



# KABELFABRIEK 2.0

P i e n   C a t h e l i j n e   S o p h i e   T o l

Design booklet  
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Heritage & Architecture  
MSc 3 & 4 Heritage4all  
30-06-2021

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# KABELFABRIEK 2.0

Working and living cabled in the factory





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## VALUES ASSESSMENTS

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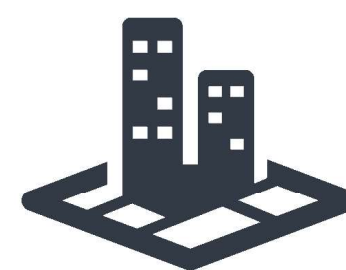


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Reflection paper

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# VALUES ASSESSMENTS

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This chapter reiterates the values and attributes assessment done during the first half of the graduation year. A more elaborate version of the values and attributes assessment with the stakeholders can be read in the research booklet, Kabelfabriek 2.0, on page 53. In this chapter the vision of the graduate student, Pien Cathelijne Sophie Tol, on the values and attributes of the factory can be read. A comparison is made between the outcome of the stakeholders involvement and the vision of the graduate student. Furthermore, the valued skin and construction of the factory are addressed in more detail. Concluding this chapter shows the reconciliation of the values assessments.



## STAKEHOLDERS INVOLVEMENT

### “Explore the game” + “Values & Attributes” survey

The result of this phase in the workshop is a values and attributes assessment. The participants were asked to fill out a survey on values and attributes. Three options were given:

- o not valuable - it may be removed
- o average valuable - it may be adapted
- o valuable - it should be preserved

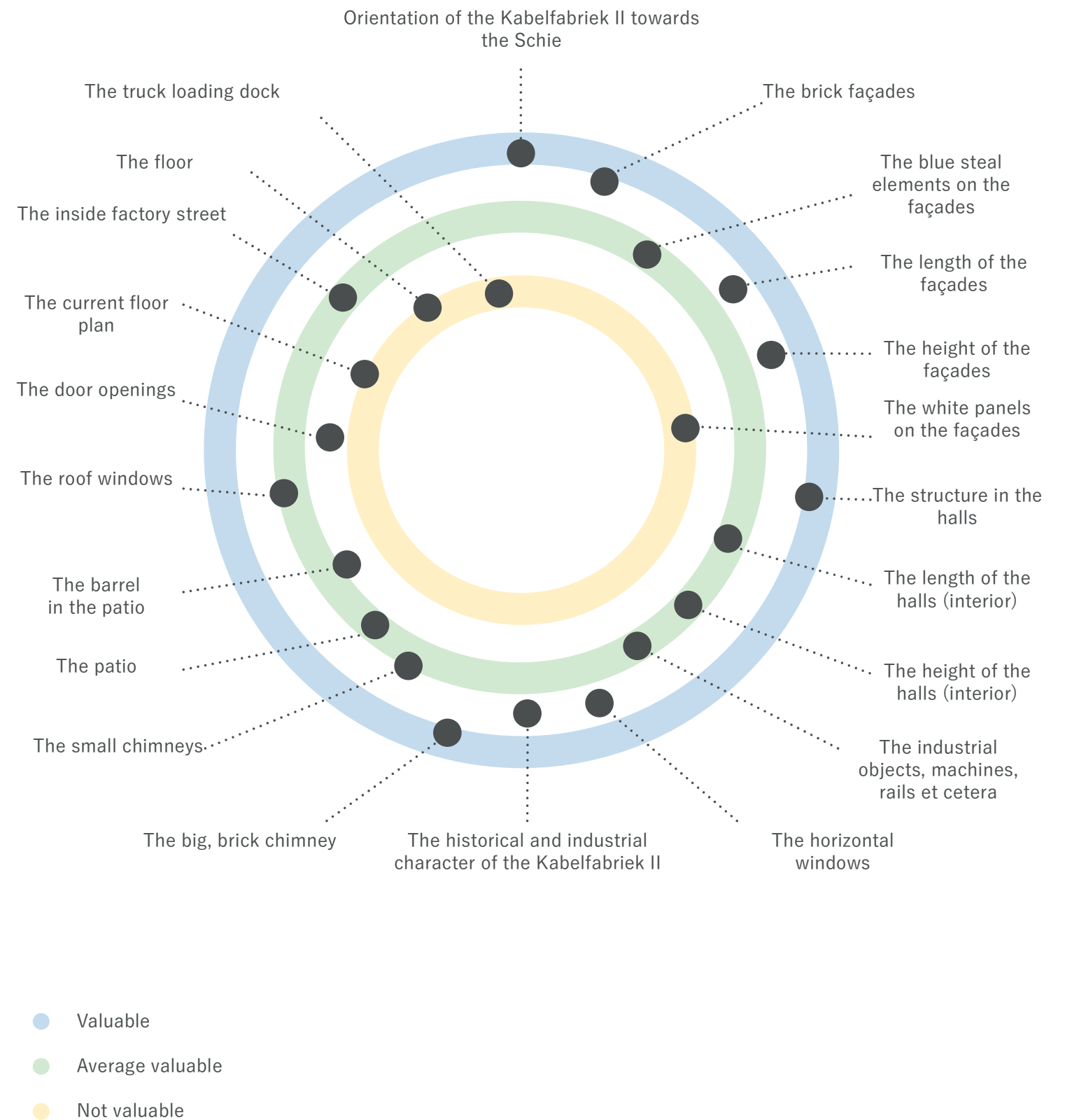
All the surveys were collected and processed. At the end of the survey each participant choose a new function for the Kabelfabriek II. This is not part of the values and attributes assessment.

The diagram alongside shows the conclusion of the survey. The coloured circles represent the three different values. Around the circles you see the attributes. On the next page you see more detailed what the percentages and proportions of the valued attributes are according to the different stakeholders. On page nine the outcome in a values and attributes assessment is shown in a floor plan and facade drawing.

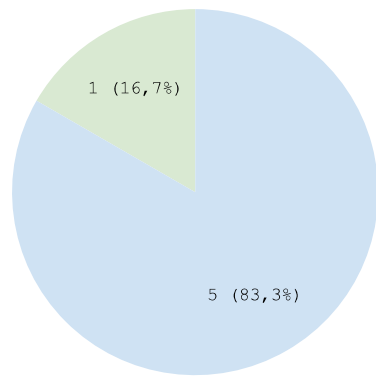
As can be seen in the diagram, the attributes ‘Orientation of the Kabelfabriek II towards the Schie’, ‘The structure in the halls’ and ‘The big, brick chimney’ are valued the most. On the contrary the attributes ‘The white panels on the façades’, ‘The current floor plan’, ‘The floor’ and ‘The truck loading dock’ are valued the least.

Surprisingly, the outcome of the survey on the attribute ‘The structure in the halls’ was divided into the neighbour stating that it was not valuable and the other participants stating that it is valuable. Furthermore, the architect was the only one who stated that the floor is of value. This contradicted the other participants, who stated it was not of value at all.

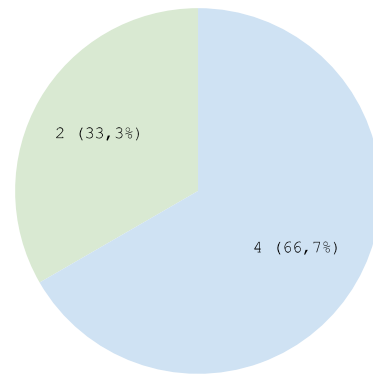
There are six attributes of which the opinions are divided into valuable, average valuable and not valuable: ‘The length of the halls (interior)’, ‘The height of the halls (interior)’, ‘The industrial objects, machines, rails et cetera’, ‘The patio’, ‘The barrel in the patio’ and ‘The inside factory street’.



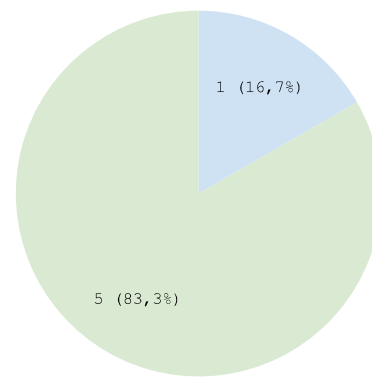
Orientation of the  
Kabelfabriek II towards  
the Schie



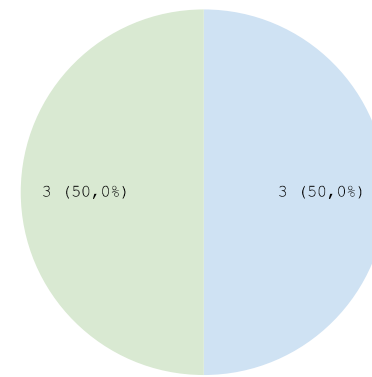
The brick façades



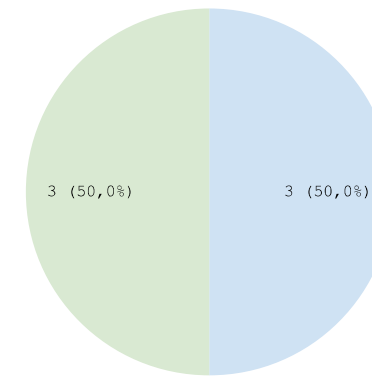
The blue steal elements on  
the façades



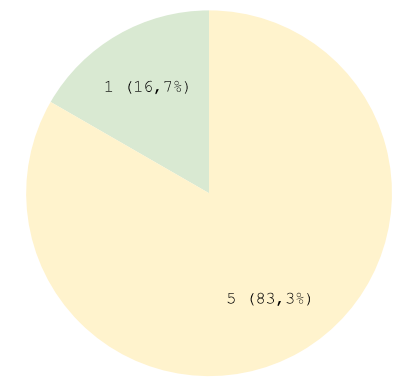
The length of the façades



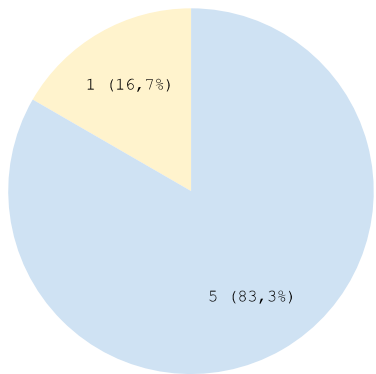
The height of the façades



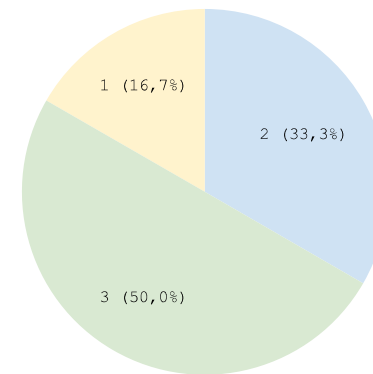
The white panels on the  
façades



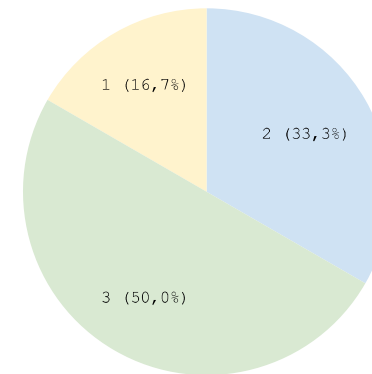
The structure in the halls



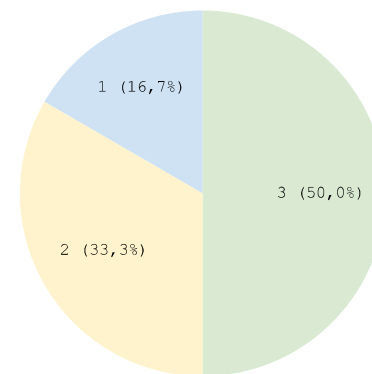
The length of the halls  
(interior)



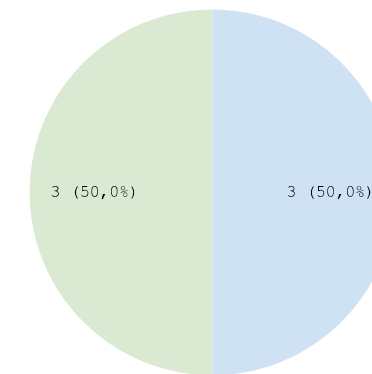
The height of the halls  
(interior)



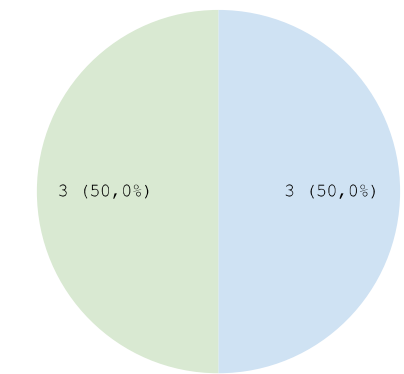
The industrial objects,  
machines, rails et cetera



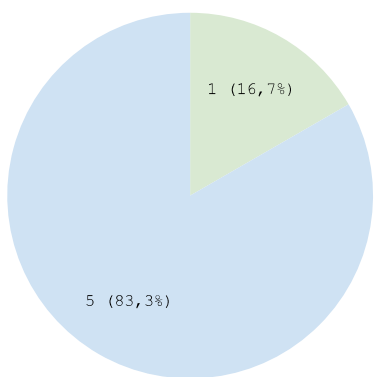
The horizontal windows



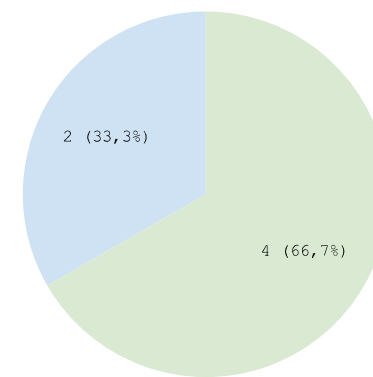
The historical and  
industrial character of  
the Kabelfabriek IIW



