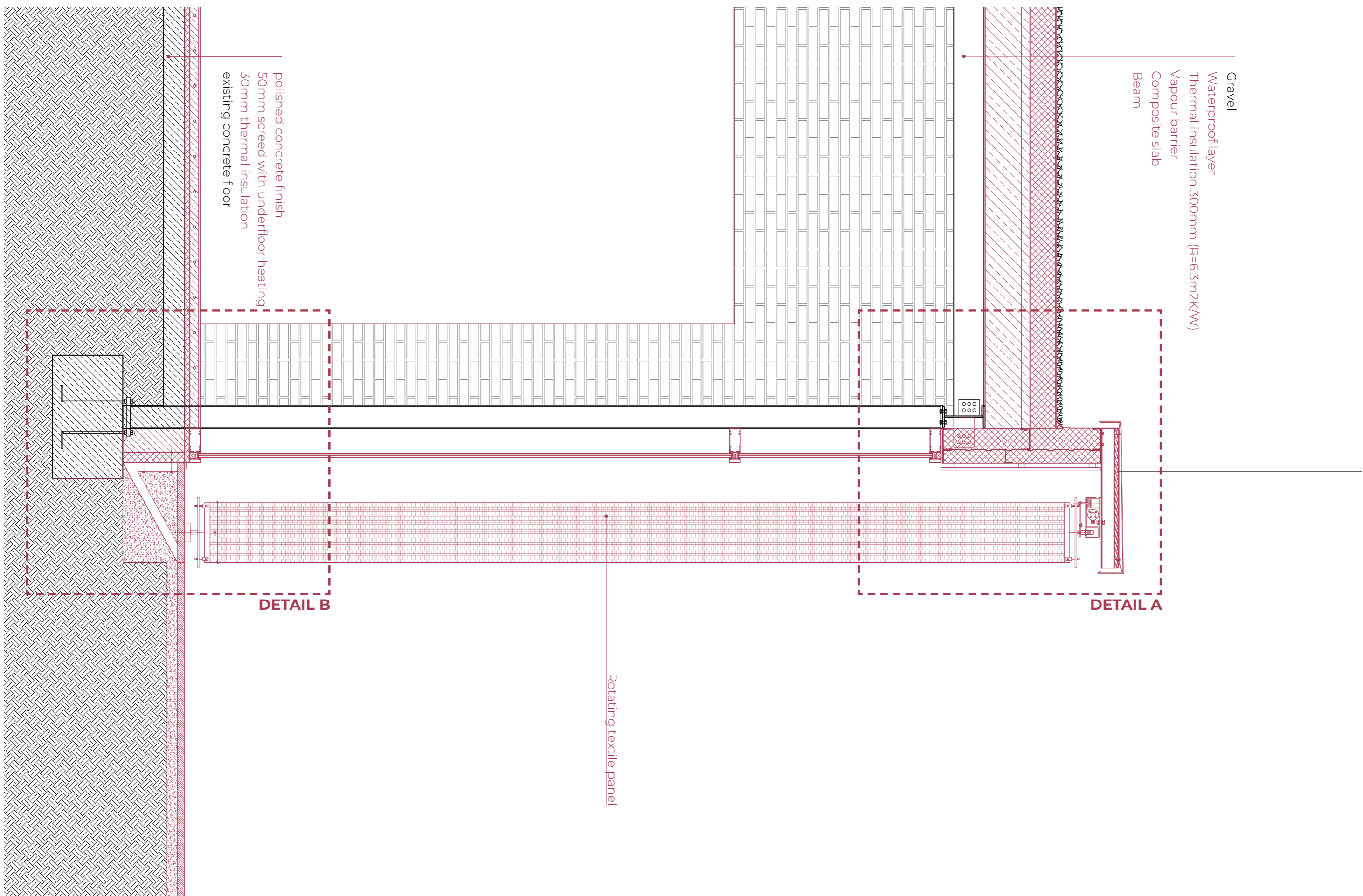


11AM

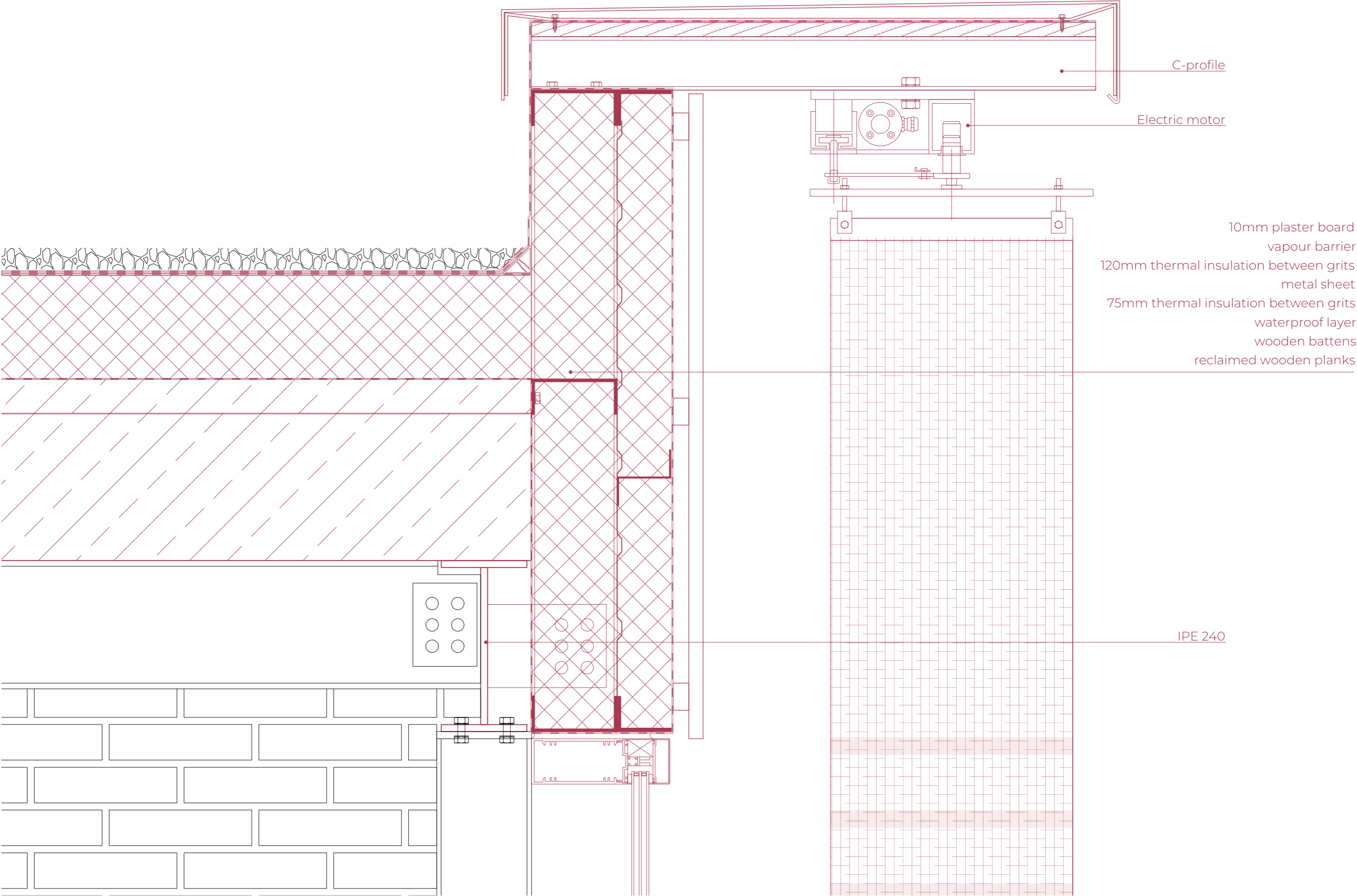


5PM

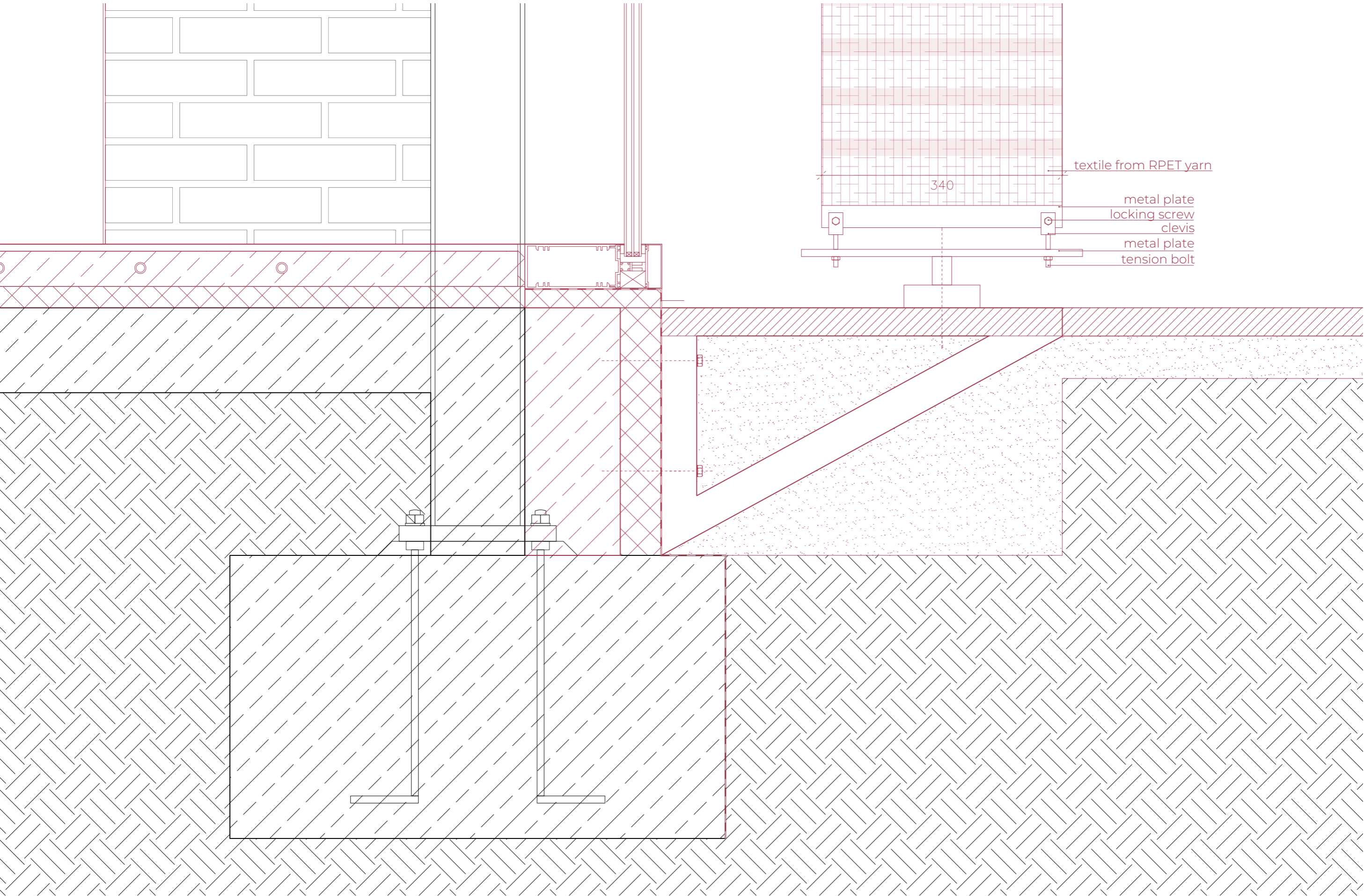


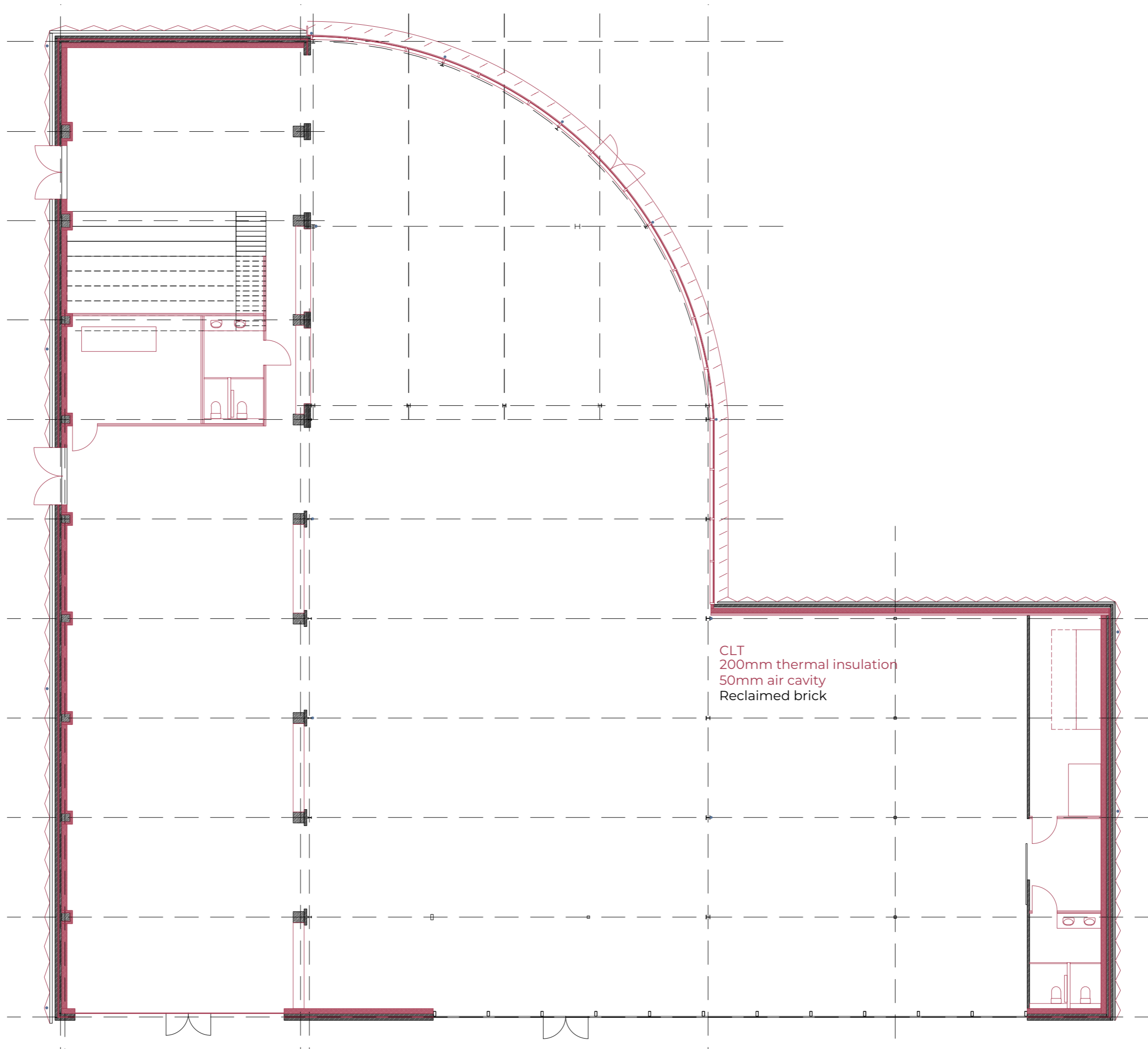


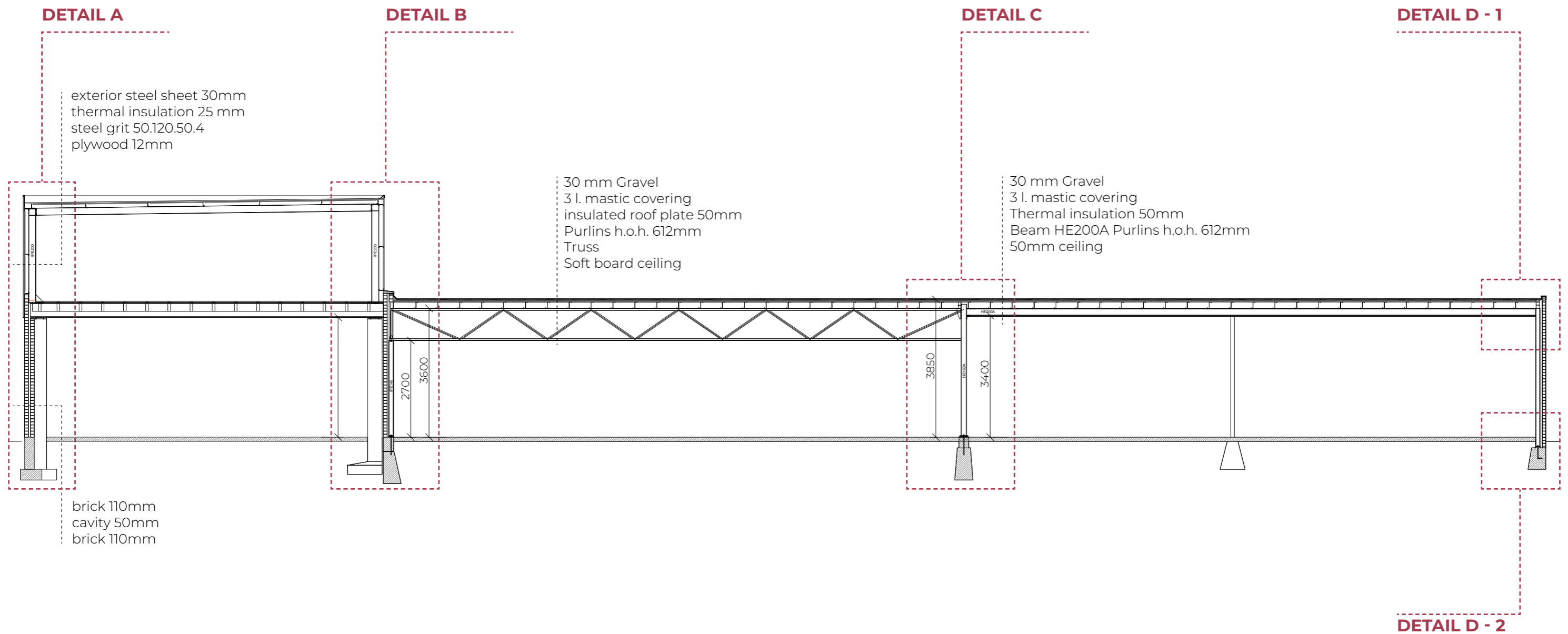
DETAIL A

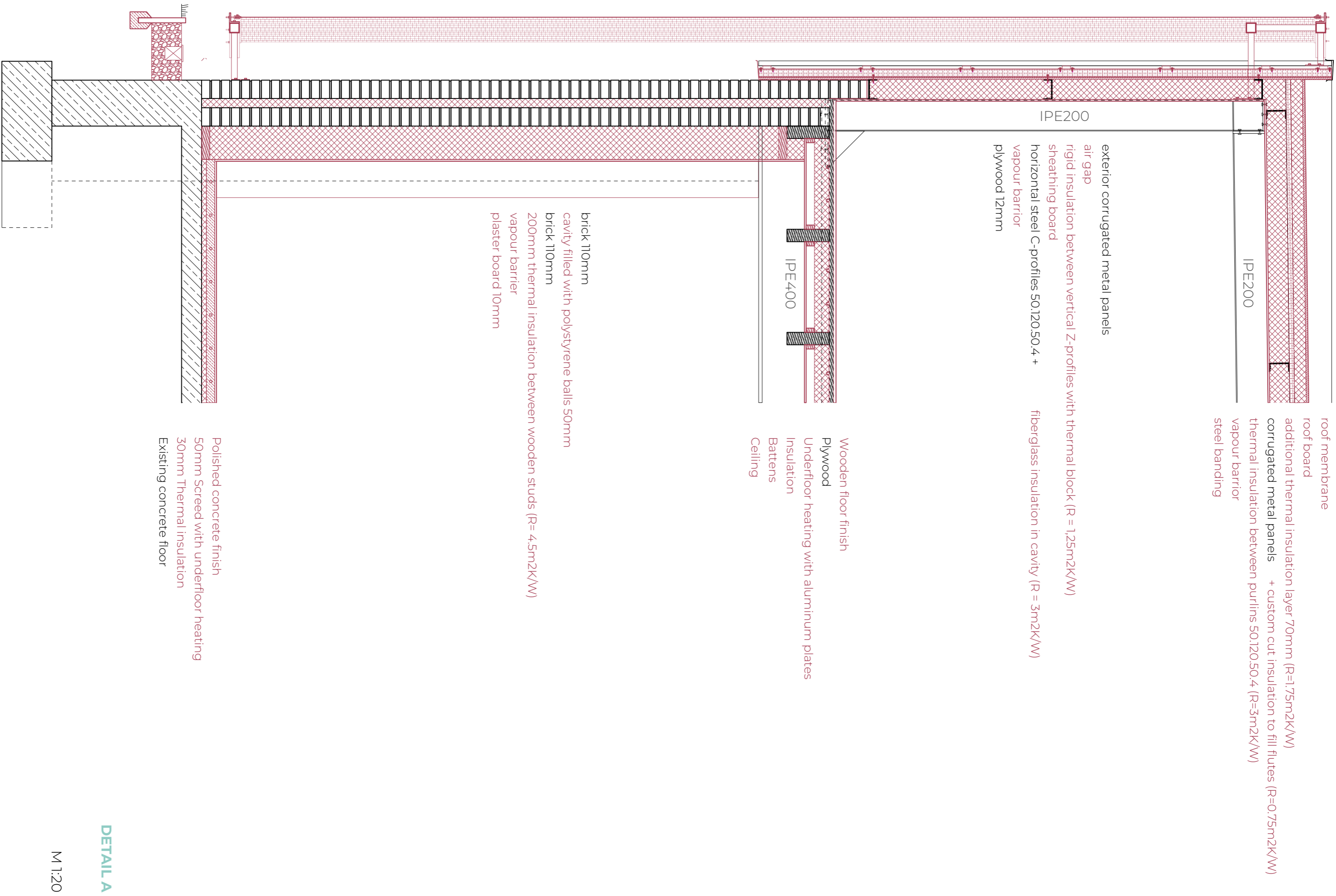


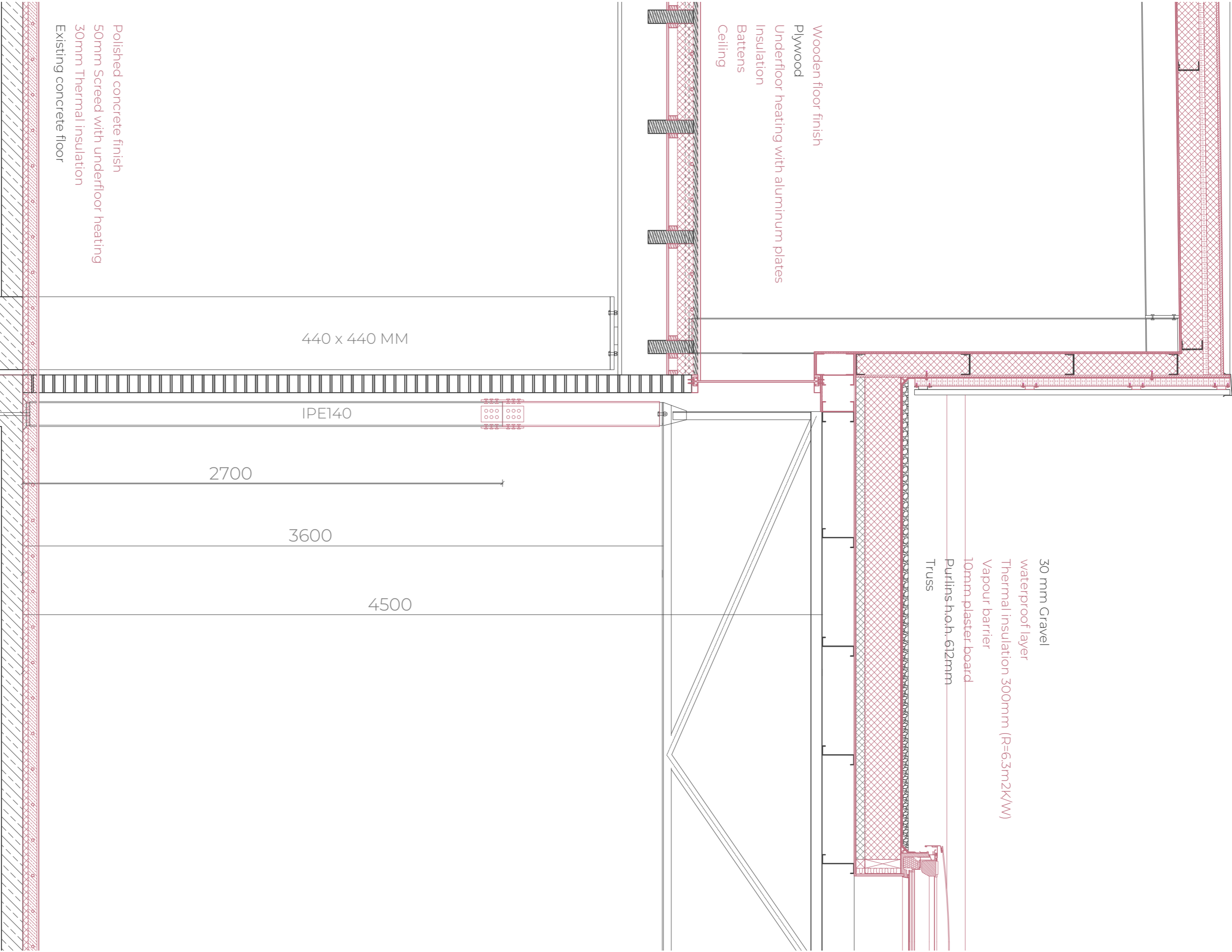