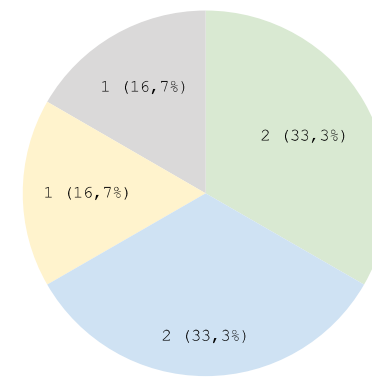
The big, brick chimney



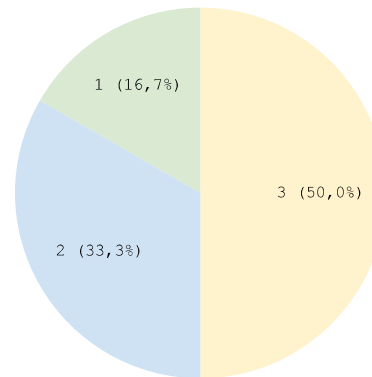
The small chimneys



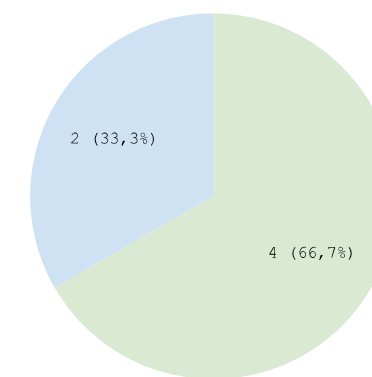
The patio



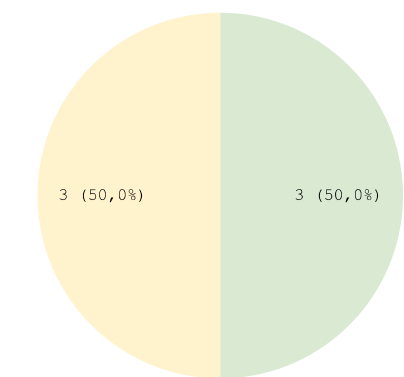
The barrel in the patio



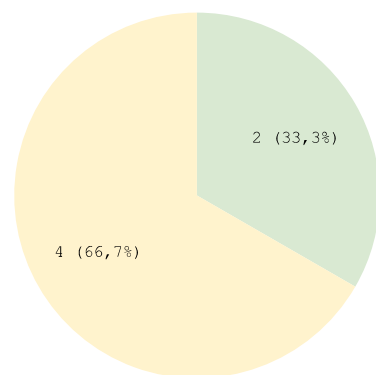
The roof windows



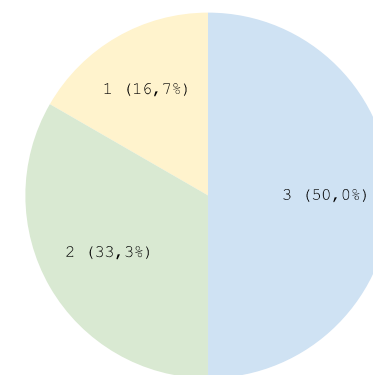
The door openings



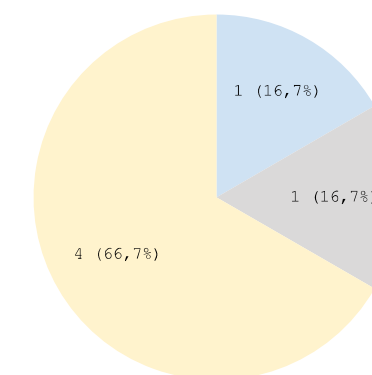
The current floor plan



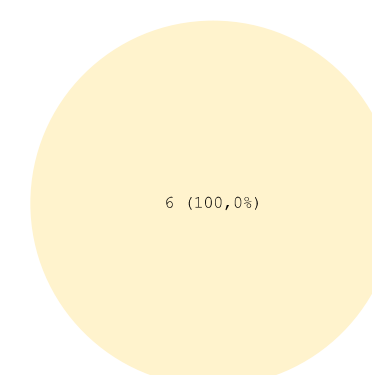
The inside factory street



The floor



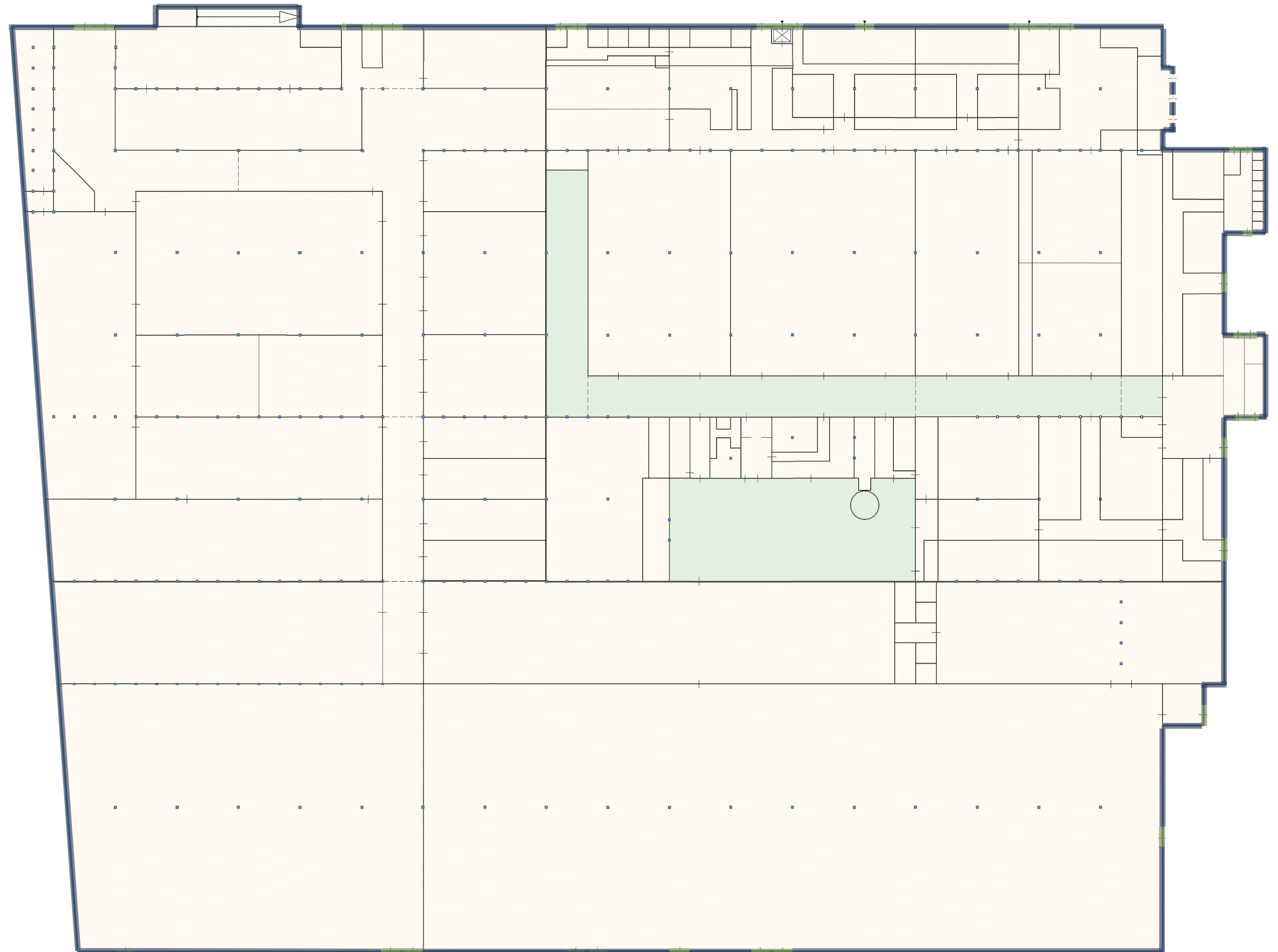
The truck loading dock



- High value
- Average value
- Low value
- Not filled in

1:1000

- High value
- Average value
- Low value

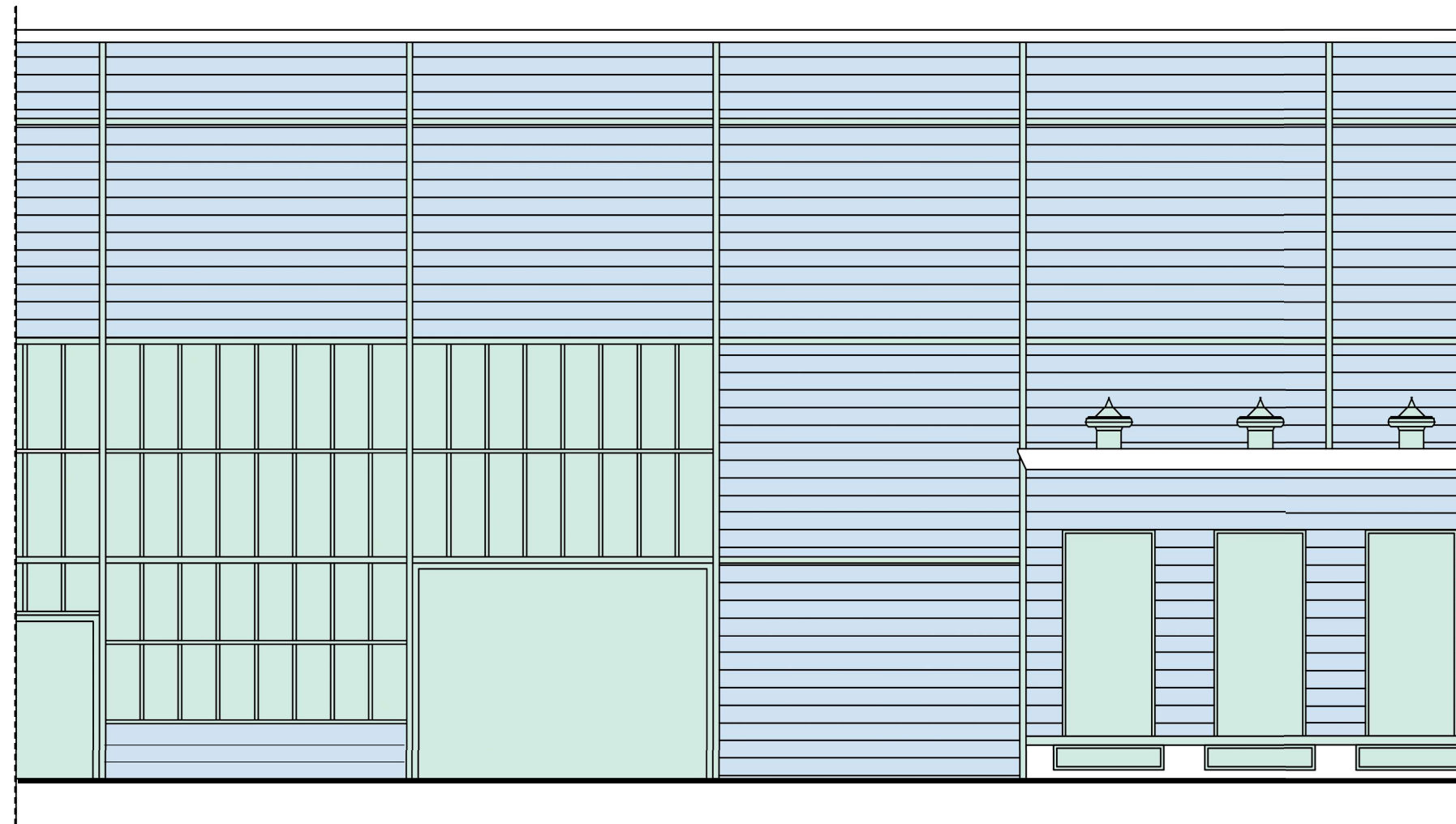




# EAST FACADE

1:1000

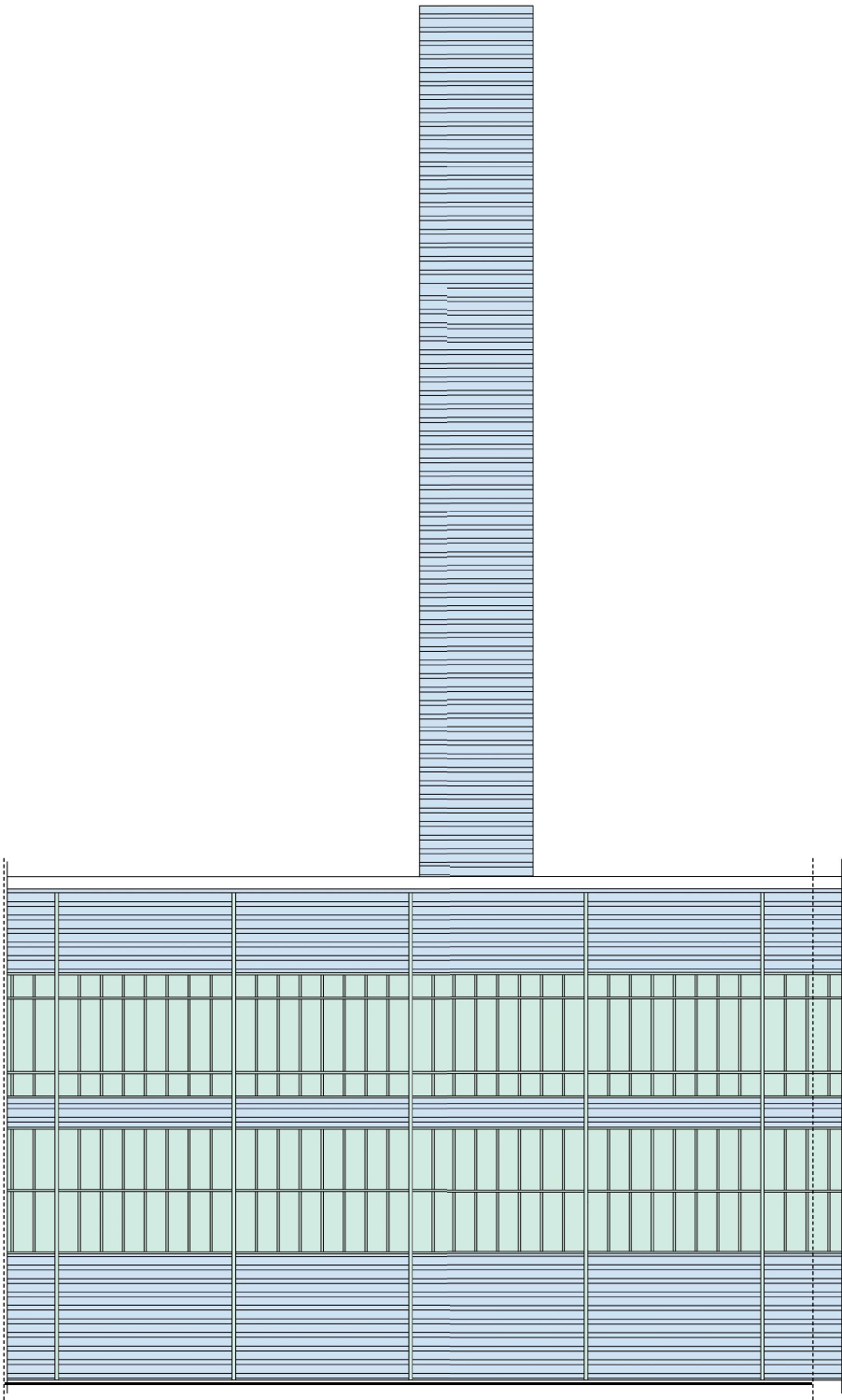
- High value
- Average value
- Low value



NORTH FACADE

1:2000

- High value
- Average value
- 



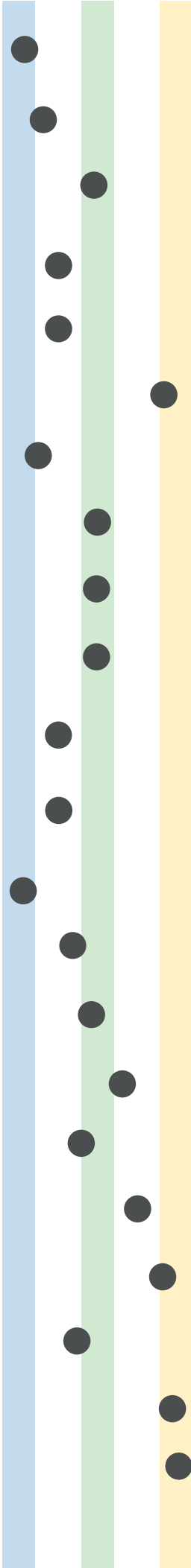
Outcome Values & Attributes survey 1:2000 North Facade (Tol, 2020)

AUTHOR’S VALUES ASSESSMENT

This page shows the comparison between the opinions of the stakeholders and the author. The opinion of the author is expressed succinctly. The next pages present on a more detailed and zoomed in level how the specific elements of the Kabelfabriek II are valued by the author.

- High value
- Average value
- Low value

Values



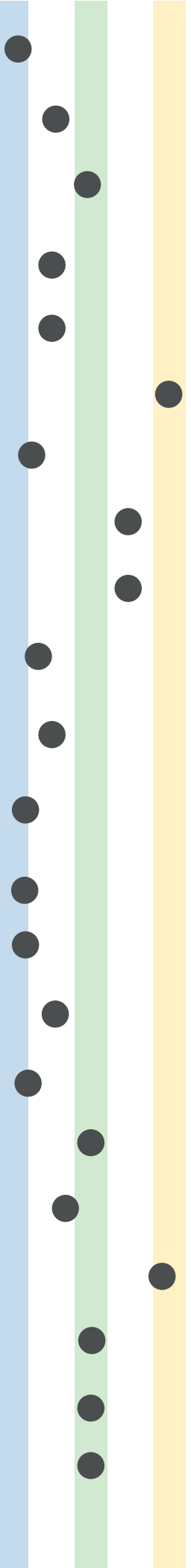
Attributes

- Orientation of the Kabelfabriek II towards the Schie
- The brick façades
- The blue steal elements on the façades
- The length of the façades
- The height of the façades
- The white panels on the façades
- The structure in the halls
- The length of the halls (interior)
- The height of the halls (interior)
- The industrial objects, machines, rails et cetera
- The horizontal windows
- The historical and industrial character of the Kabelfabriek II
- The big, brick chimney
- The small chimneys
- The patio
- The barrel in the patio
- The roof windows
- The door openings
- The current floor plan
- The inside factory street
- The floor
- The truck loading dock

Pien

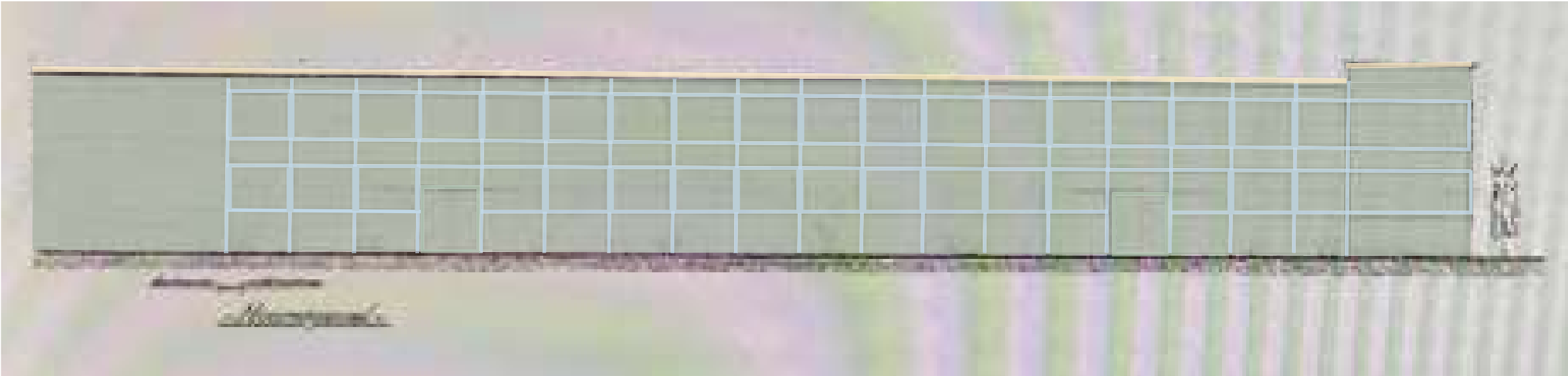
- Agree, new green park and Schie. Other orientation also of importance
- Agree. The masonry should be kept. The façades can be adapted.
- Agree - Rhythm!
- Agree. Total sizes should be visible.
- Agree. Total sizes should be visible.
- Added later, not valuable.
- Agree, especially public spaces.
- Partly.. not needed everywhere.
- Partly.. not needed everywhere inside. Exterior more important.
- Represents the industrial character.
- Agree, architecture of the factory.
- Important! Is part of different attributes.
- Represents the industrial objects.
- Represents the industrial objects.
- Interesting unexpected space, human scale. Should create more of these!
- Represents the industrial objects.
- Partly.
- Represents the industrial character of the factory.
- Of importance: the patio and the indoor street.
- Is not how it used to be, can be changed.
- Represents industrial character.
- Represents industrial character.