DETAIL B





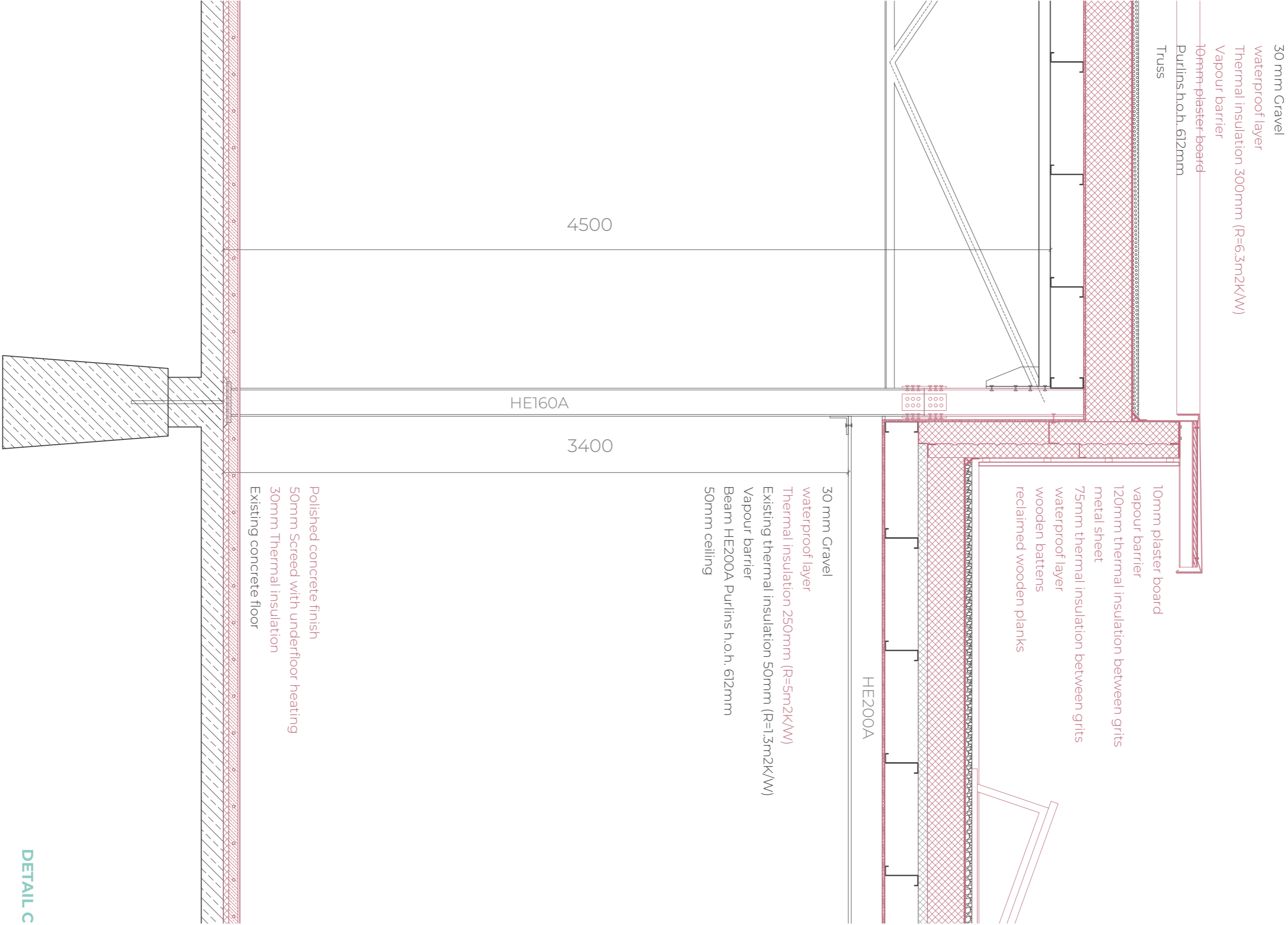






DETAIL B

M 1:20

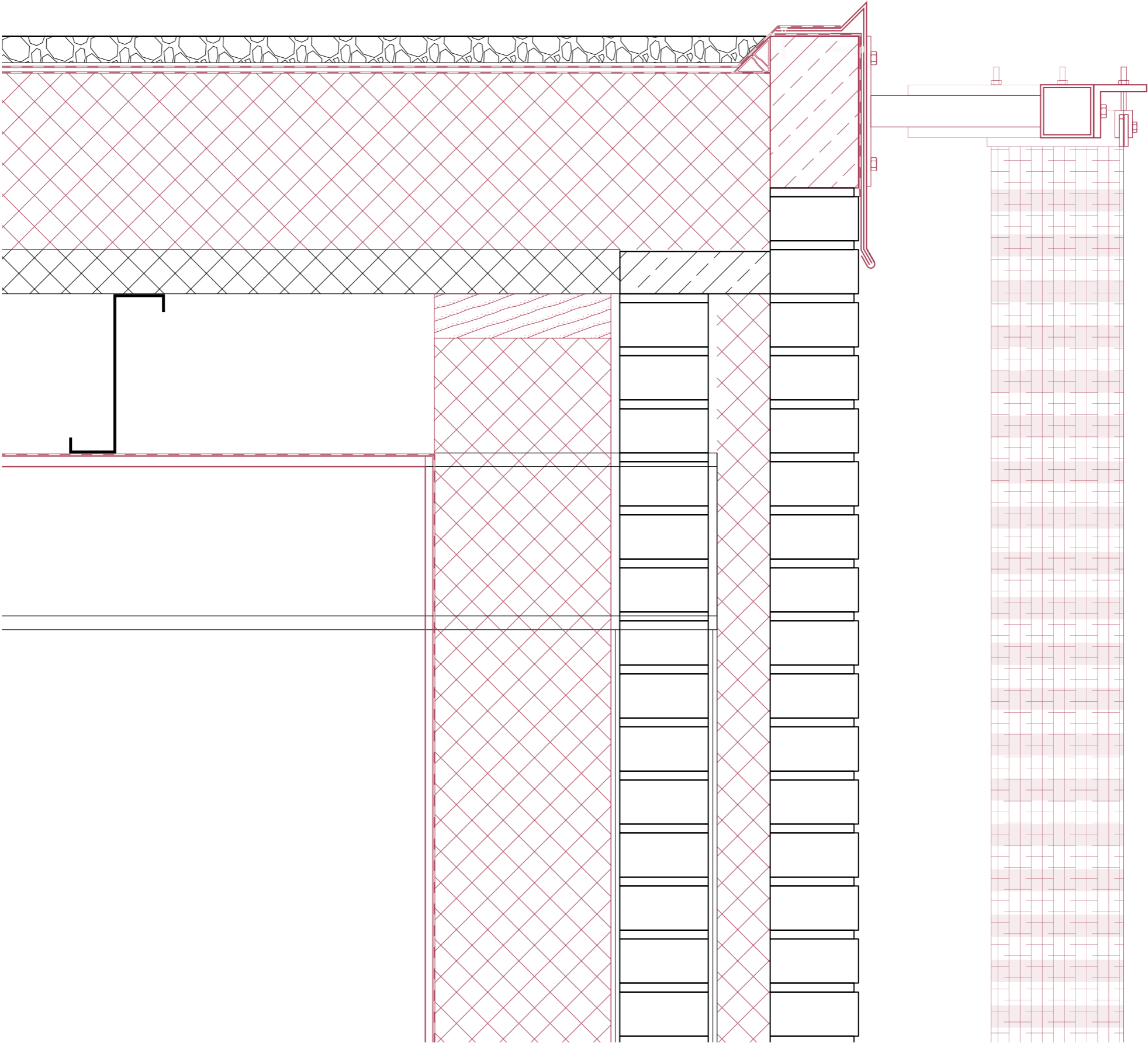


DETAIL C

M 1:20

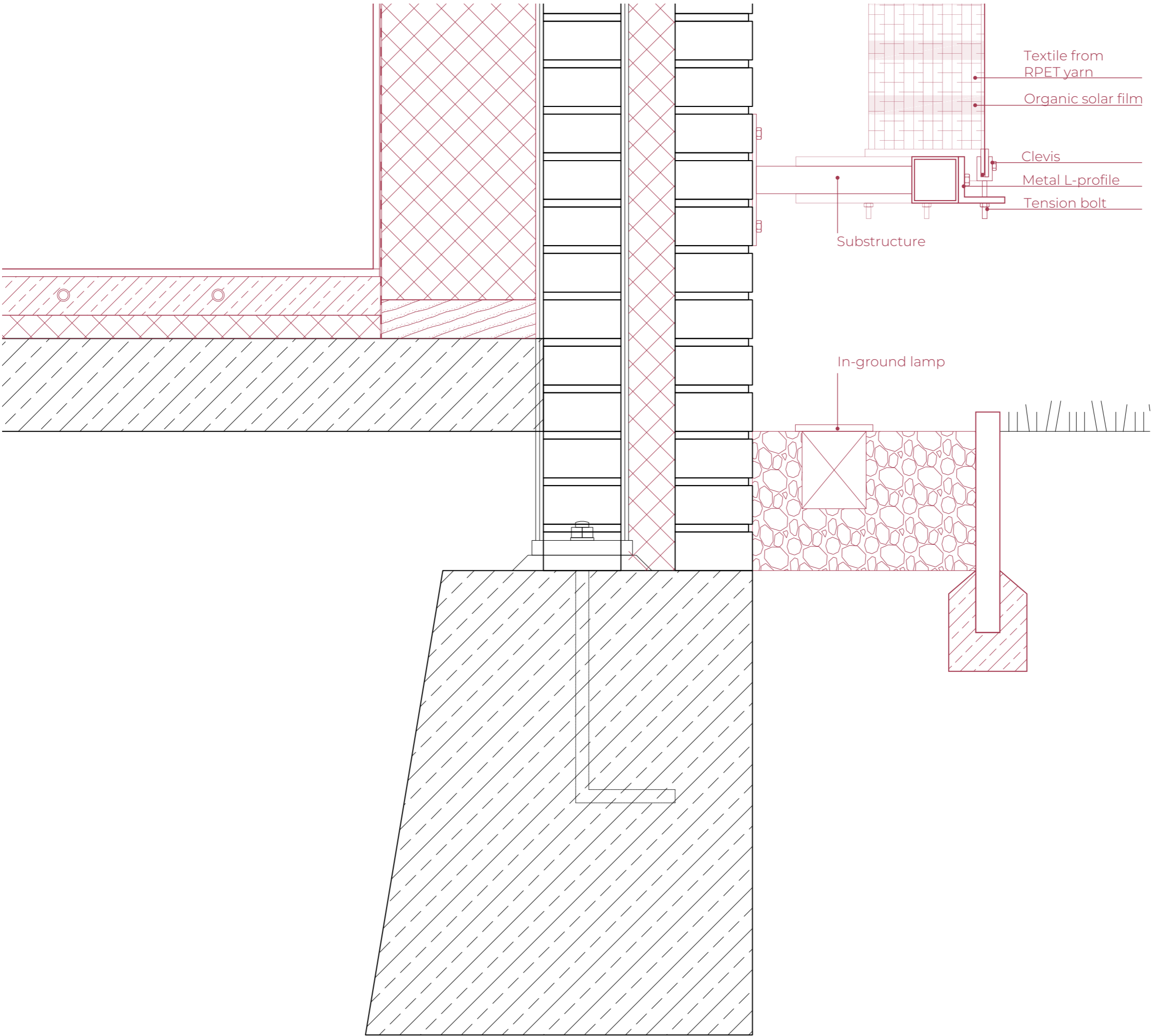
DETAIL D - 1

M 1:5



DETAIL D - 2

M 1:5



## ENERGY LABELS

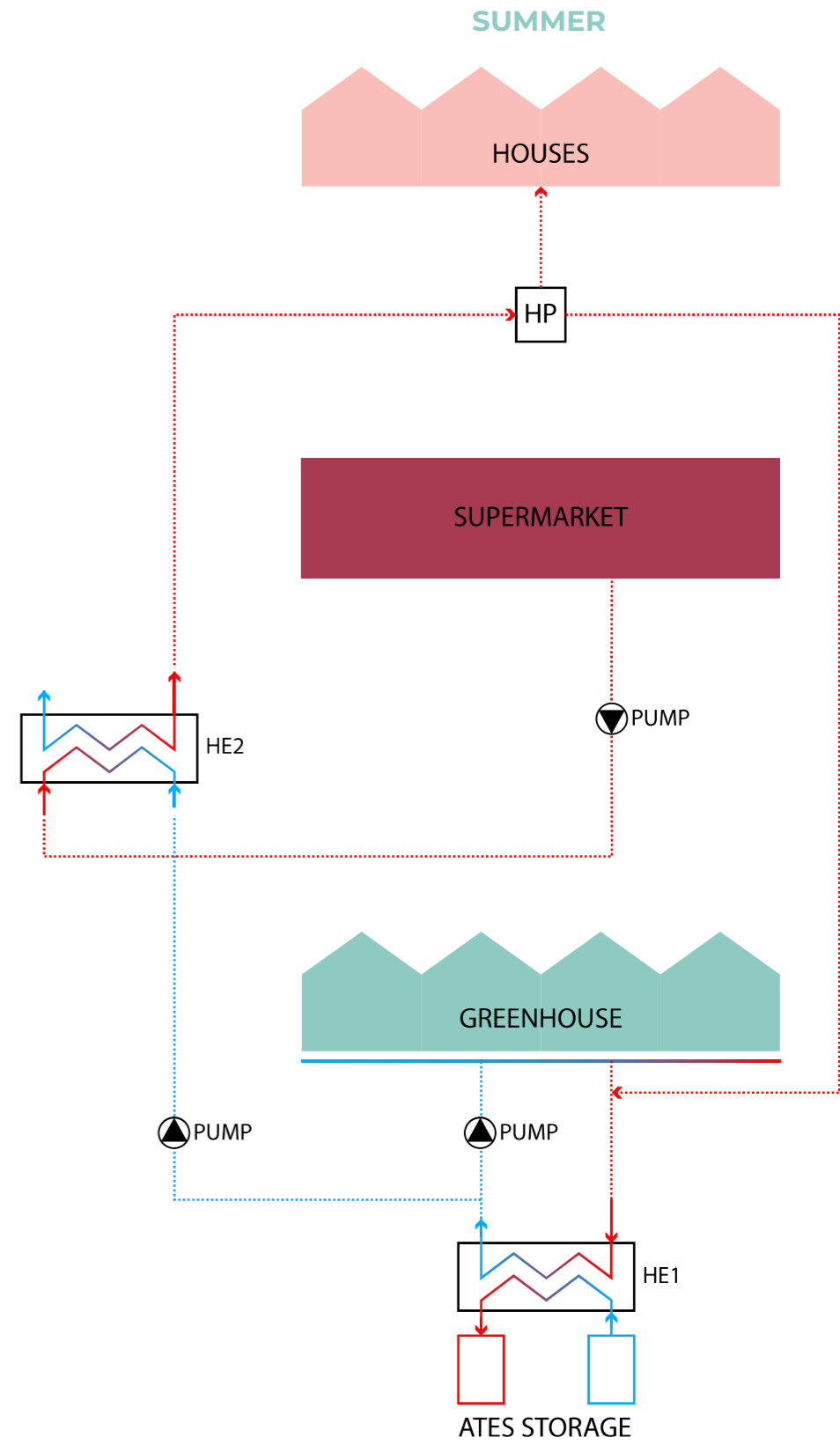
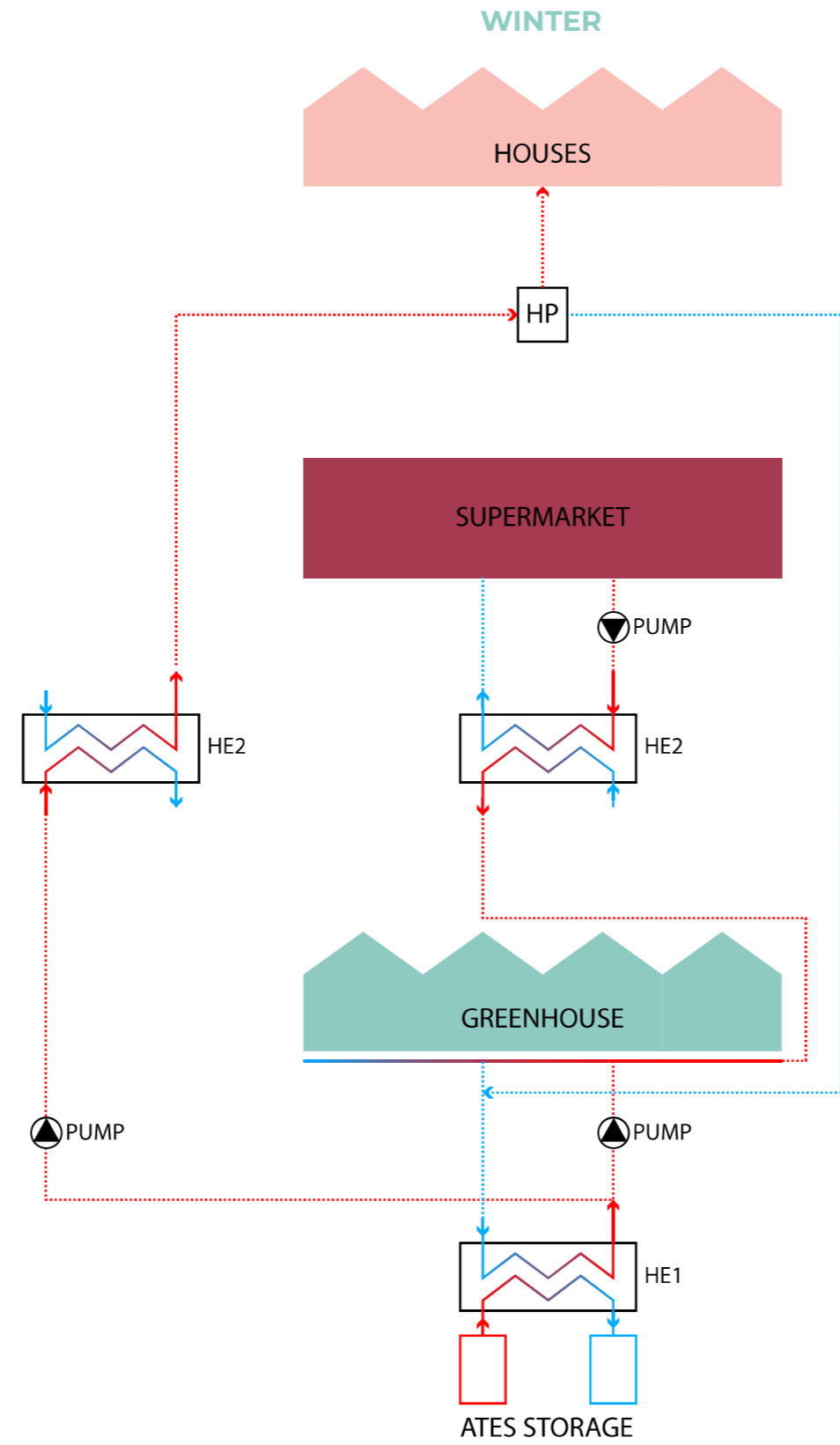