Values

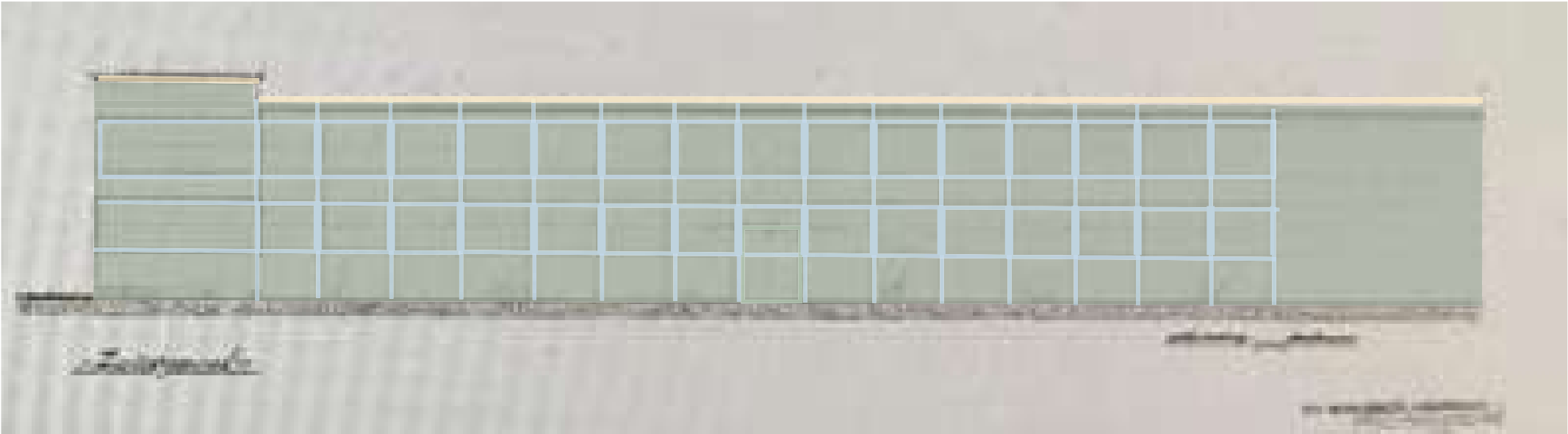


These facade drawings show how the façades are valued. The next two pages show the value assessment, which is done on a more detailed, zoomed in level. Concluding it can be stated that the rhythm of the facade is valuable. In contrary to the roof molding, which is valued low. The masonry is valued as average value, which means that adaption is possible. The horizontal windows are rated as average value and high value. For example the thin steal window frames are valued high, but can be adapted to make the building sustainable as long as the look and feel of the frame is preserved.

- High value
- Average value
- Low value



North facade (Stadsarchief Delft, 2020)

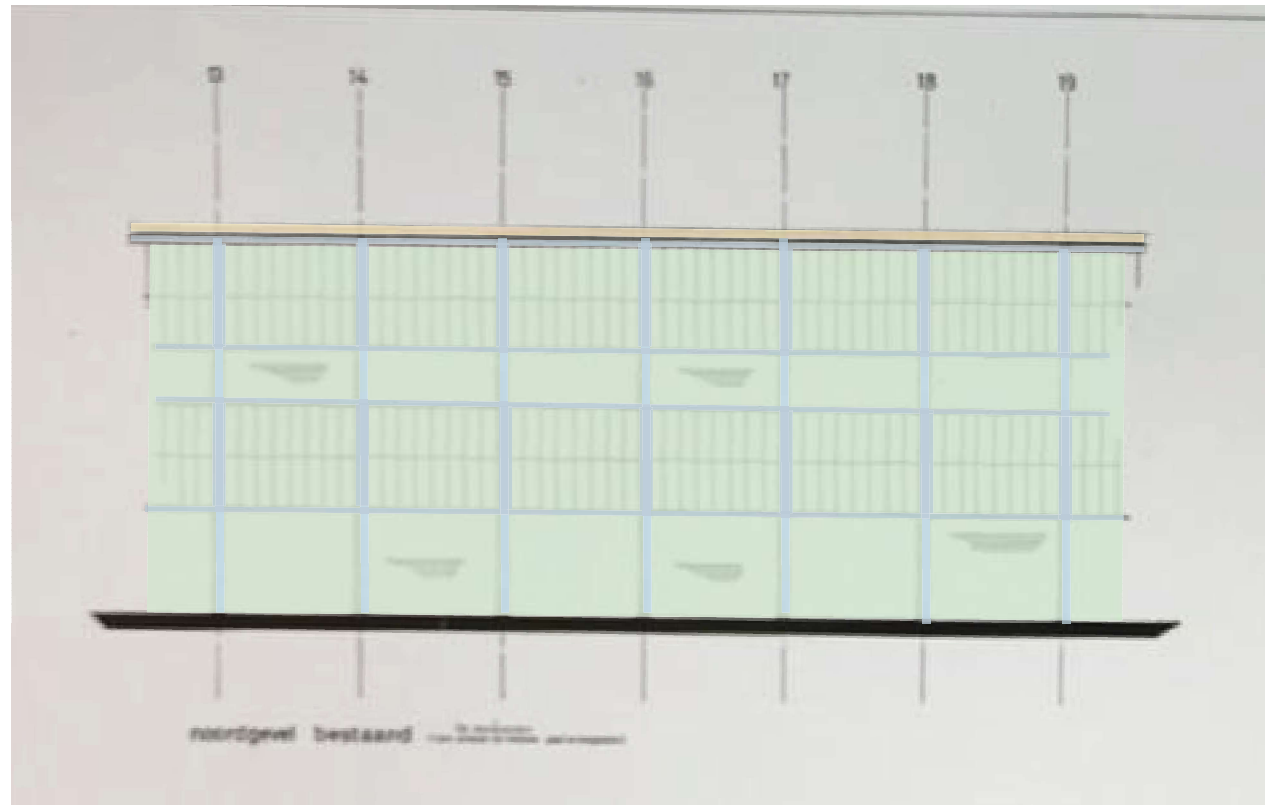


South facade (Stadsarchief Delft, 2020)

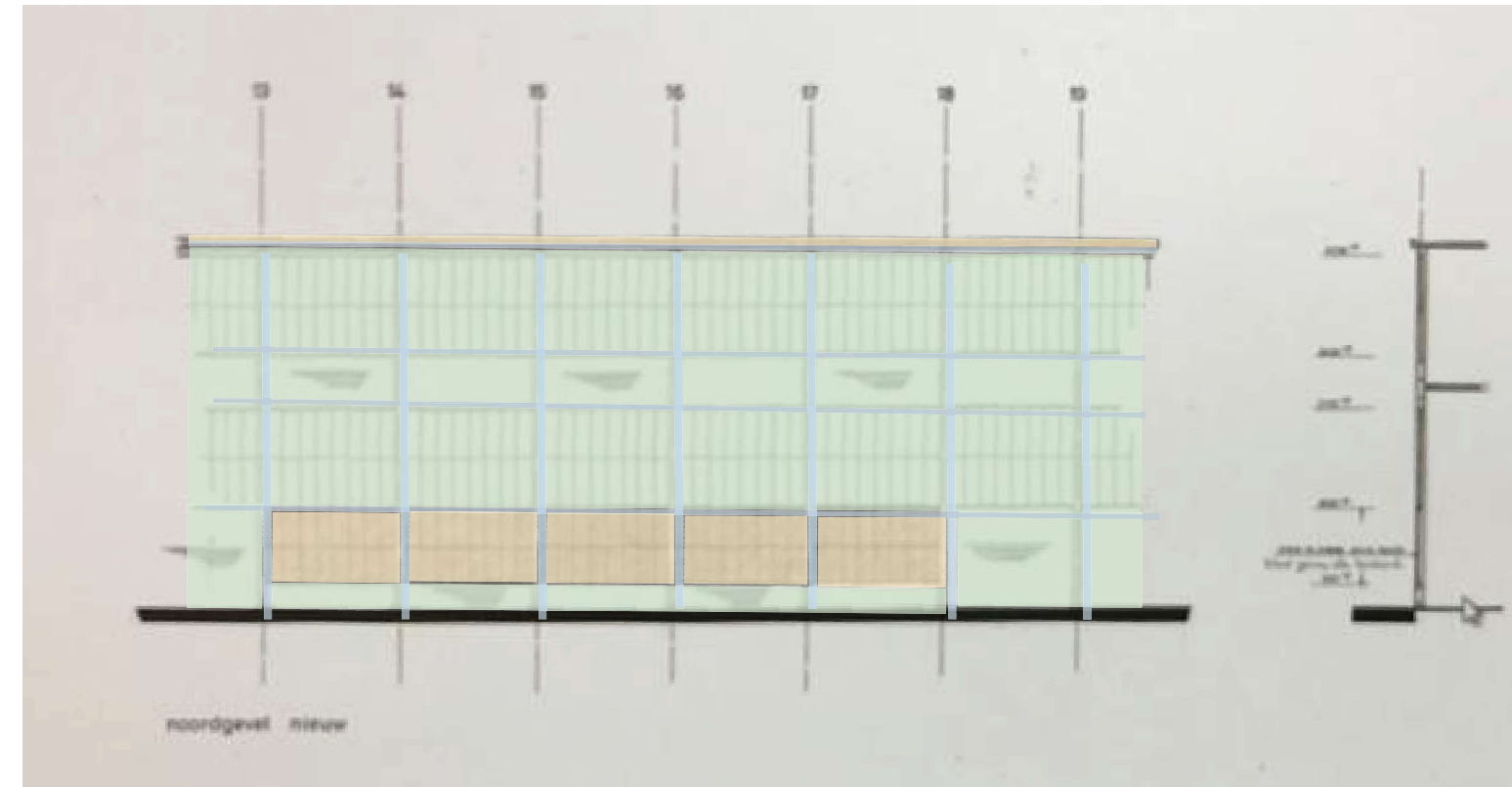
These drawings show the same important rhythm of the facade, created by the blue steel facade elements/frames.

'Newly' made adaptation on the facade are valued low (yellow), since they are not part of the original facade. This means they can be removed. However they are in line with possible future adaption, since the rhythm of the facade was kept and taken into account.

- High value
- Average value
- Low value



'Old' north facade (Stadsarchief Delft, 2020)



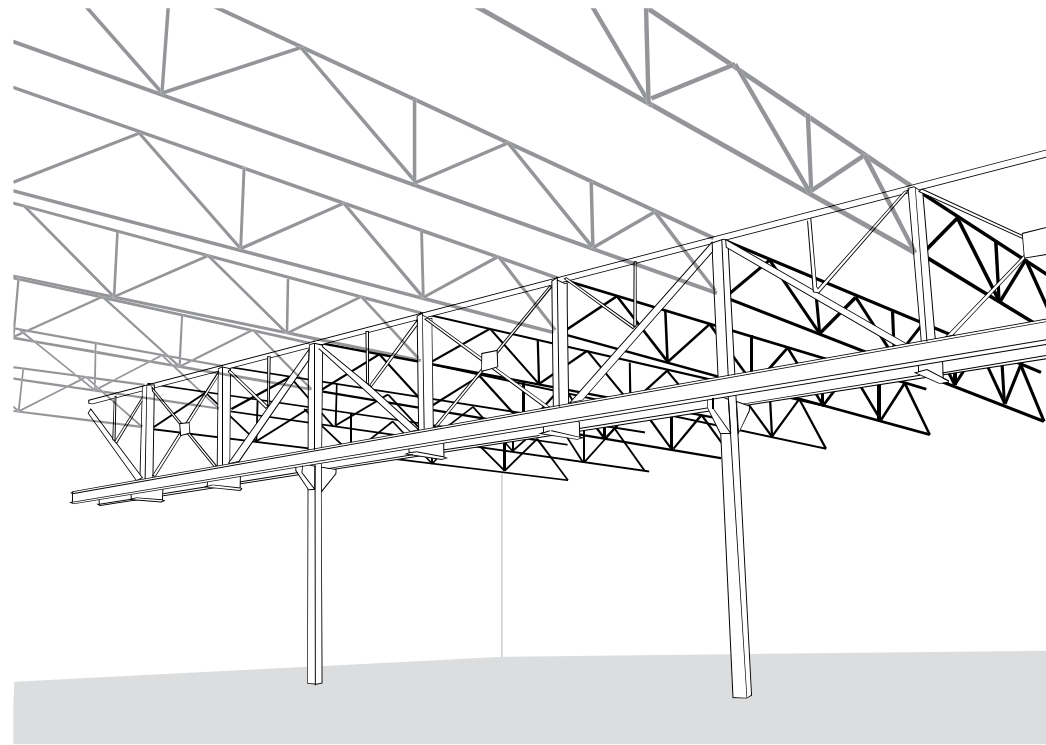
'New' north facade (Stadsarchief Delft, 2020)



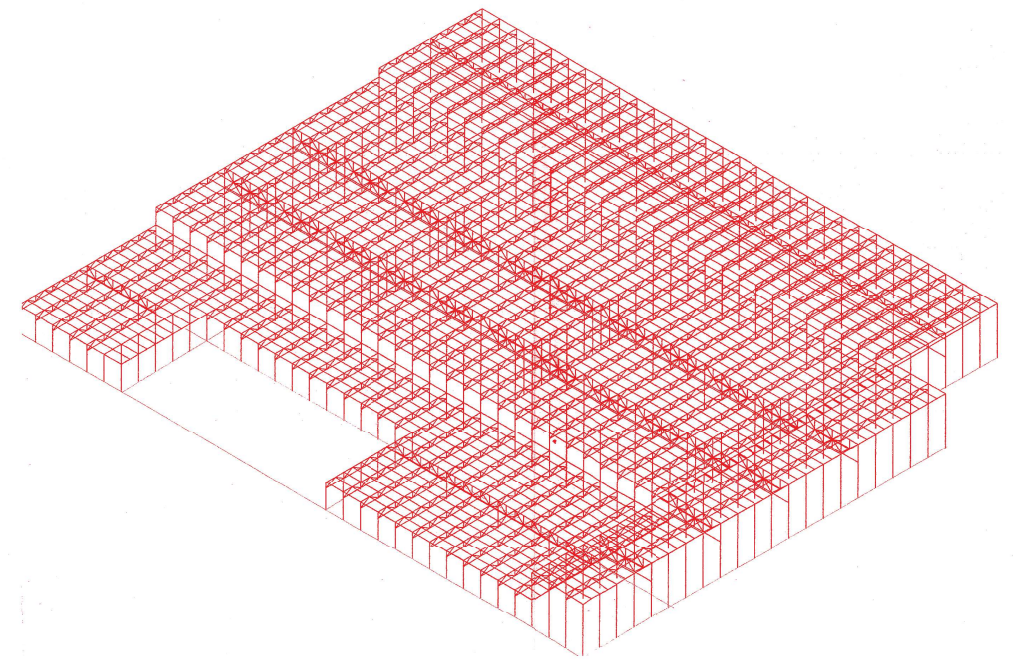


## CONSTRUCTION

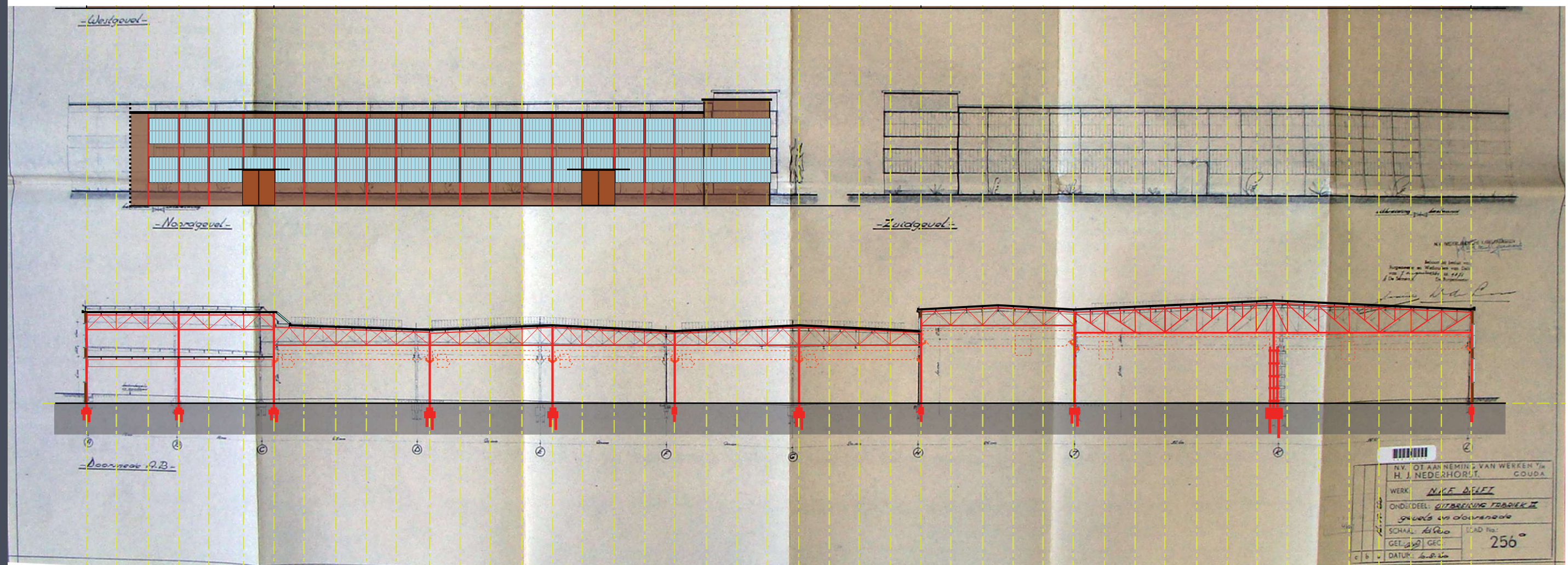
The Kabelfabriek II is known for its steel construction, lattice girders, which are typical for factory halls in order to span large distances. The colour of the beams and columns inside the building are dark green. The grid construction is based on distances of 5 metres in north south direction. The span of the beams is dependent on the width of the factory hall. The height of the columns is dependent on the height of the factory hall.