### CLIMATE CONCEPT - CASCADE THINKING

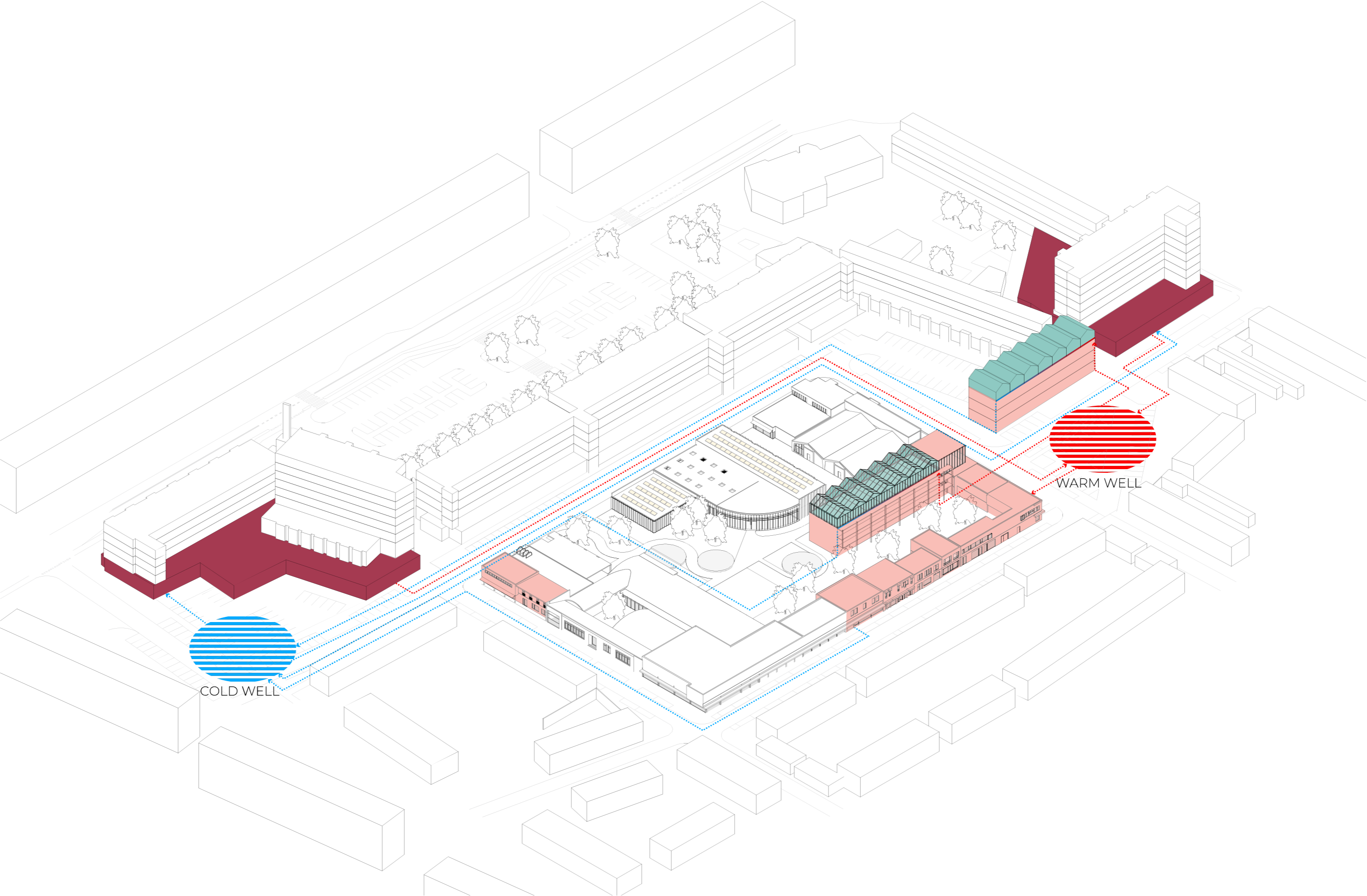
Since supermarkets are mainly just cooled, it generates a certain amount of heat which is then used to heat greenhouse during the winter. When greenhouse reaches accepted indoor temperature, excess heat is then used to increase temperature of water coming from ATEs to heat pumps in residential buildings. If supermarket can not sufficiently heat greenhouse, floor heating connected to ATEs is used. The dropped temperature from greenhouse is then fed back into the cold well of ATEs as well as the outflow from the heat pump.

In summer cold water from ATEs is used to cool greenhouses and heated water is then charged back to ATEs warm well. All excess heat from supermarkets is either used to preheat tap water in houses or goes directly to the warm well.

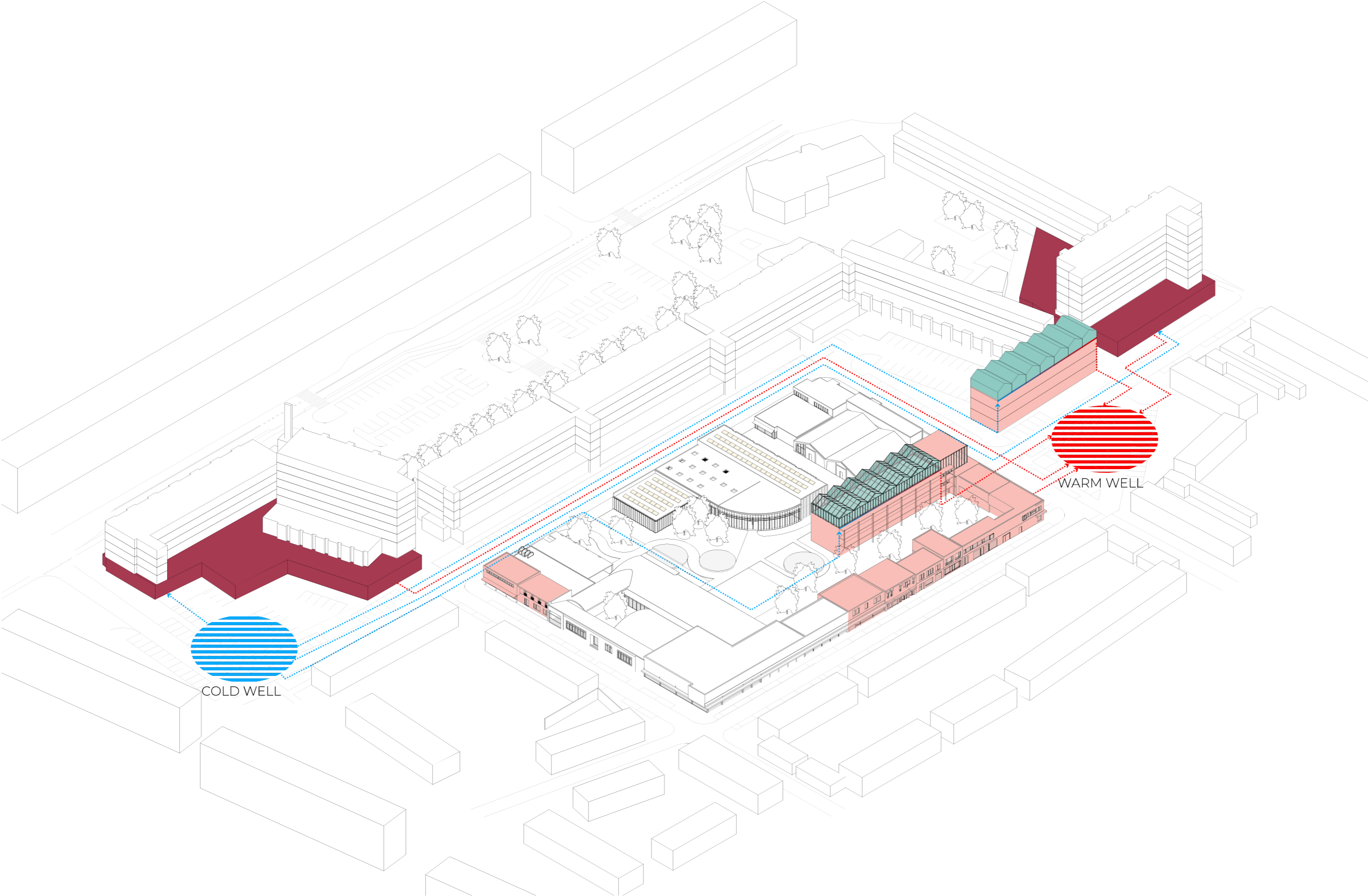
For this system to work efficiently it must be assumed that all of the residential buildings after renovation have reached at least energy label B.



WINTER SITUATION



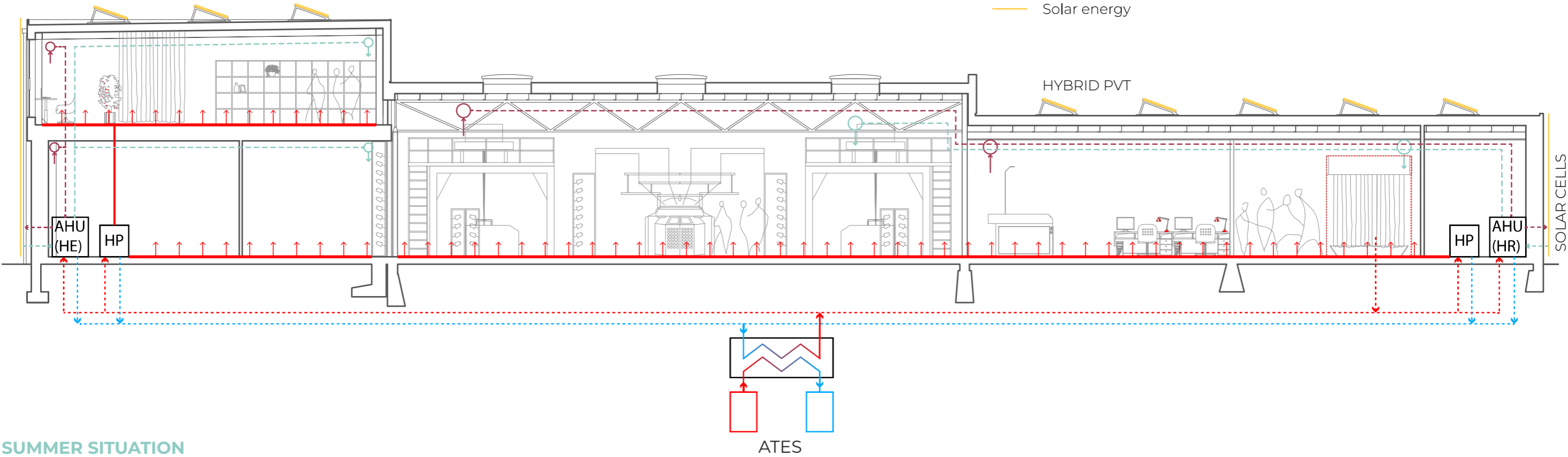
SUMMER SITUATION



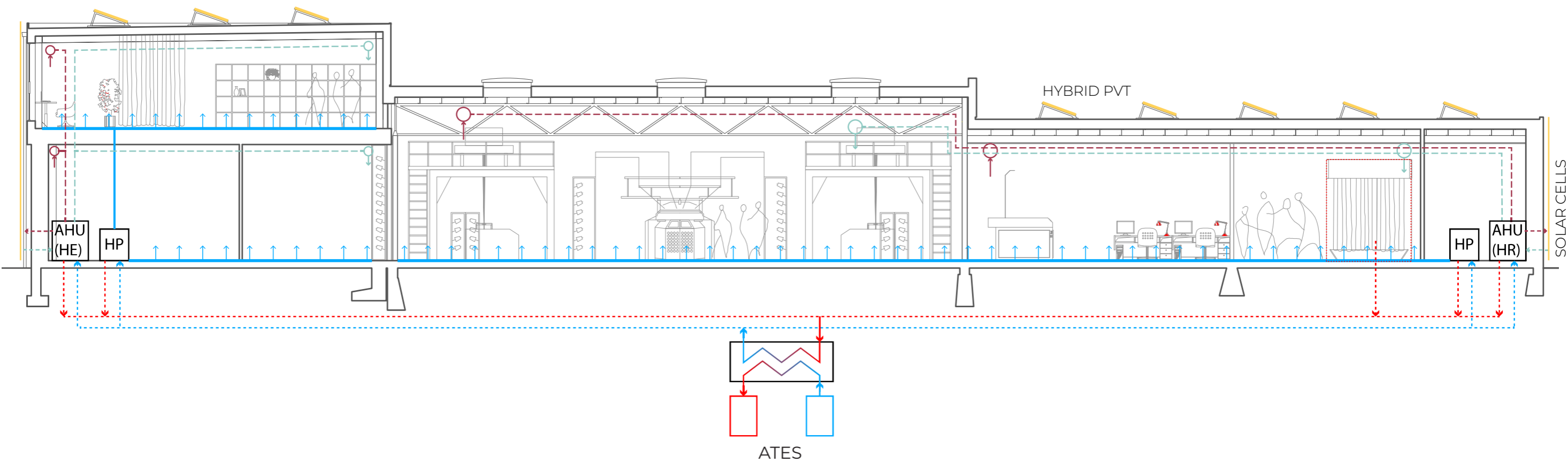
HEATING / COOLING / VENTILATION

- Heat (liquid)
- Cool (liquid)
- Fresh air
- Exhaust air
- Solar energy
- AHU (HE) Air handling unit with heat exchanger
- AHU (HR) Air handling unit with heat recovery
- HP Heat pump
- Heat exchanger