Structure of the Kabelfabriek II (Schoenmaker, 2011)



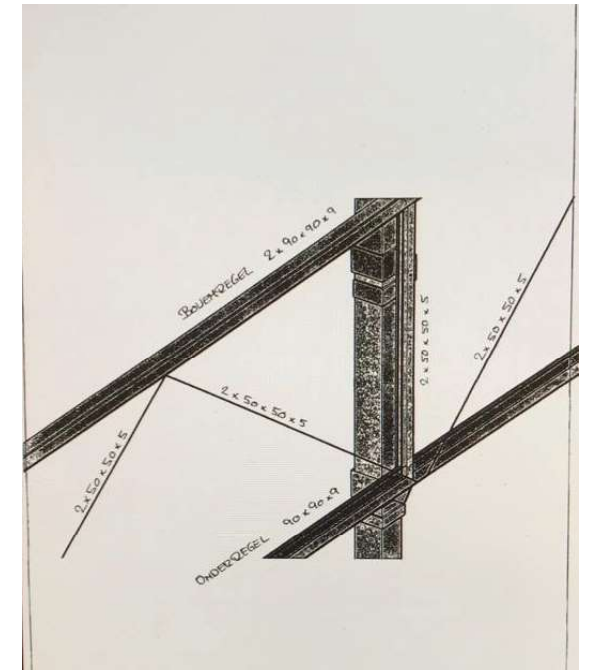
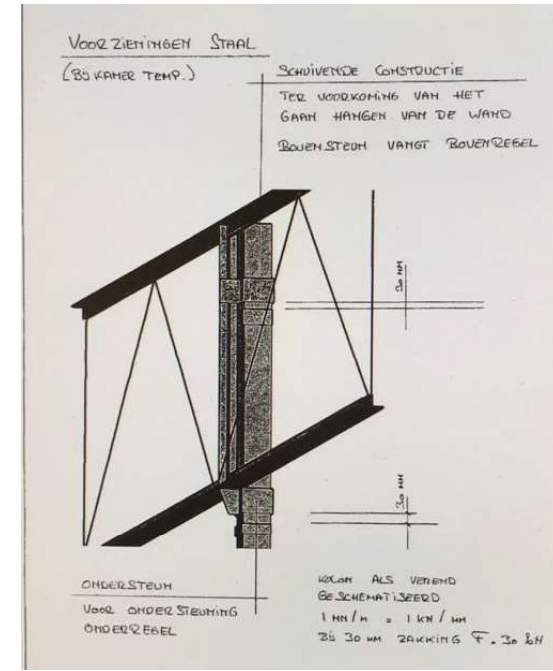
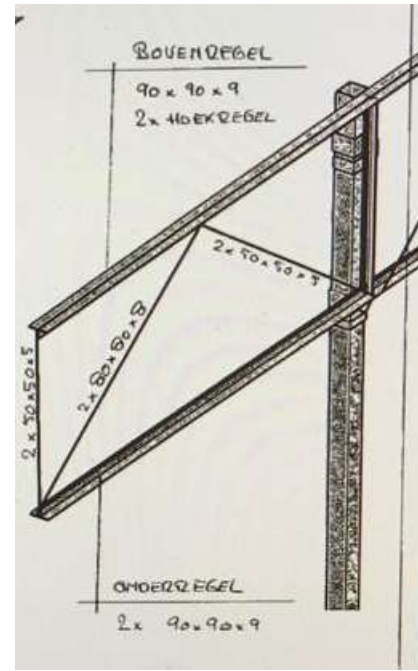
North part of the structure of the Kabelfabriek II (Schoenmaker, 2011)



Structure of the Kabelfabriek II (Schoenmaker, 2011)



The assumption is made that the beams, columns and lattice girders are bolted and welded. Steel is recyclable and reusable. The bolted connections can be disassembled by loosening the bolts. The welded connections can be disassembled by cutting the welded connections.



Details of the steel structure (Stadsarchief Delft, 2020)



Beams Kabelfabriek II (Tol, 2020)



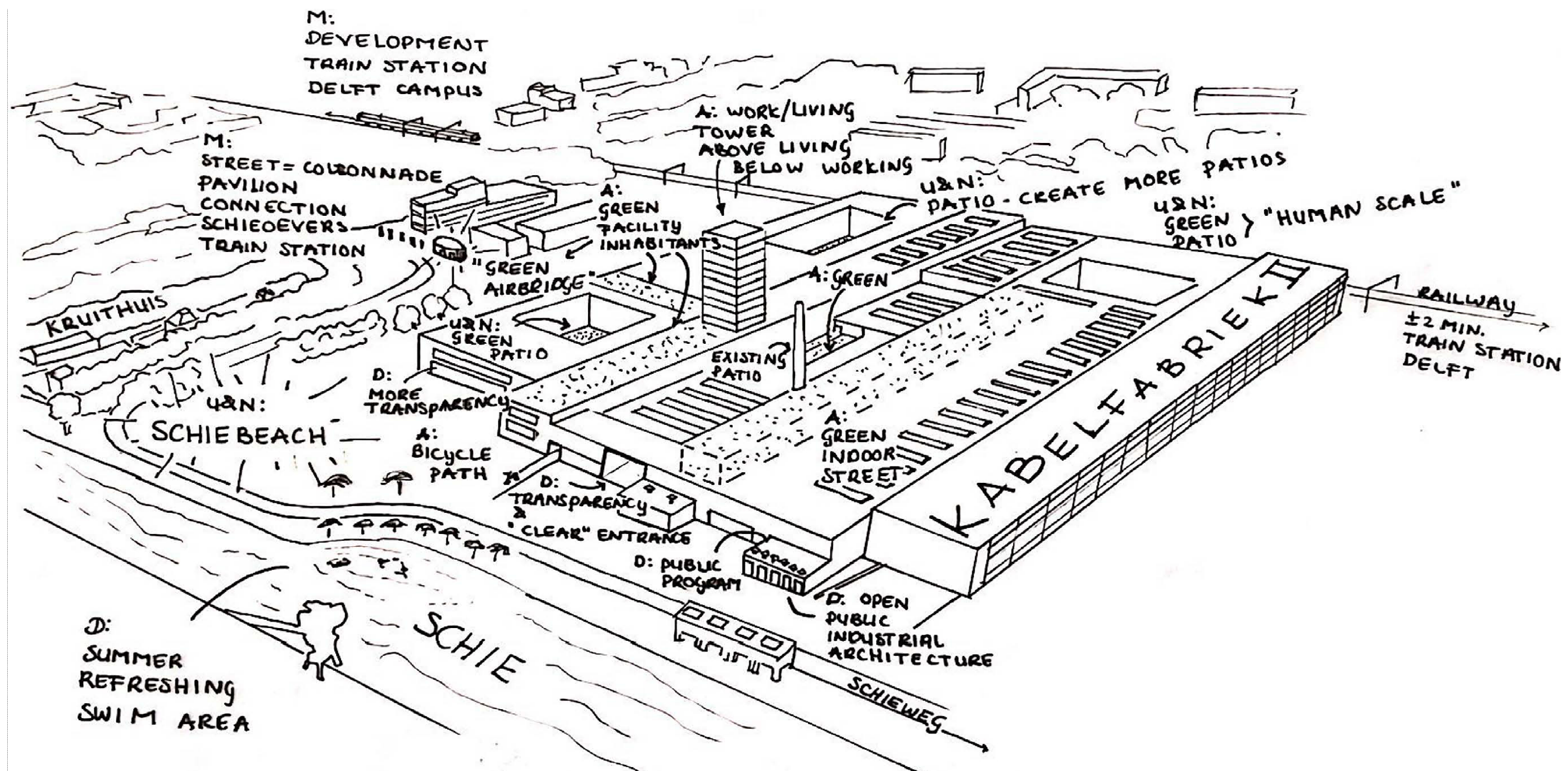
Beams Kabelfabriek II (Tol, 2020)



## SUMMARY STAKEHOLDERS INVOLVEMENT

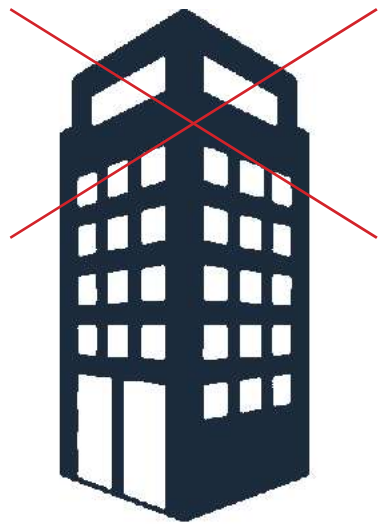
The needs, wishes and values of the stakeholders were put together by means of the research. Sixteen interviews were held with both expert and non-expert stakeholders. Furthermore, to this purpose a Minecraft workshop was held.

All this information, in other words, the inputs of the stakeholders is shown in this drawing. For example a current user and neighbour of the Kabelfabriek II suggested to create more, green patios.

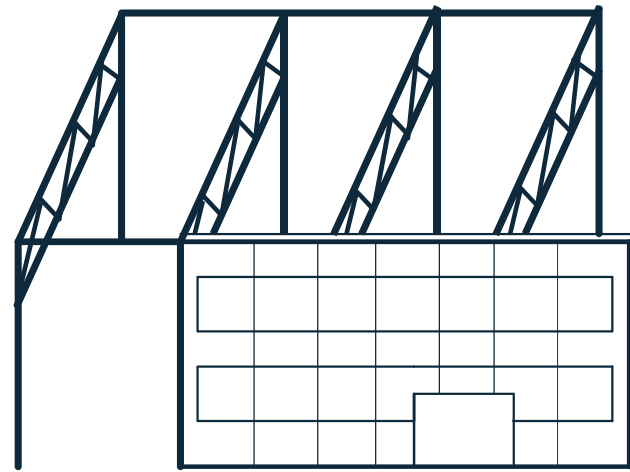


## CONCLUSION STAKEHOLDERS INVOLVEMENT

The following four images represent the conclusion of the stakeholders.

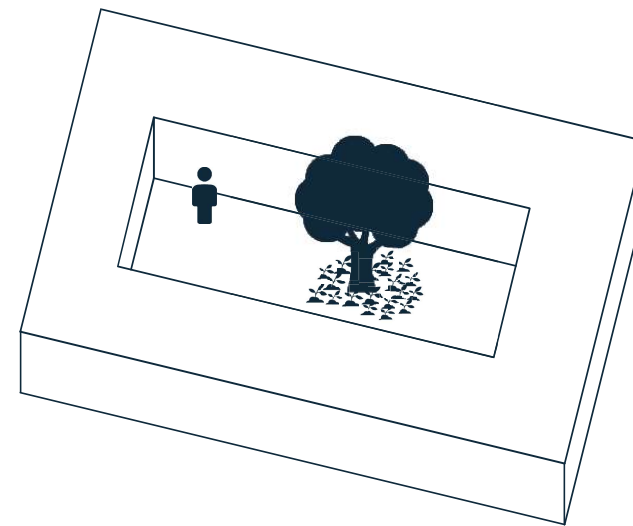


Less high rise



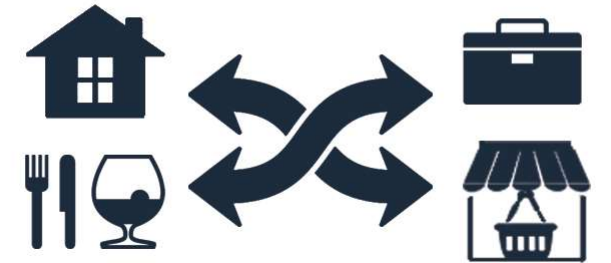
Preserve the construction and skin

The length and height of the skin should be preserved, as well as the orientation of the factory towards the canal Schie.



More patios with human scale and green

More patios should be added in order to feel the human scale in the factory, as in the original patio. Furthermore, the green of Schiepark should be taken into the factory.



A mixed use

A mixed use in the whole factory: working, living, shops, horeca facilities.

**Skin**

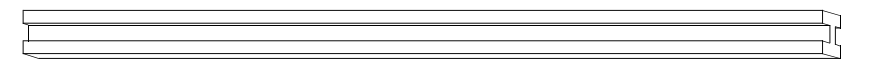
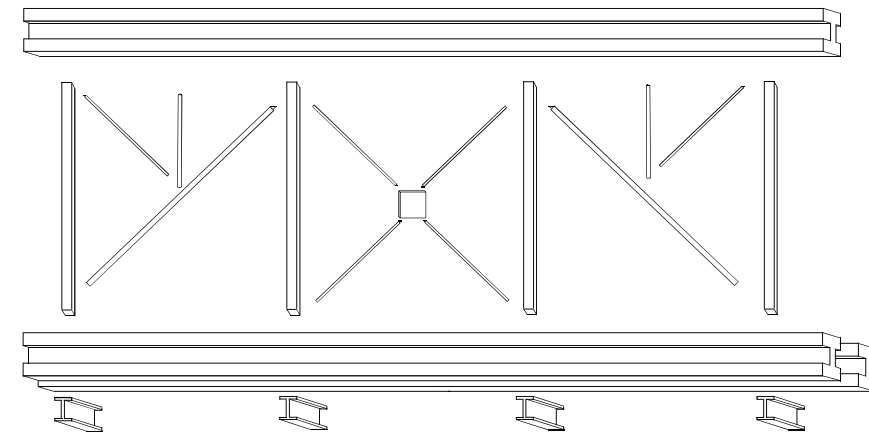
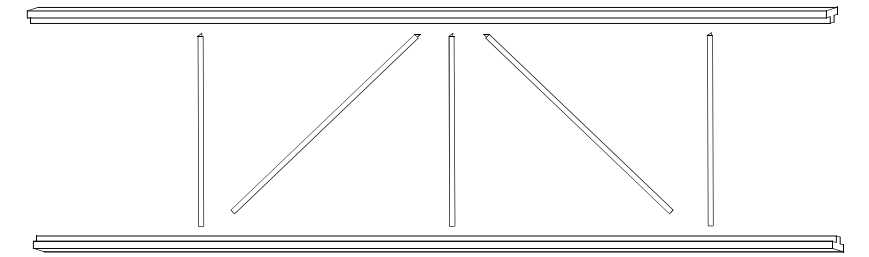
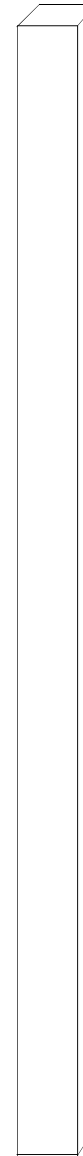
The skin of the Kabelfabriek II needs to be preserved. Any adaptation on the outside of the façades needs to be done whilst the rhythm of the façades is taken into account. This means that not the entire skin needs to be preserved. However the original length and height should be tangible. In terms of insulating the factory, the inside of the façades is applicable.

Regarding the horizontal, existing windows of the skin, the thinness of its frames, the glassing, no outer sill, the blue colour of the frames and the sizes, height and width of the windows, need to be taken into account when redesigning in order to preserve the look, touch and feel of the existing skin.

Regarding the roof and its roof line which is not highly valued, it is crucial, in order to maintain the look of the existing façade, to preserve the present shape of the roof line. Since the roof beams are valued highly, the roof should be insulated from the outside.

**Construction**

The construction needs to be preserved in the public, outside spaces to maintain the industrial character of the factory. However the amount of beams, columns and lattice girders can be reduced and therefore can be reused for new buildings. Regarding the construction inside the existing building volumes, the construction will be used where possible and amplified if needed. The drawings alongside show the different elements of the construction (e.g. beams and columns).



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CURRENT SITUATION

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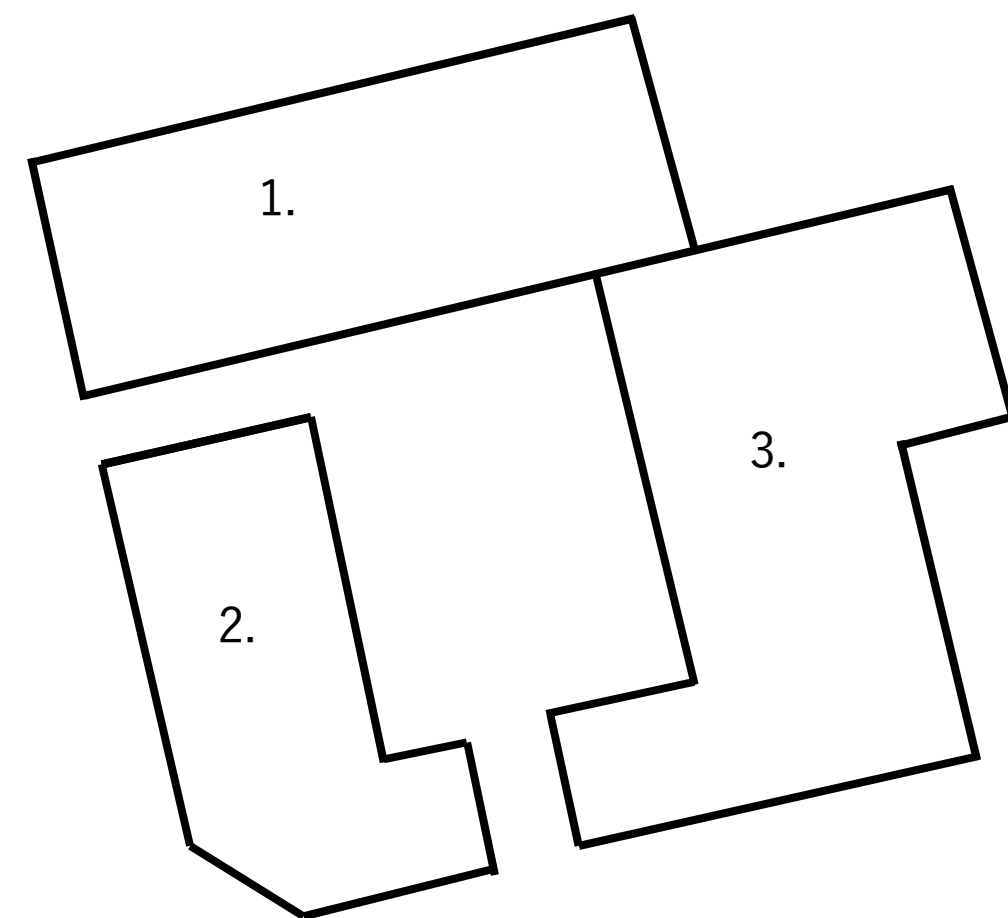
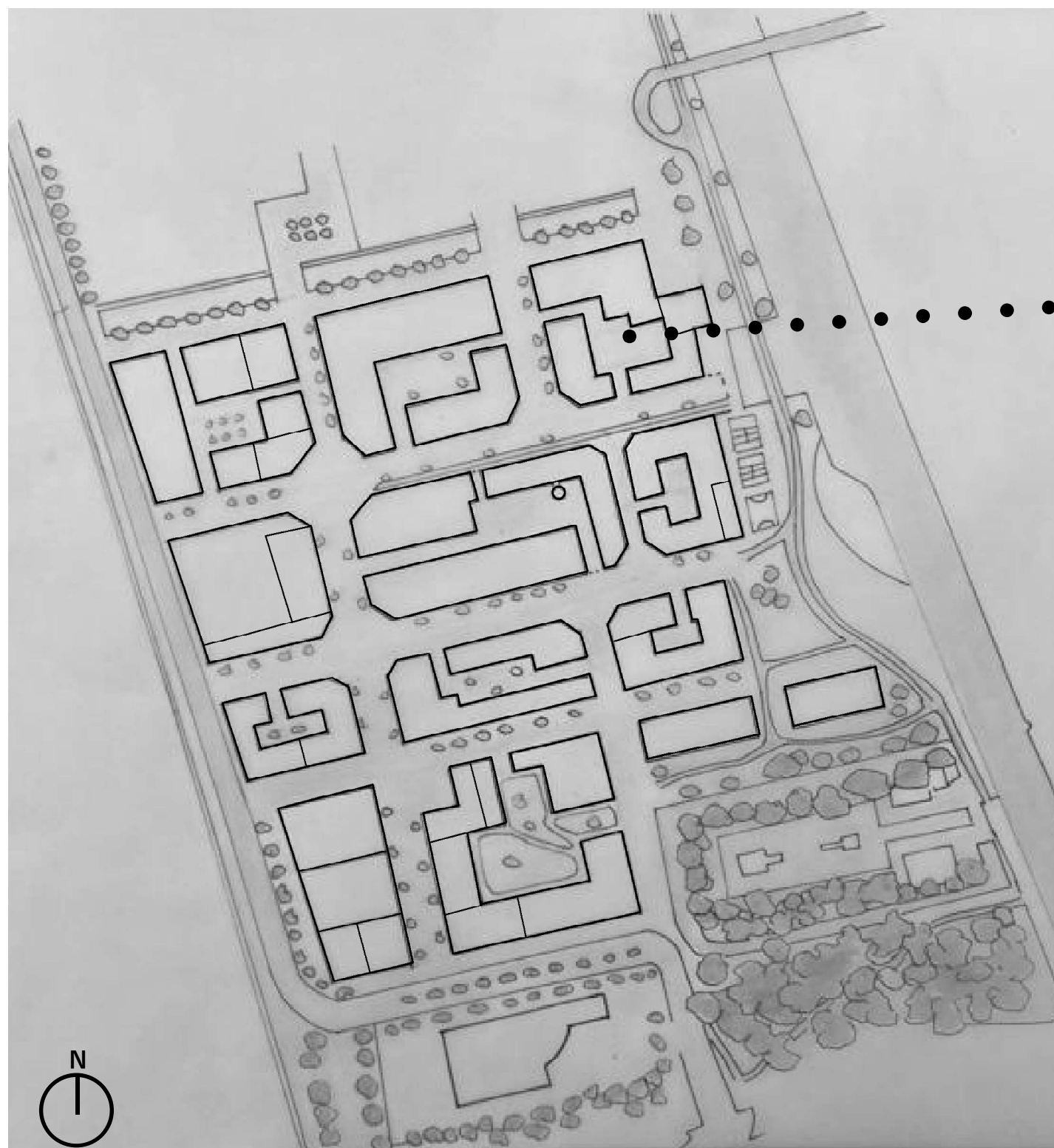
In the research booklet can be read that one of the sub-questions of the research is:  
How to redesign Kabelfabriek II Delft on sustainable attributes while preserving cultural value?

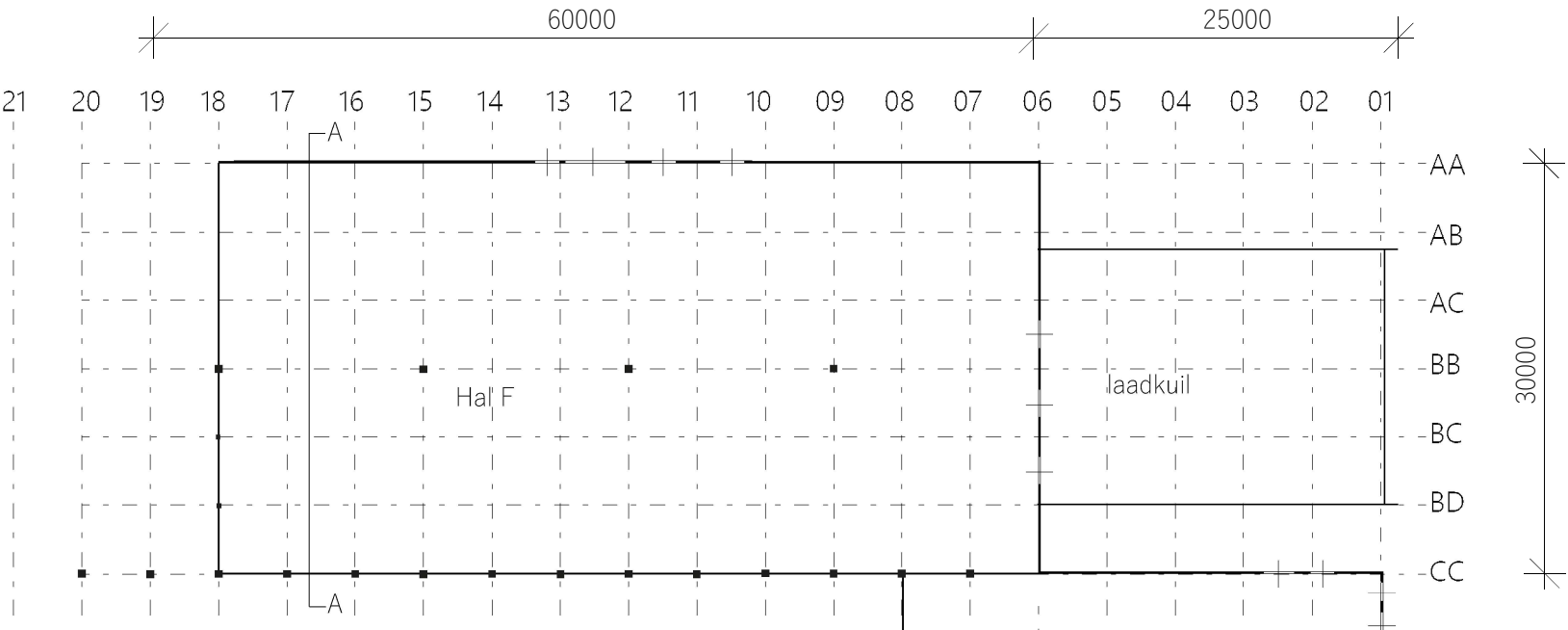
The answer to this is not simple and unilateral. There is not one way or one method to deal with redesigning heritage. However there is one thing all adaptive reuse projects should consist of and that is a research of the existing in order to design something that fits the building. Therefore this chapter explores the existing situation of the North East corner of the factory for which a redesign is made.

In order to distinguish each volume and to research what is the existing situation and heritage, I have divided the volumes into one, two and three, see next page.

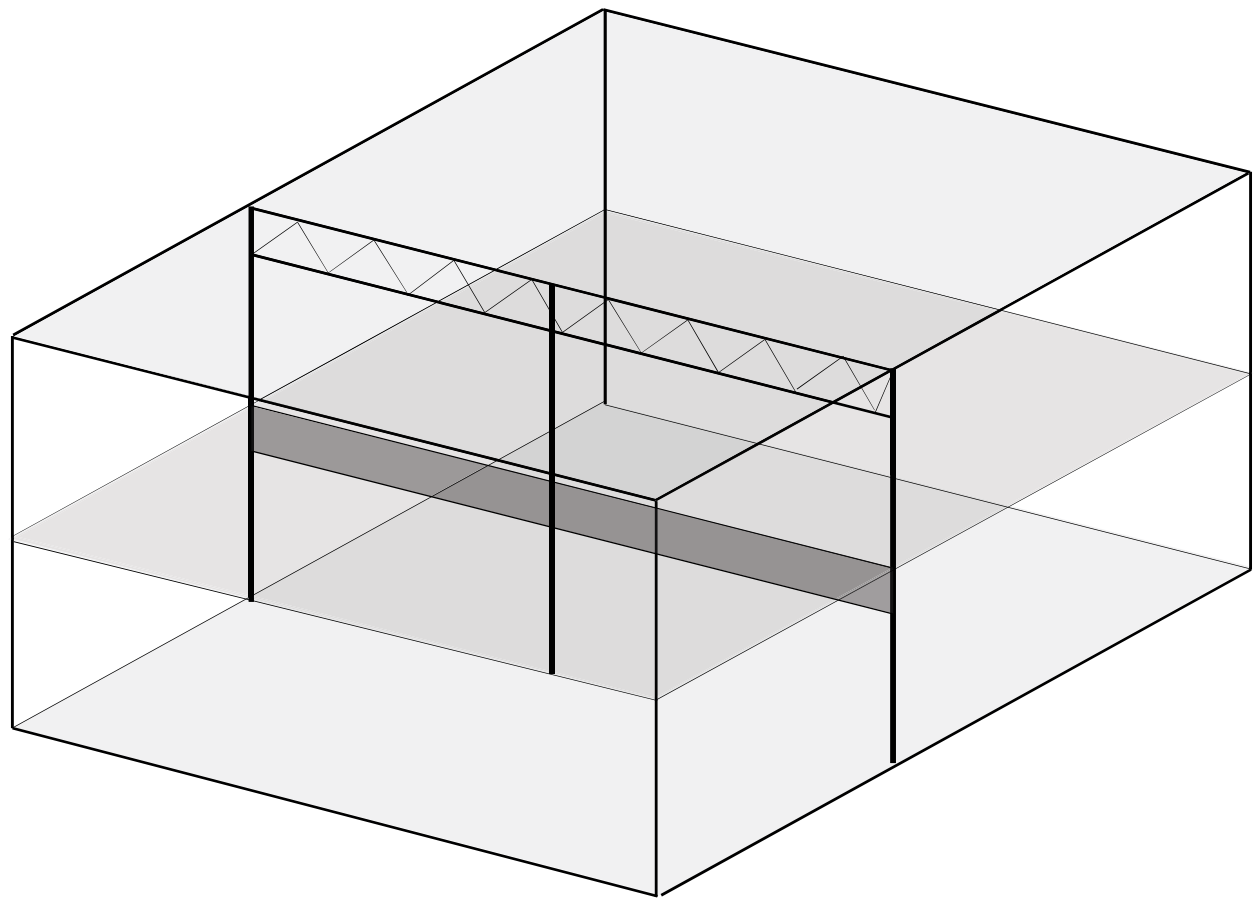


The drawing on the left shows the new urban plan, a result of the preliminary design during the research phase of the graduation year see research booklet 'Kabelfabriek 2.0'. The north east block will be redesigned. This block can be divided into three blocks. This chapter will zoom in on these three volumes to find out what the current situation is in order to know what to add and what can be used for its new destination.