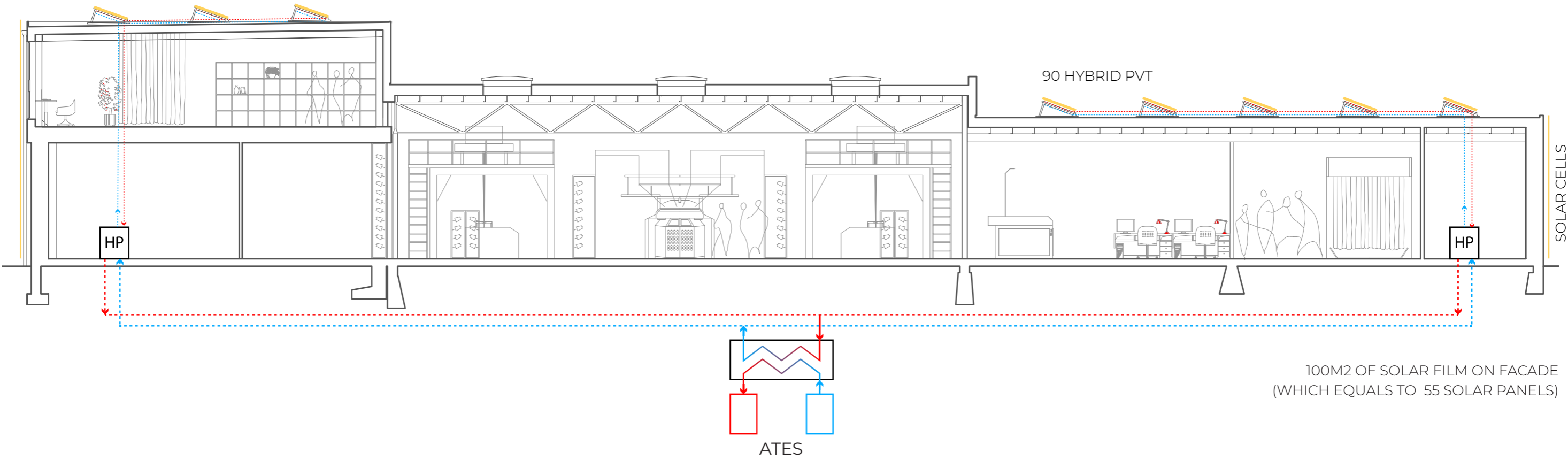
WINTER SITUATION



SUMMER SITUATION



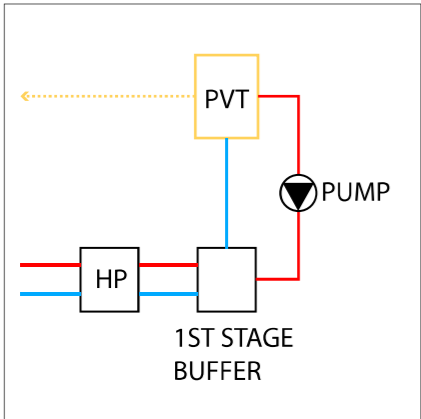
SOLAR ENERGY



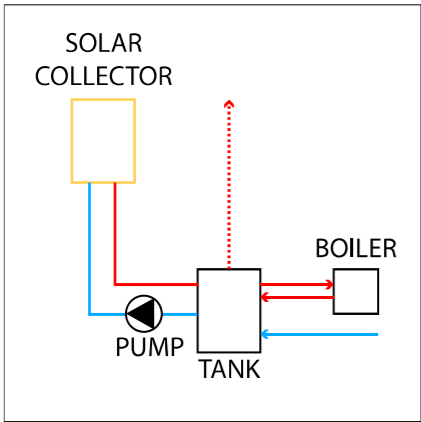
SOLAR ENERGY

- PVT panels (hybrid) = 2 300 m2
- PV panels + solar thermal = 1050 m2
- Solar cells (weaved) = 270 m2

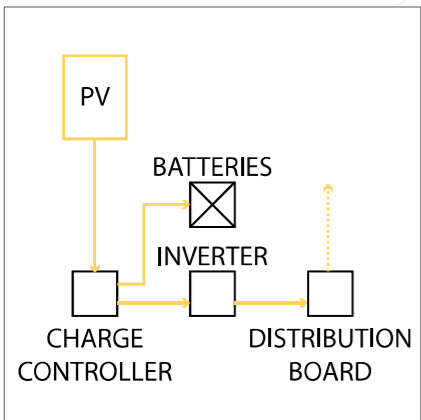
2300 h of sun in Tilburg



PVT (HYBRID) = 175 W/M2

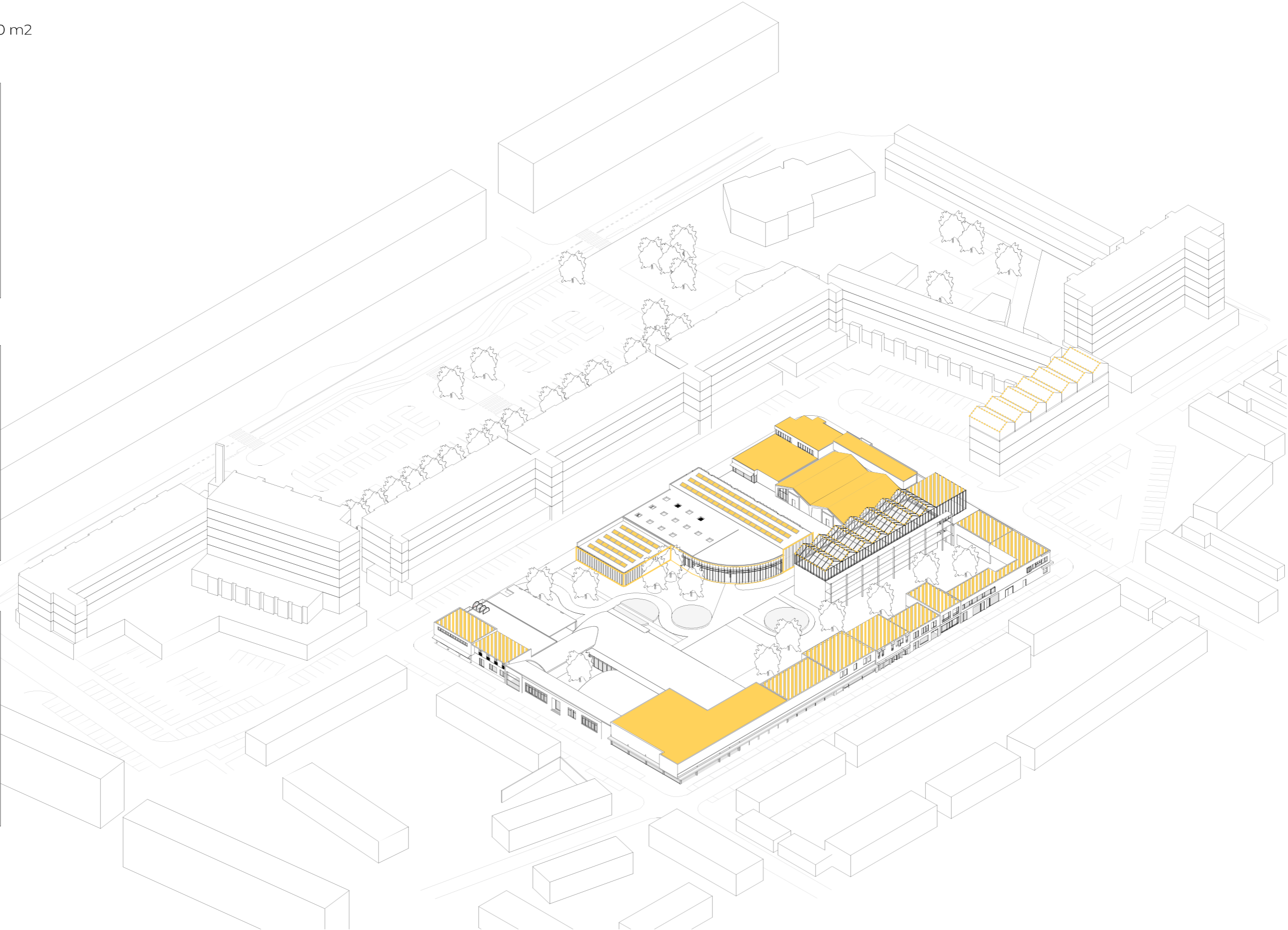


SOLAR THERMAL



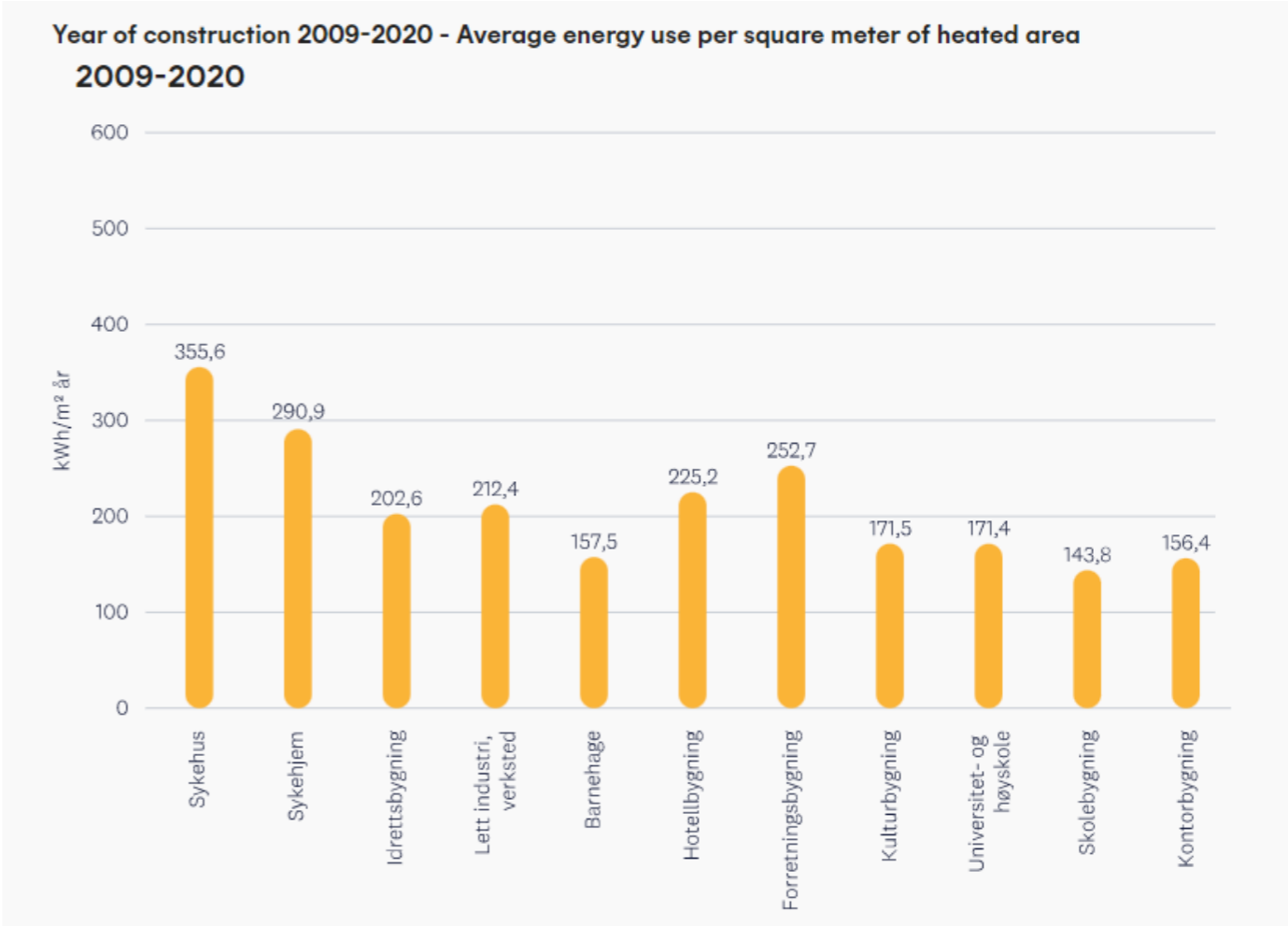
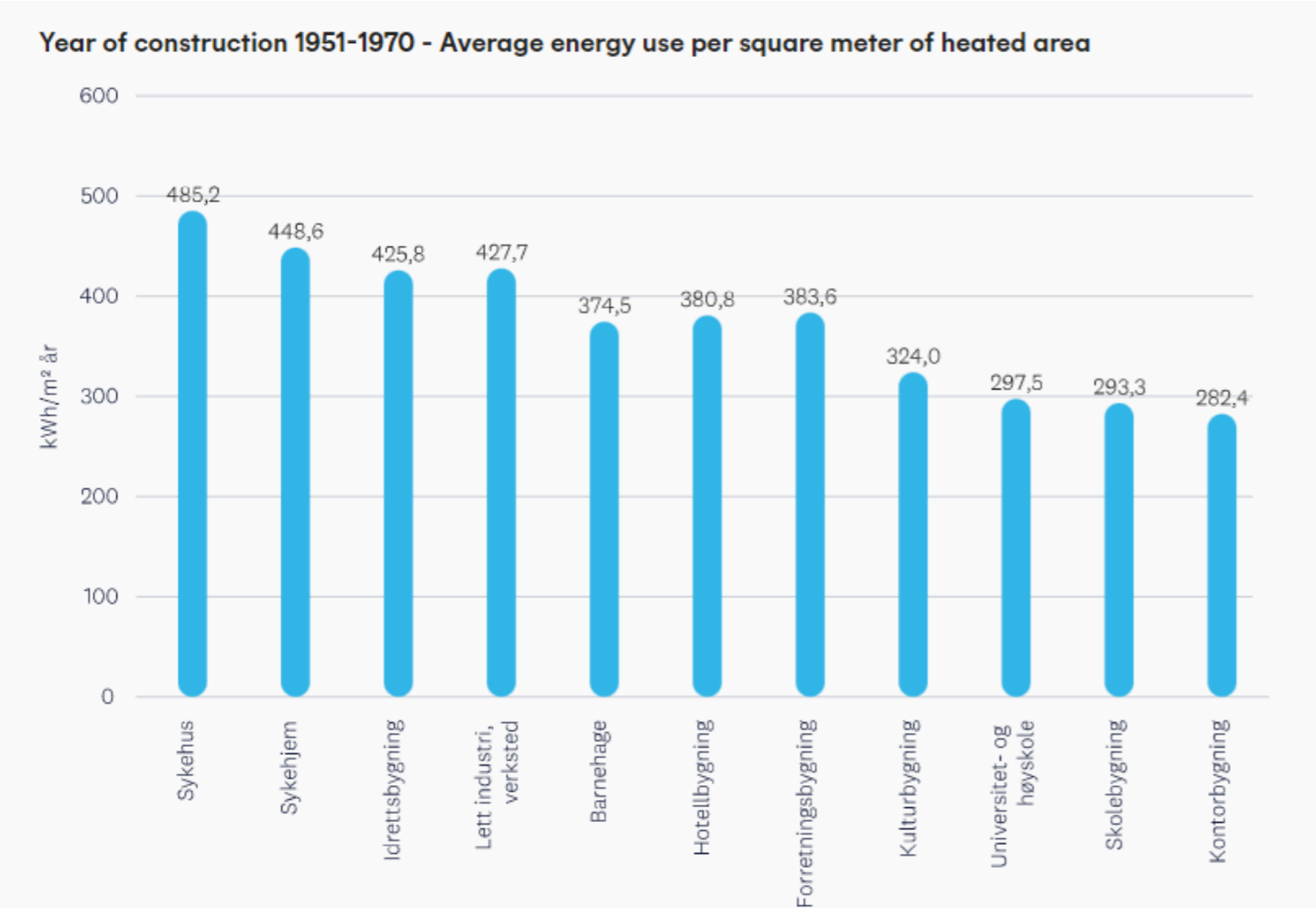
PV PANELS = 200 W/M2