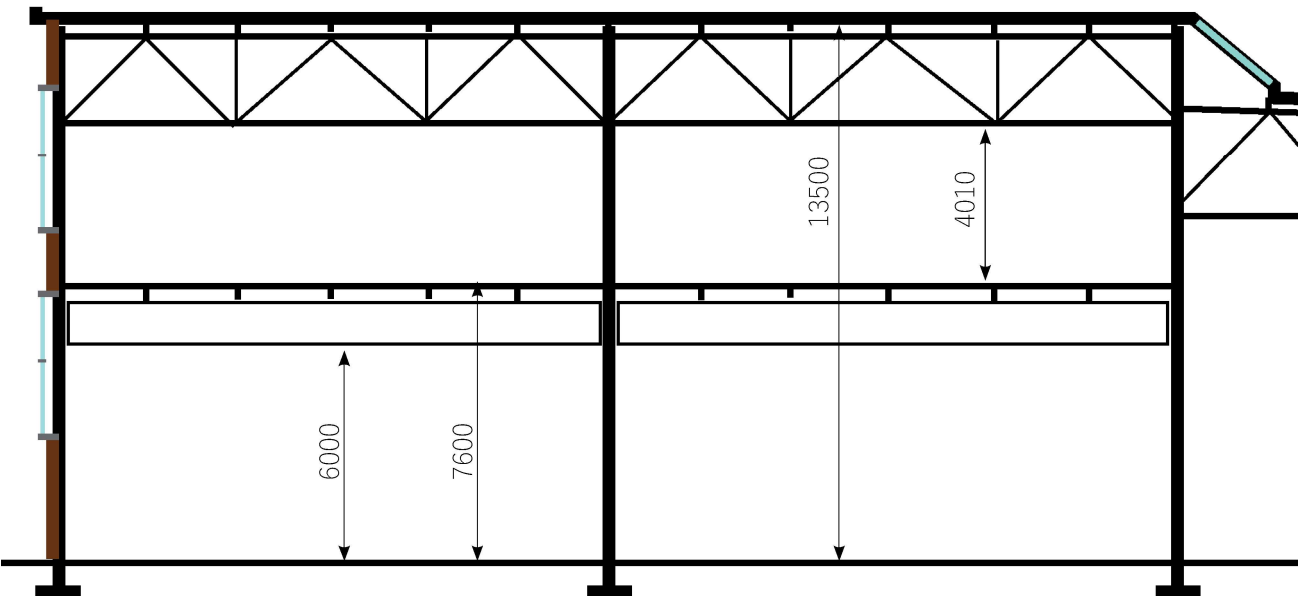




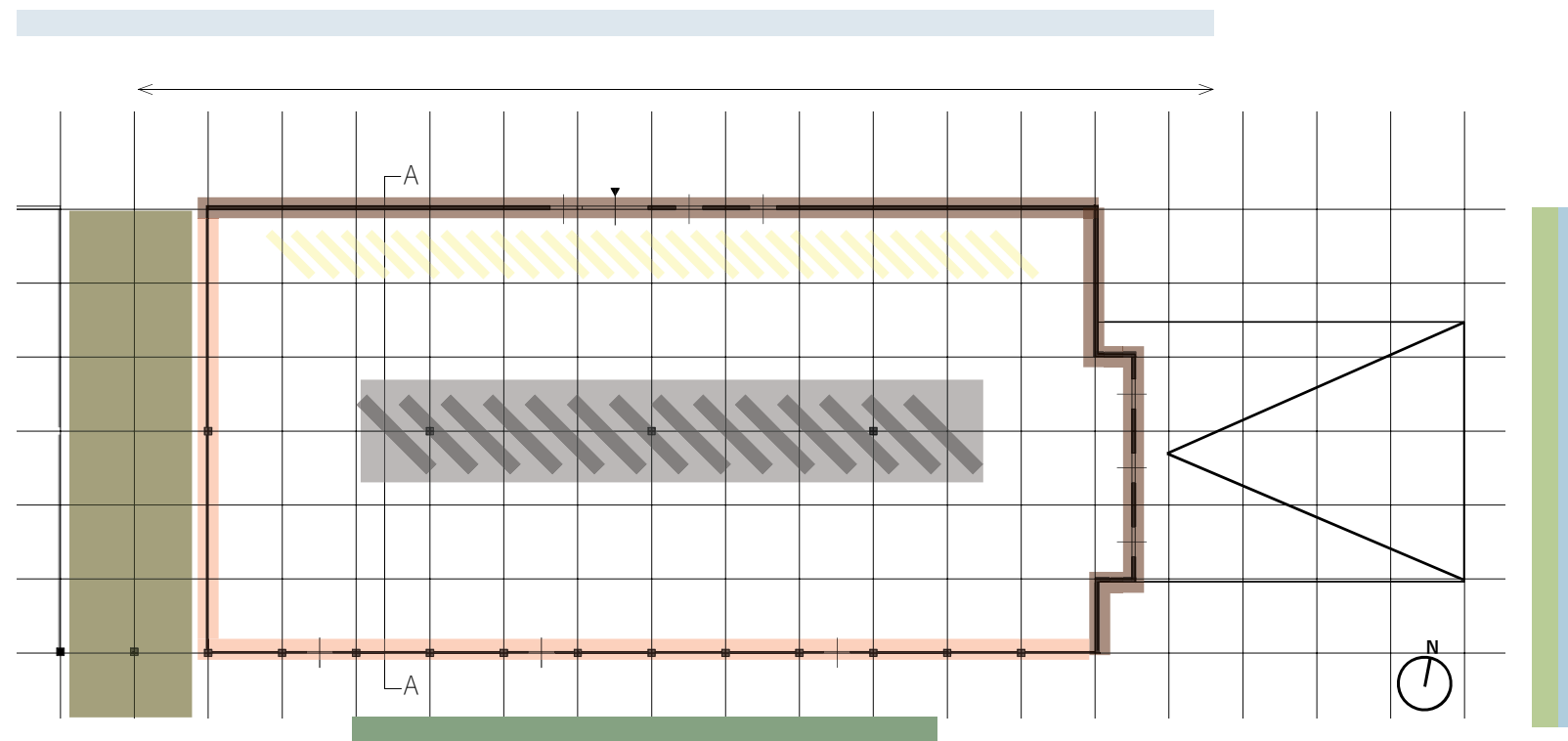
Floor plan 1:500



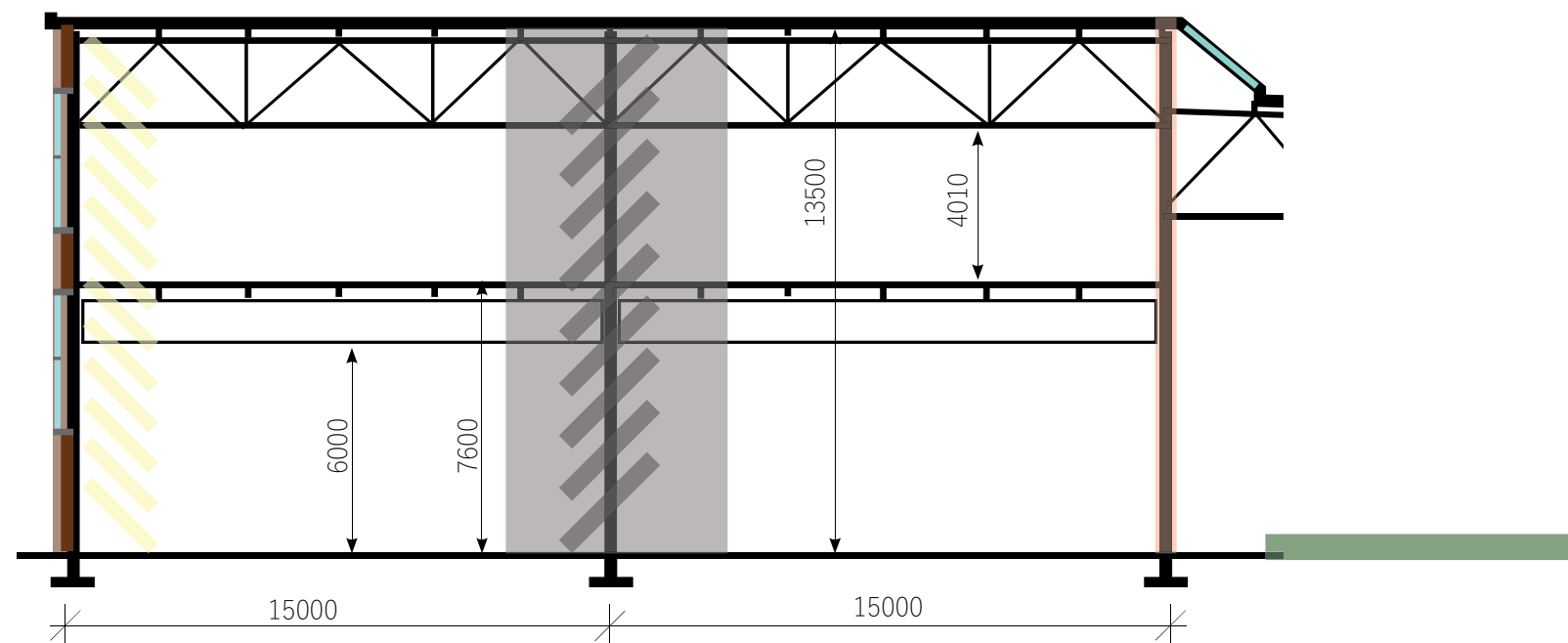
Axonometry



Section 1:500



Floor plan 1:500



Section 1:500

### Skin

The north and east façades are part of the existing skin of the factory. Furthermore, the north facade is adjacent to the public street, which is accessible by car. The newly built south facade is adjacent to the courtyard and the factory street.

### Light

The existing façades consist of large (around 20 m<sup>2</sup>) windows. However, the depth of the factory hall is 30 metres. This leads to a darker zone in the middle. The yellow zone is where the northern light enters the building, which is perfect for 'atelier dwellings'.

### Warmth/Cold

During winter times the factory halls are cold, since they are not heated and insulated. During summer times the heat should be kept out of the factory.

### Context

A public street, accessible by car, is located at the north, next to a small ditch. On the east side the former loading dock is situated, next to the green park and the canal Schie. On the south side, as mentioned above, a courtyard will be created. Lastly, on the west side lies one of the 'factory streets', which is only accessible by bike or on foot.

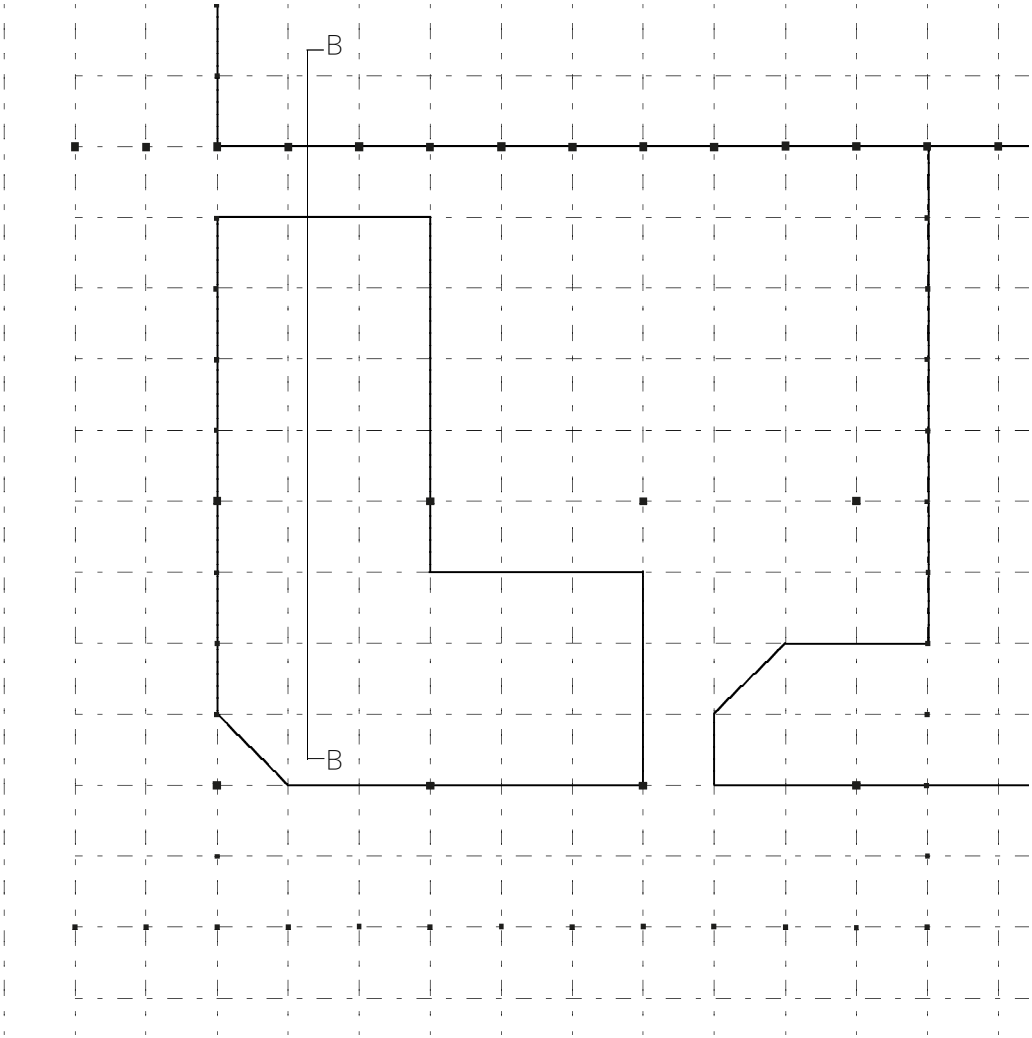
### Storey

Extra storeys can be added because of the large height of the factory halls, think of 'loft dwellings'.

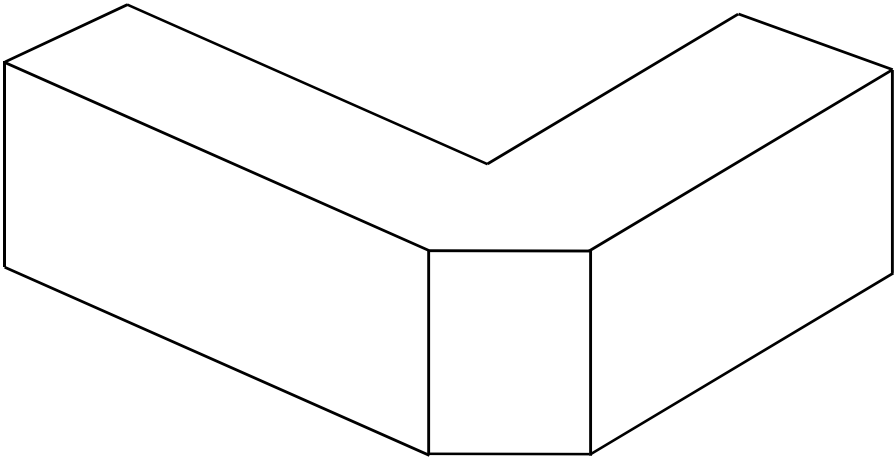
### Structure

The structure will give the dwellings/workspaces the industrial character. However, sound pollution is a critical point to pay attention to when designing.