SOLAR TEXTILE = 70 W/M2



ENERGY CONSUMPTION

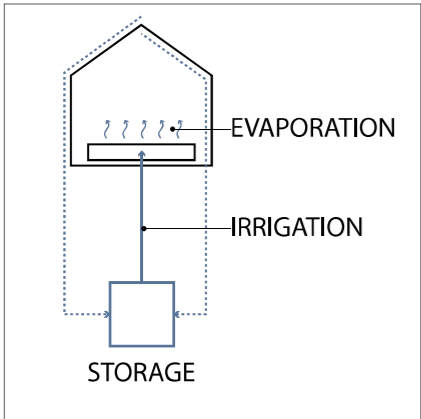
| Housing characteristics | Periods | Regions         | Average consumption of natural gas<br>(m3) | Average consumption of electricity<br>(kWh) | District heating<br>(%) |
|-------------------------|---------|-----------------|--|---|-------------------------|
| Total dwellings         | 2018*   | The Netherlands | 1,270                                      | 2,790                                       | .                       |
|                         | 2019*   |                 | 1,180                                      | 2,730                                       | 5.9                     |
|                         | 2020*   |                 | 1,120                                      | 2,760                                       | 6.3                     |
|                         | 2021*   |                 | 1,280                                      | 2,810                                       | 6.4                     |



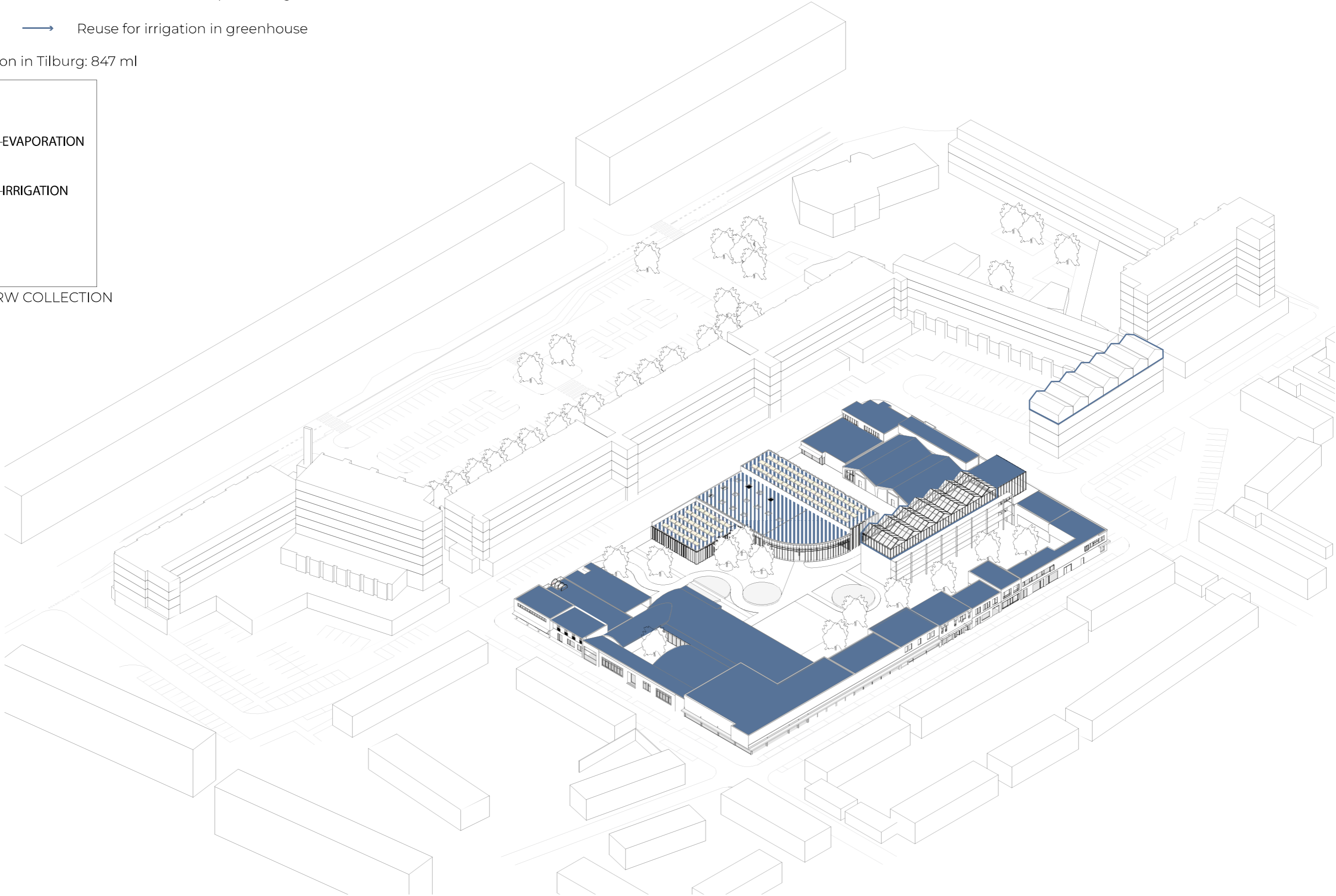
RAINWATER HARVESTING

- 2 724 670 L → Reuse for washing machines, toilets, irrigation, etc.
- 927 808 L → Reuse for textile wet processing
- 354 795 L → Reuse for irrigation in greenhouse

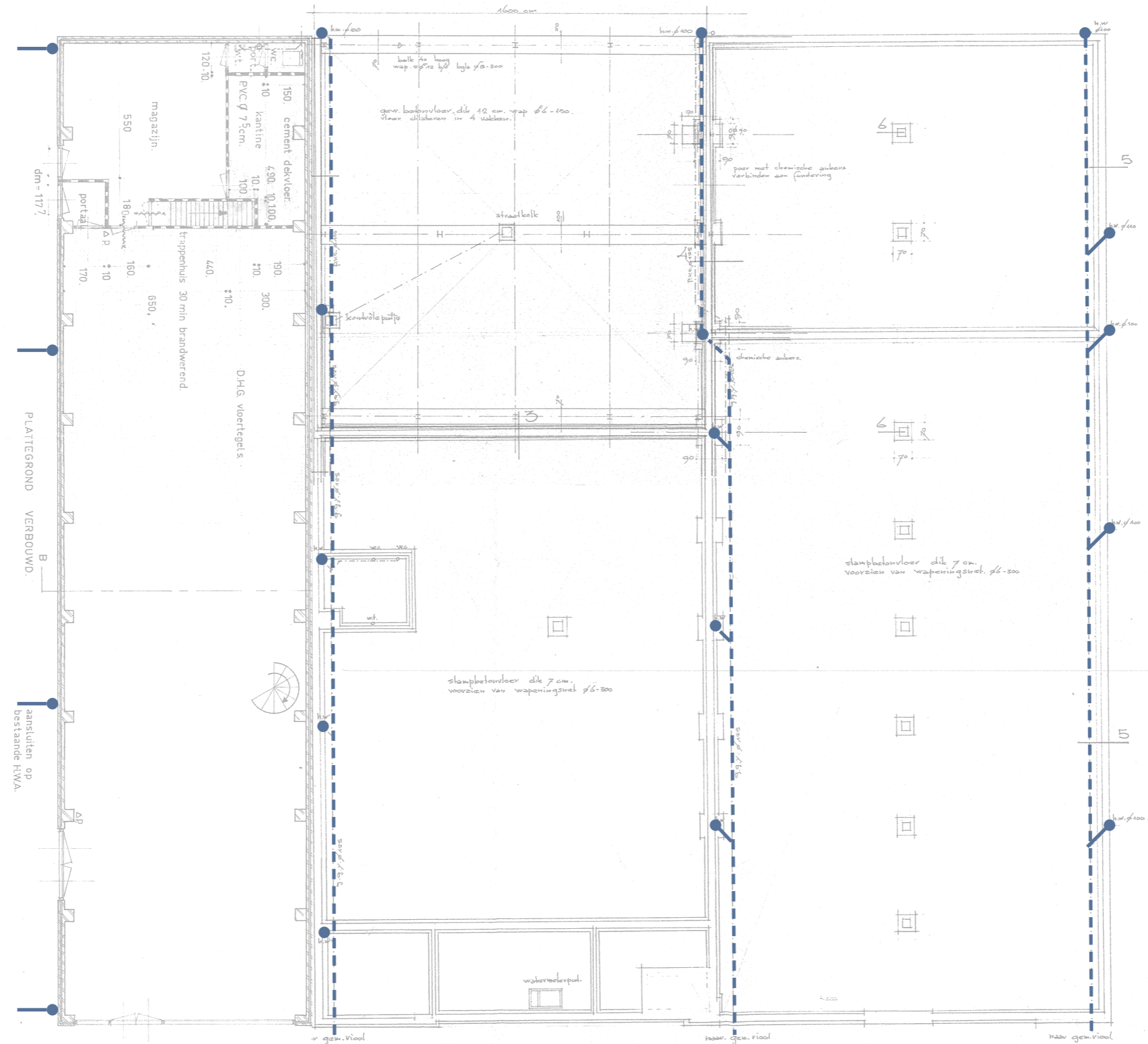
Annual perception in Tilburg: 847 ml



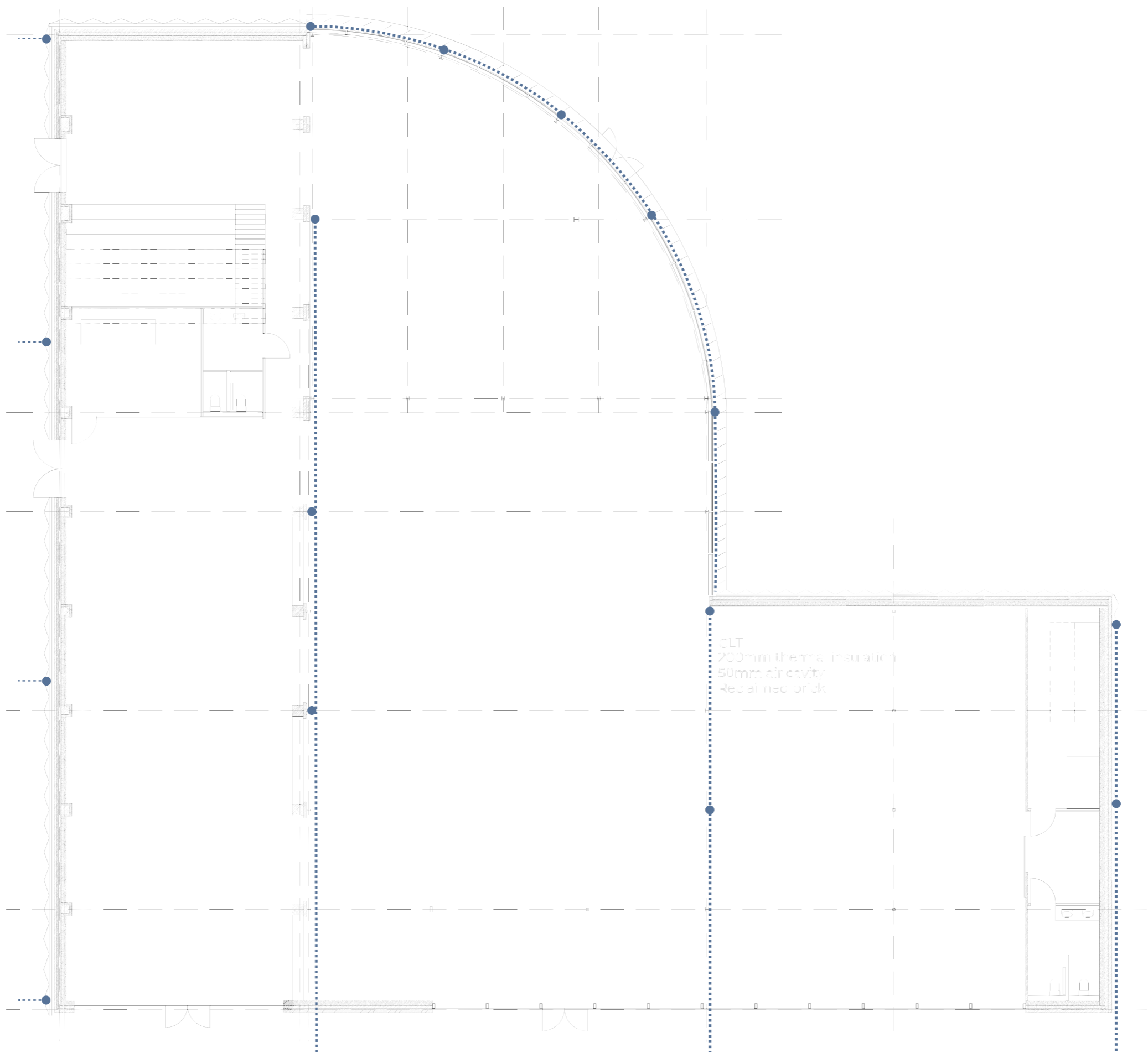
GREENHOUSE RW COLLECTION



## RAINWATER SYSTEM - EXISTING



RAINWATER SYSTEM - NEW



BIBLIOGRAPHY

ASCA®, Efficiency Increase (2021). Asca increases performance of Organic Solar cells by integrating new semiconductors Retrieved from <https://en.asca.com/latest-news/asca-increases-performance-of-organic-solar-cells-by-integrating-new-semiconductors>

ASCA®, EPBT (2021). Focus on the Energy Payback Time of the Asca Film. Retrieved from <https://en.asca.com/latest-news/focus-on/focus-of-the-energy-payback-time-of-the-asca-film>

Drew, P. (2008). New tent architecture. Thames & Hudson: New York.

Morssinkhof Sustainable Products. (n.d) Industrial Yarns. Retrieved from: <https://www.msp-emmen.com/industrial-yarns>

Printable. (n.d.) Sustainable facade: The balance of aesthetics, function and sustainability. Retrieved from: <https://printable.eu/blog/2020/02/28/sustainable-facade/>

Van Dongen, P., Britton, E., Wetzel, A., Houtman, R., Ahmed, A. M., & Ramos, S. (2022). Suntex. In Journal of Facade Design and Engineering (Vol. 10, Issue 2, pp. 141–160). Stichting OpenAccess Foundation. <https://doi.org/10.47982/jfde.2022.powerskin.9>

Plan’t Zand, het nieuwe Tilburg. (1958, March 1). Nieuwe Tilburgsche courant. Retrieved from: [https://www.delpher.nl/nl/kranten/view?coll=ddd&query=%28winkelcentrum+westermarkt%29&cql%5B%5D=%28date+\\_lte\\_+%2230-09-1958%22%29&redirect=true&identifier=MMKB19:000264051:mpeg21:a00079&resultsidentifier=MMKB19:000264051:mpeg21:a00079&rowid=2](https://www.delpher.nl/nl/kranten/view?coll=ddd&query=%28winkelcentrum+westermarkt%29&cql%5B%5D=%28date+_lte_+%2230-09-1958%22%29&redirect=true&identifier=MMKB19:000264051:mpeg21:a00079&resultsidentifier=MMKB19:000264051:mpeg21:a00079&rowid=2)

Wijziging centrum 't Zand. (1958, September 20). Nieuwe Tilburgsche courant. Retrieved from: [https://www.delpher.nl/nl/kranten/view?coll=ddd&query=%28winkelcentrum+westermarkt%29&cql%5B%5D=%28date+\\_gte\\_+%2201-09-1958%22%29&cql%5B%5D=%28date+\\_lte\\_+%2230-09-1958%22%29&redirect=true&identifier=MMKB19:000275070:mpeg21:a00106&resultsidentifier=MMKB19:000275070:mpeg21:a00106&rowid=1](https://www.delpher.nl/nl/kranten/view?coll=ddd&query=%28winkelcentrum+westermarkt%29&cql%5B%5D=%28date+_gte_+%2201-09-1958%22%29&cql%5B%5D=%28date+_lte_+%2230-09-1958%22%29&redirect=true&identifier=MMKB19:000275070:mpeg21:a00106&resultsidentifier=MMKB19:000275070:mpeg21:a00106&rowid=1)

Hoogste punt bereikt van gebouw Nillmij: Warenhuis “Vedette” in najaar van start. (1963, April 27). Nieuwe Tilburgsche courant. Retrieved from: [https://www.delpher.nl/nl/kranten/view?coll=ddd&query=%28winkelcentrum+westermarkt%29&cql%5B%5D=%28date+\\_gte\\_+%2201-01-1963%22%29&cql%5B%5D=%28date+\\_lte\\_+%2201-01-1964%22%29&facets%5Btype%5D%5B%5D=artikel&redirect=true&identifier=MMKB19:002061023:mpeg21:a00207&resultsidentifier=MMKB19:002061023:mpeg21:a00207&rowid=2](https://www.delpher.nl/nl/kranten/view?coll=ddd&query=%28winkelcentrum+westermarkt%29&cql%5B%5D=%28date+_gte_+%2201-01-1963%22%29&cql%5B%5D=%28date+_lte_+%2201-01-1964%22%29&facets%5Btype%5D%5B%5D=artikel&redirect=true&identifier=MMKB19:002061023:mpeg21:a00207&resultsidentifier=MMKB19:002061023:mpeg21:a00207&rowid=2)

Ondanksmodderigewegen:DrukteopWestermarkt. (1961, December14). NieuweTilburgsche courant. Retrieved from: [https://www.delpher.nl/nl/kranten/view?coll=ddd&query=%28winkelcentrum+westermarkt%29&cql%5B%5D=%28date+\\_gte\\_+%2201-01-1961%22%29&cql%5B%5D=%28date+\\_lte\\_+%2201-01-1962%22%29&redirect=true&page=1&maxperpage=20&facets%5Btype%5D%5B%5D=artikel&identifier=MMKB19:000276063:mpeg21:a00014&resultsidentifier=MMKB19:000276063:mpeg21:a00014&rowid=5](https://www.delpher.nl/nl/kranten/view?coll=ddd&query=%28winkelcentrum+westermarkt%29&cql%5B%5D=%28date+_gte_+%2201-01-1961%22%29&cql%5B%5D=%28date+_lte_+%2201-01-1962%22%29&redirect=true&page=1&maxperpage=20&facets%5Btype%5D%5B%5D=artikel&identifier=MMKB19:000276063:mpeg21:a00014&resultsidentifier=MMKB19:000276063:mpeg21:a00014&rowid=5)

Jongerius, S. (2015, November 15). Vernieuwing Westermarkt Tilburg definitief mislukt. AD. Retrieved from: <https://www.ad.nl/tilburg/vernieuwing-westermarkt-tilburg-definitief-mislukt~a2d000fb/>

Jongerius, S. (2019, February 12). Ondernemers Westermarkt slaan handen ineen. BD. Retrieved from: <https://www.bd.nl/tilburg-e-o/ondernemers-westermarkt-slaan-handen-ineen~a430edb6/>

Gemeente Tilburg. (2021). Gebiedsvisie Kenniskwartier. Retrieved from: <https://www.tilburg.nl/gemeente/gebiedsontwikkeling/kenniskwartier/>

Wurck. (2009) Westermarkt. Retrieved from: <https://www.wurck.nl/projecten/westermarkt-tilburg/>

Doevendans, C. H., Luiten, J. H., Rutgers, R., & Van Wylick Architecten, D. (1996). Stadsvorm Tilburg, stadsontwerp en beeldkwaliteit: de vorm van de stad als object van onderzoek en ontwerp.

Thoring, K., Mueller, R. M., Desmet, P., & Badke-Schaub, P. (2018). DESIGN PRINCIPLES FOR CREATIVE SPACES. In Proceedings of the DESIGN 2018 15th International Design Conference. 15th International Design Conference. Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Croatia; The Design Society, Glasgow, UK. <https://doi.org/10.21278/idc.2018.0233>