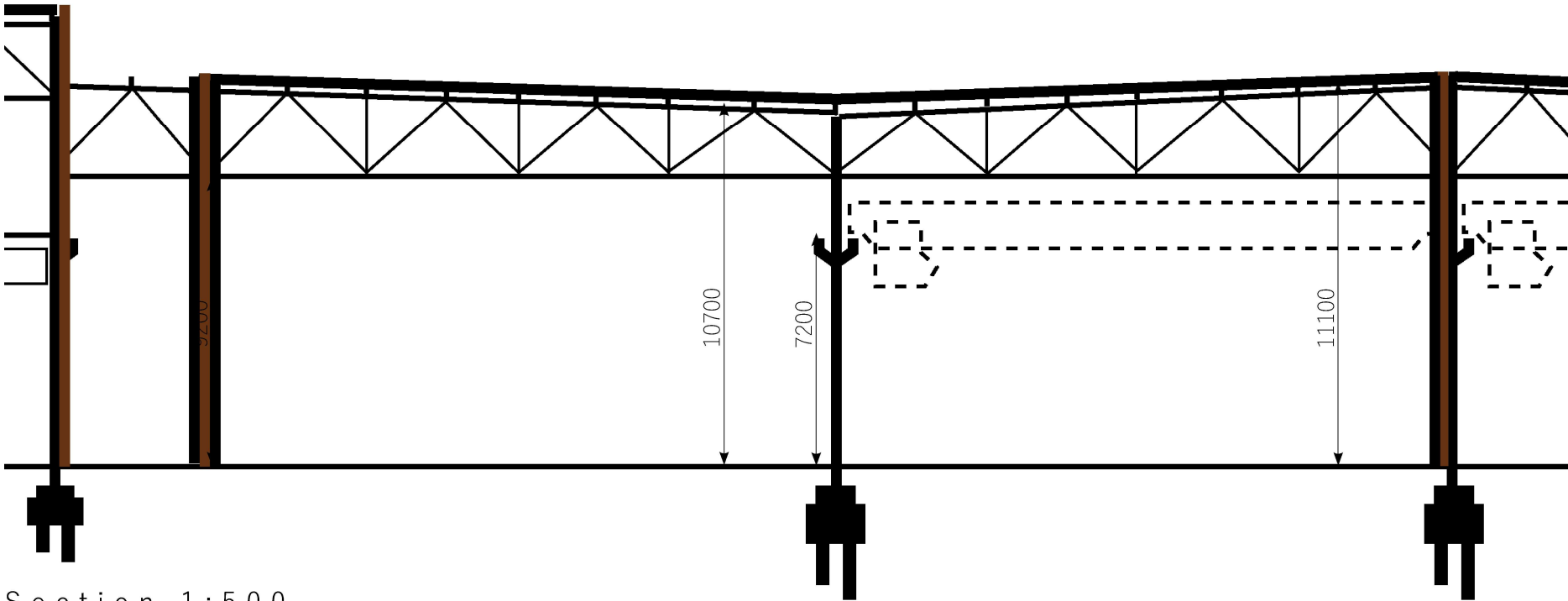




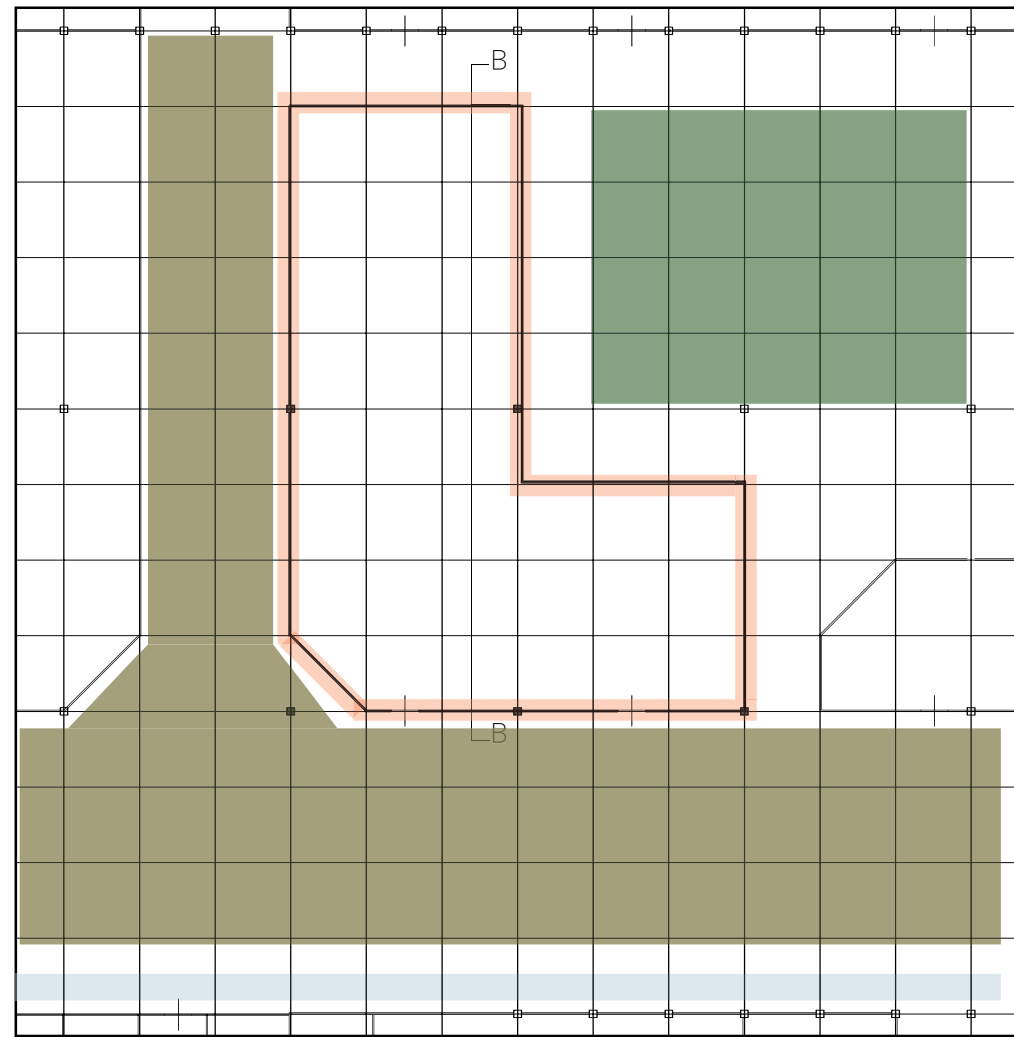
Floor plan 1:500



Axonometry



Section 1:500



Floor plan 1:500

## Skin

The existing walls which were situated inside the factory are not the part of the valued walls. The newly added skin for this volume, should be in line with the rest of the factory. The challenge lies in the difference between the courtyard side and the public street side.

Light

Since the distances of this block still can be changed, there is no problem with daylight.

Warmth/Cold

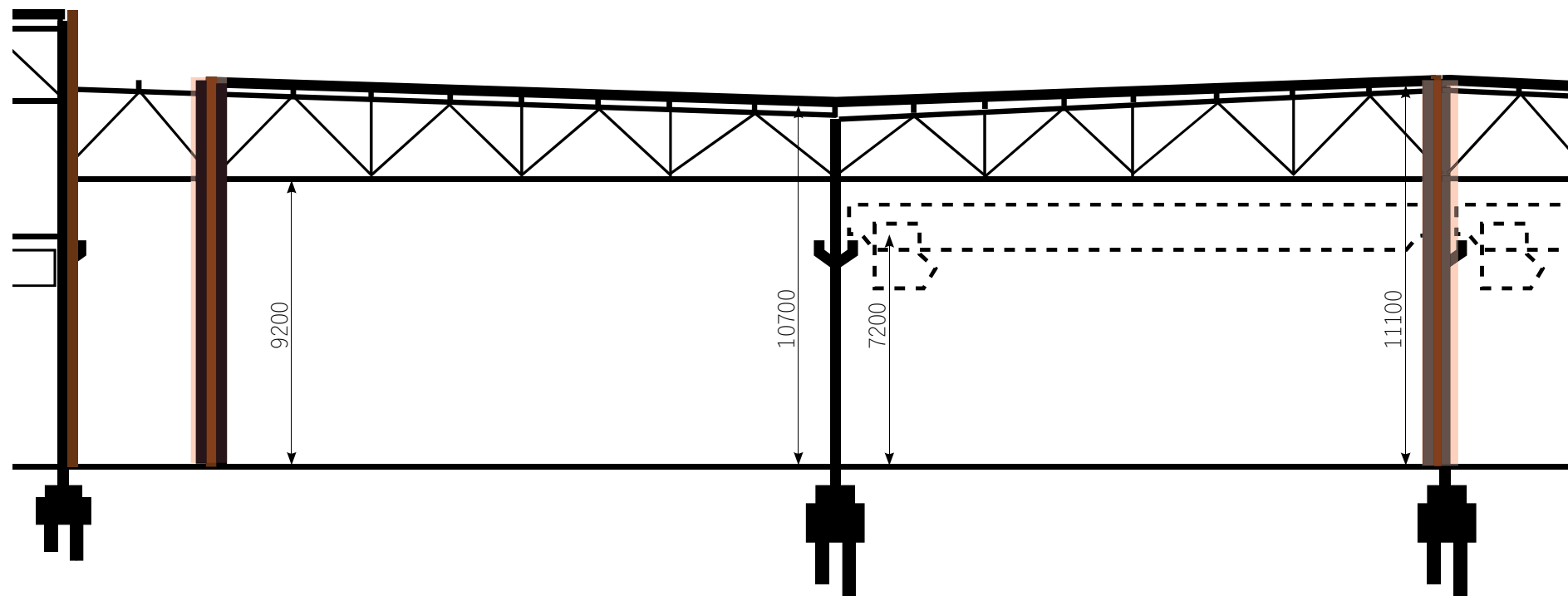
Since this block will be relatively new, insulation will not be an issue.

## Context

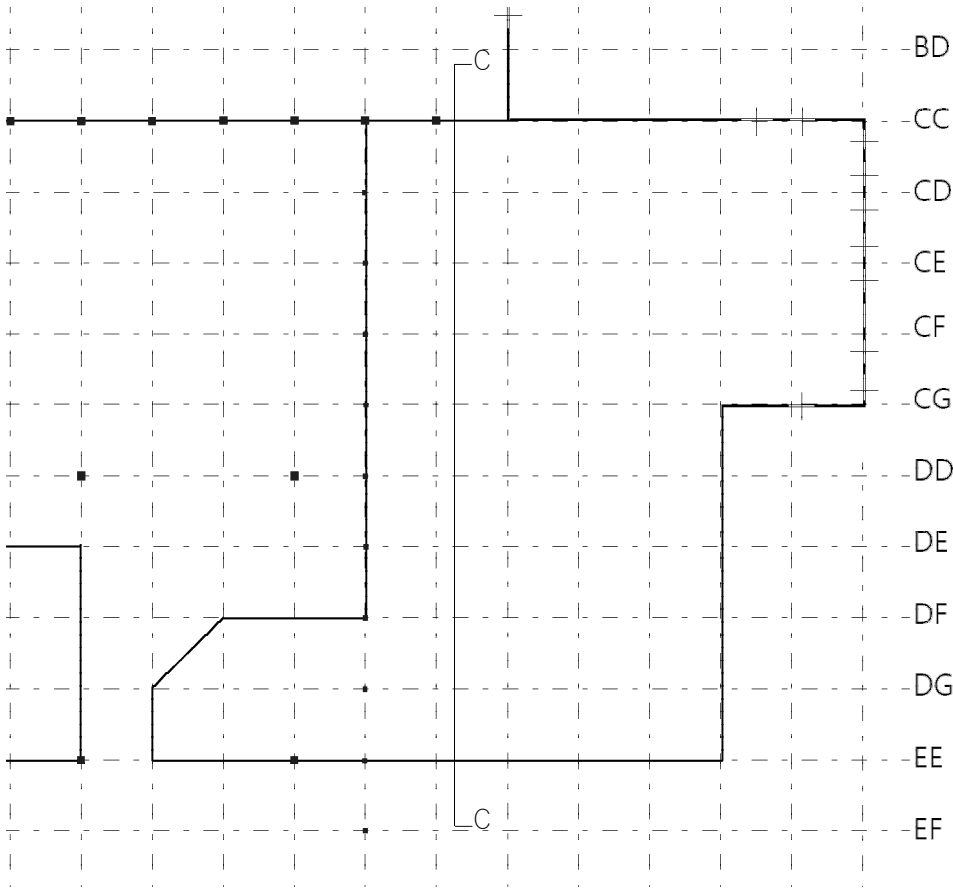
On the north east side a courtyard will be created. On the south west side the 'factory streets' are situated. These streets are only accessible by bike or on foot.

## Storey & structure

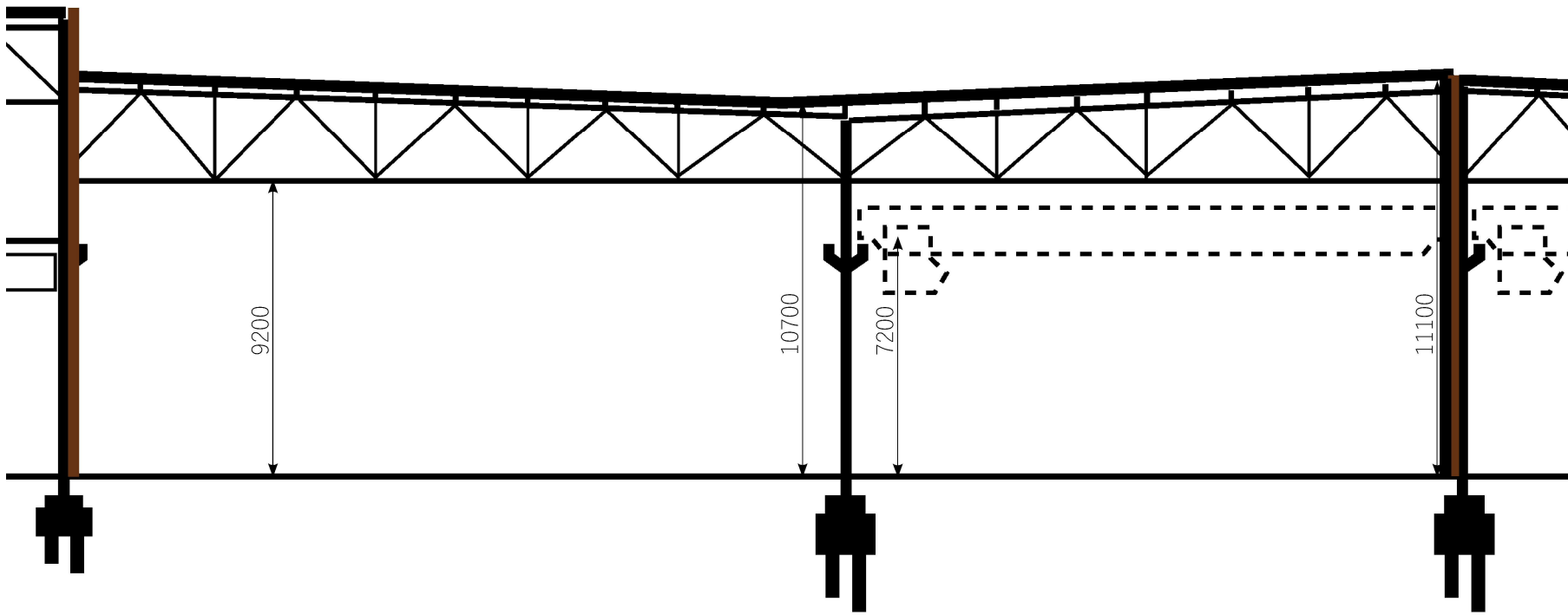
The height of this block can be used for extra storeys. The vision on preserving the structure is that the 'outside' structure is more important than the 'inside' structure. Therefore the question remains whether to demolish the structure inside this block in order to reuse or to preserve it and work with it?



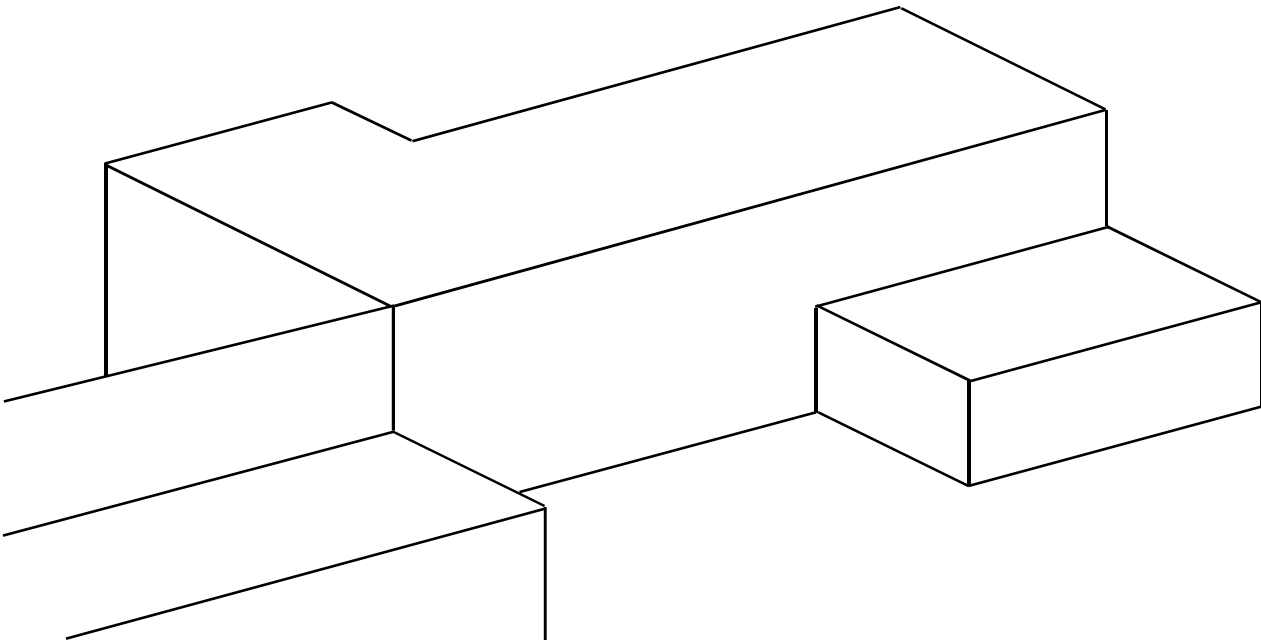
Section 1:500



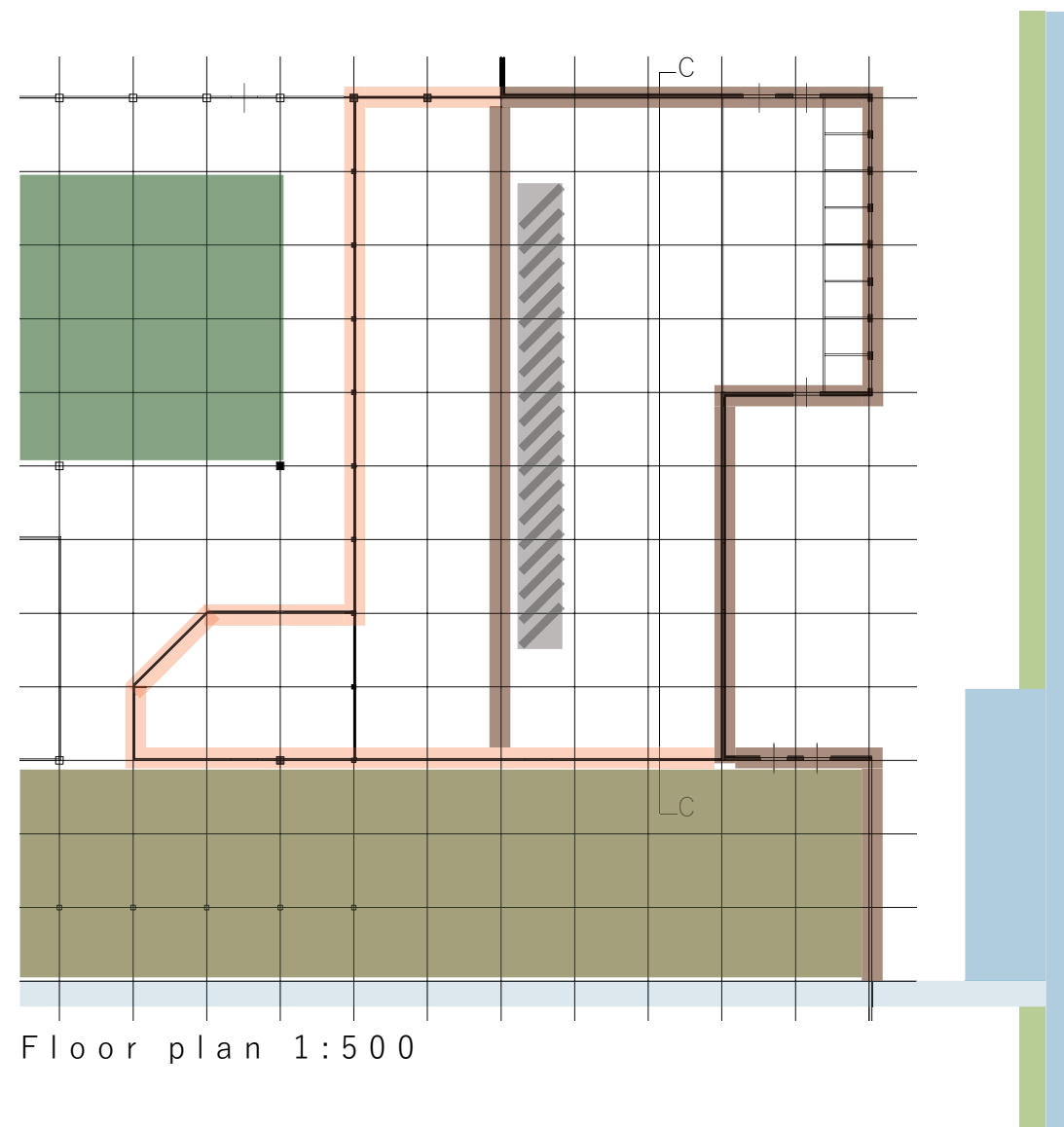
Floor plan 1:500



Section 1:500



Axonometry



#### Skin

The north and east façades are part of the existing skin of the factory. Furthermore, the north and east facade is adjacent to the public park. The newly built south facade to the 'factory streets'. Moreover, an existing brick facade is situated in the middle of this volume.

#### Light

The existing façades consist of large (around 20 m<sup>2</sup>) windows. However, the depth of the factory hall is 25 metres. This leads to a darker zone in the middle.

#### Warmth/Cold

During winter times the factory halls are cold, since they are not heated and insulated. During summer times the heat should be kept out of the factory.

#### Context

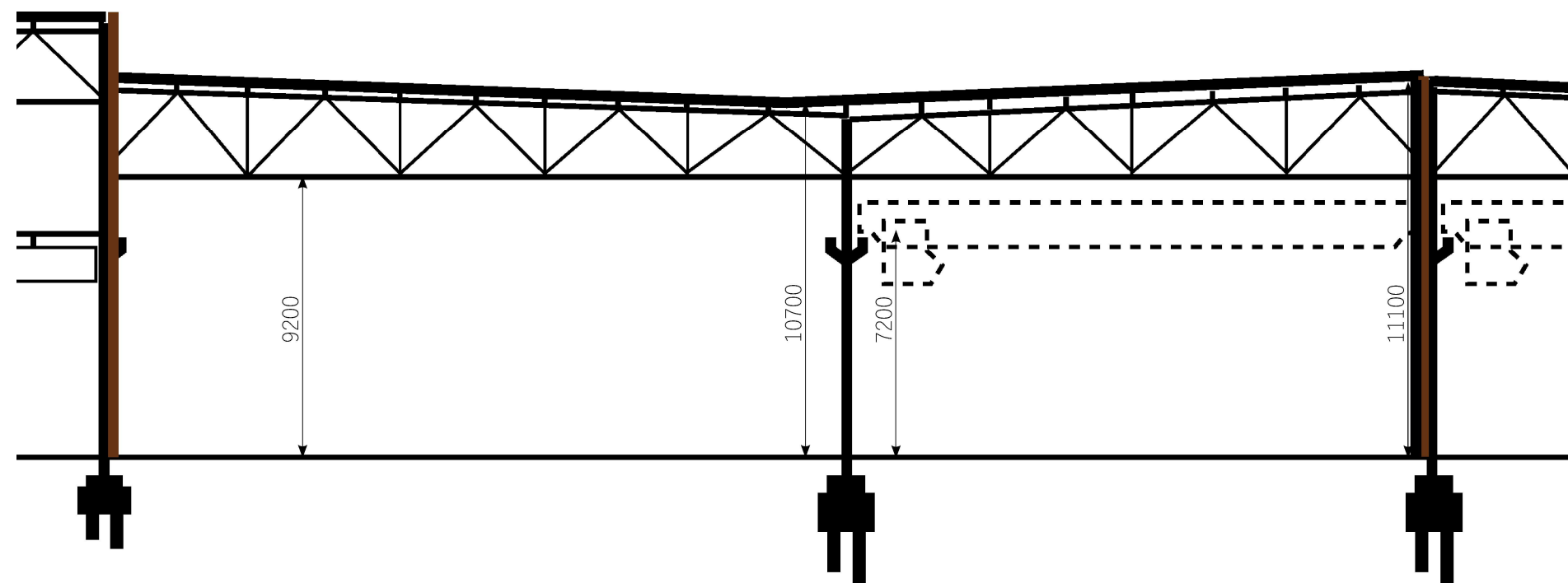
On the north side the former loading dock is situated, next to the green park and the canal Schie. On the west side, as mentioned above, a collective courtyard for the dwellers will be created. Lastly, on the south side one of the 'factory streets' is situated, which is only accessible by bike or on foot.

#### Storey

Extra storeys can be added because of the height of the factory halls, think of 'loft dwellings'.

#### Structure

The structure will give the new functions the industrial character. However, sound pollution and cold bridges are a critical point to pay attention to when designing.



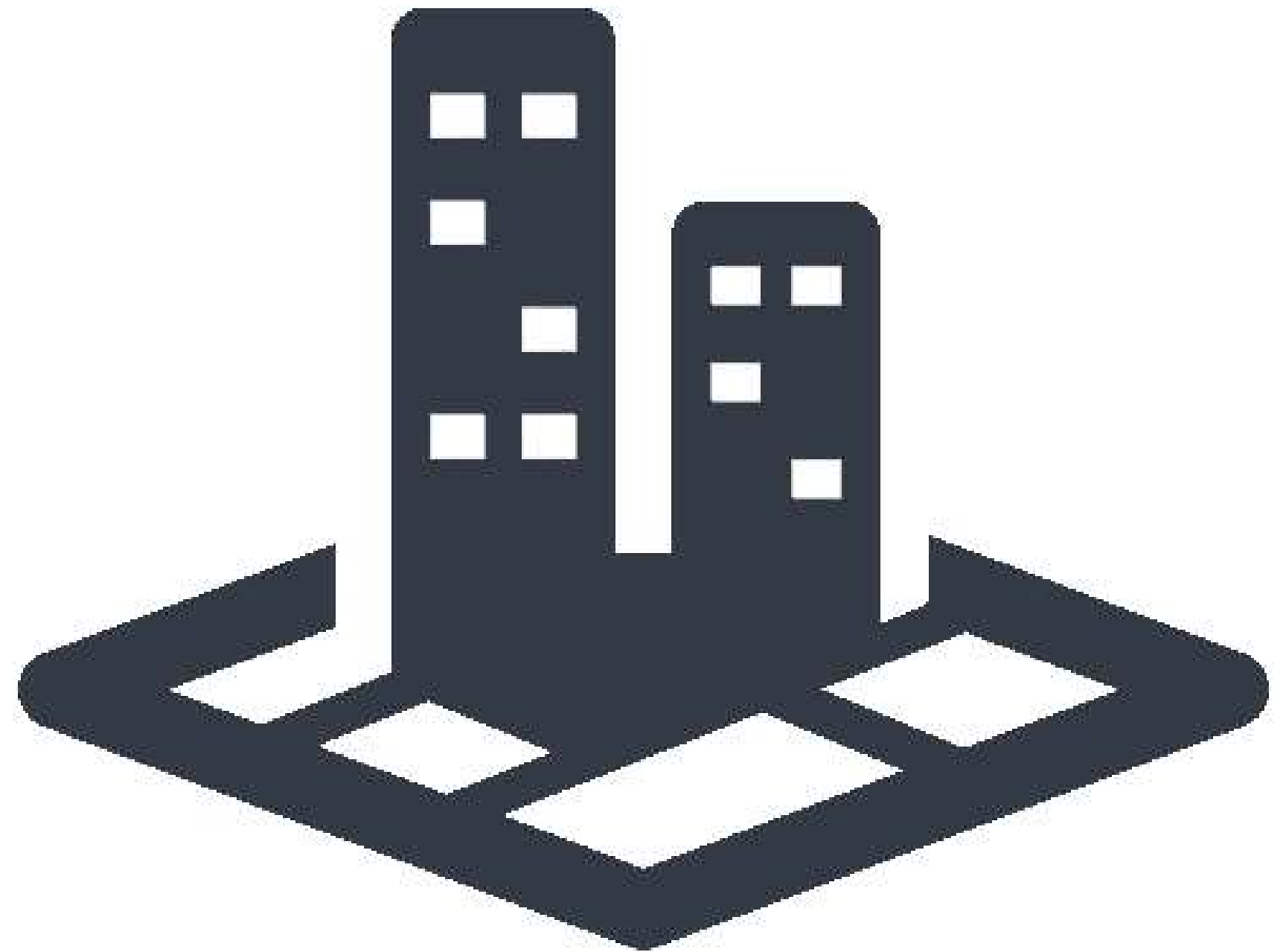
Section 1:500

3

URBAN PLAN

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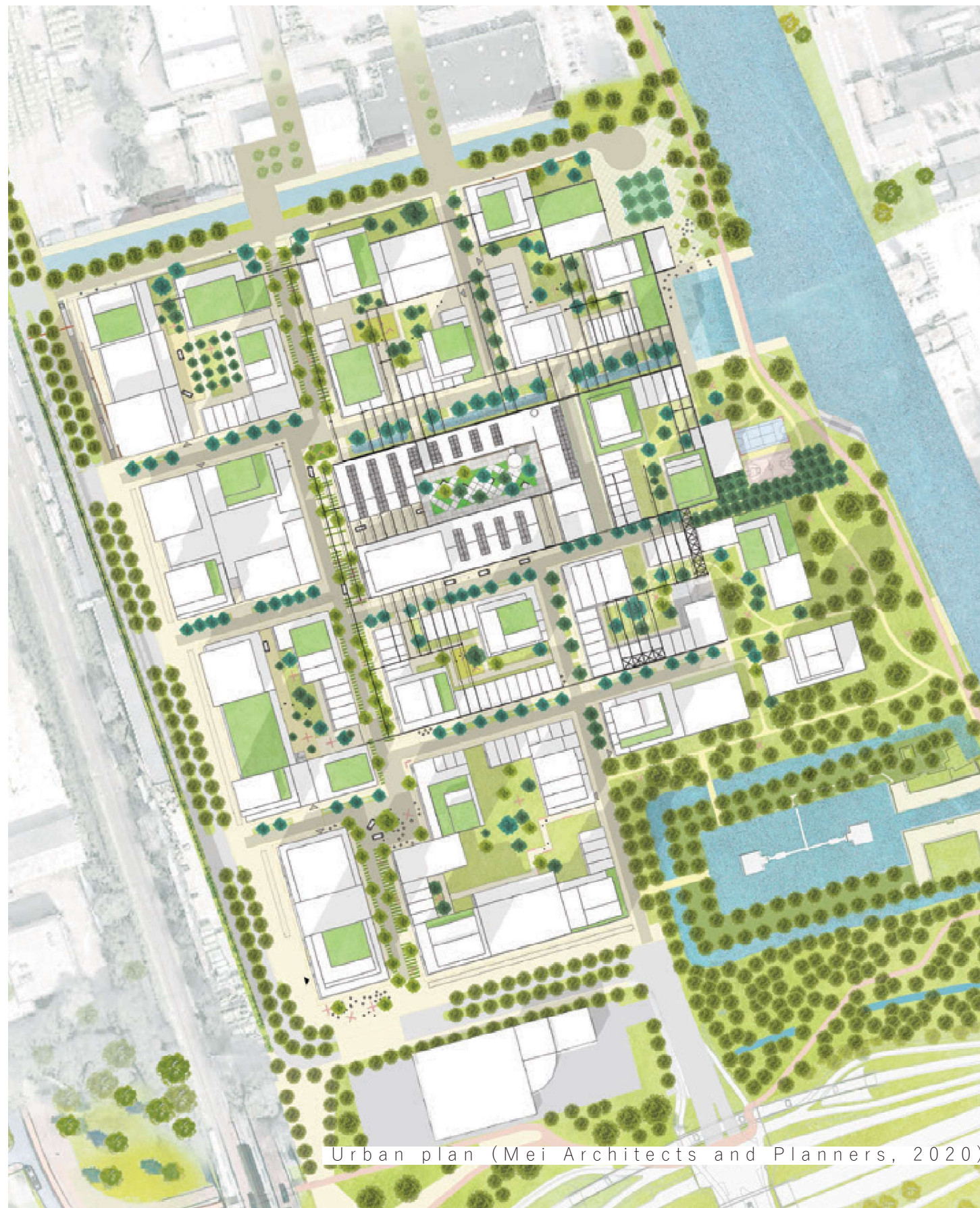
This chapter shows the starting points and design solutions for the new urban plan based on the urban plan of Mei Architects and Planners.





## BASIS LAYER OF MEI ARCHITECTS AND PLANNERS

The municipality of Delft already described its vision for Schieoevers Noord. It assigned the amount of dwellings and workspaces in the Kabeldistrict, 3.200 dwellings and 1.250 extra jobs. The urban plan of Mei Architects and Planners is used as the basis for the preliminary design, called Kabelfabriek 2.0.



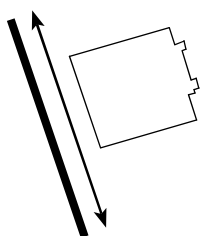
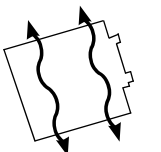
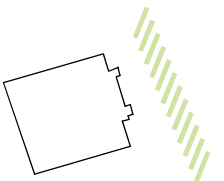
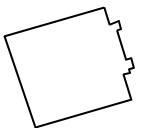
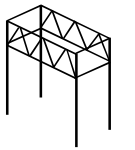
Urban plan (Mei Architects and Planners, 2020)

### + POSITIVE POINTS

- o Preservation of the structure
- o Preservation of the skin
- o Schieweg turning into a green park
- o Street pattern North - South
- o Schieweg moved to the West side of the Kabelfabriek II

### - POINTS TO IMPROVE

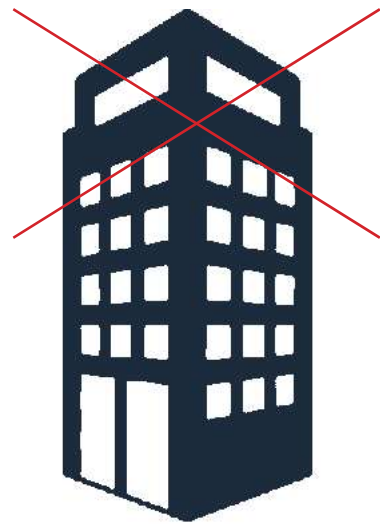
- o Visible length of the Kabelfabriek II
- o Positioning of the high rise, Kabelfabriek II patio "pit" not tangible/visible
- o Too much high rise and too high



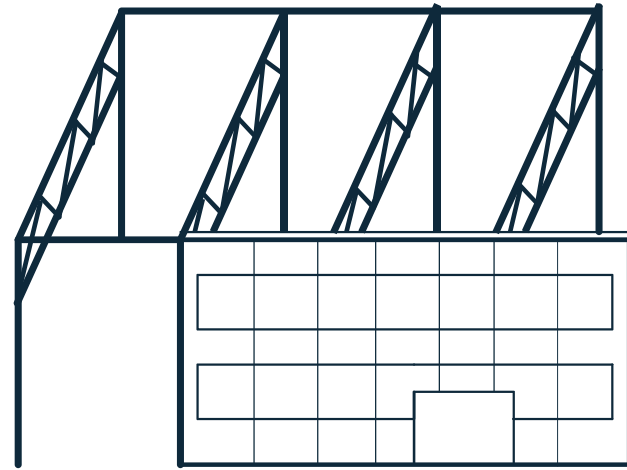


## STAKEHOLDERS INVOLVEMENT

As a result of the research, see research booklet chapter 04 Digital Heritage and Co-creation page 50, the needs, wishes and values of the stakeholders were indicated. The following four images conclude this.

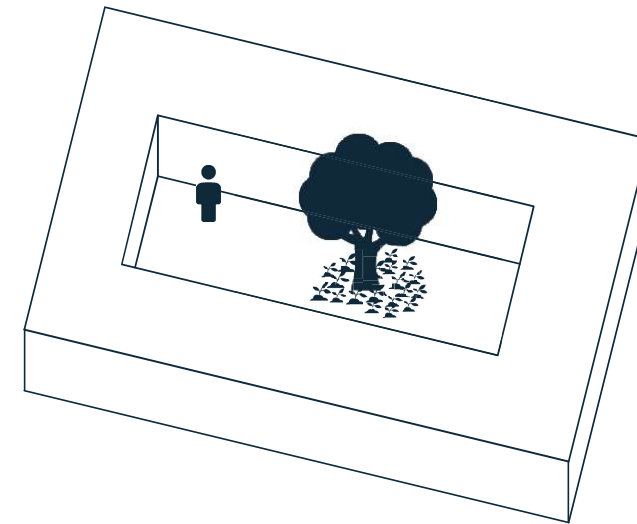


**Less high rise**



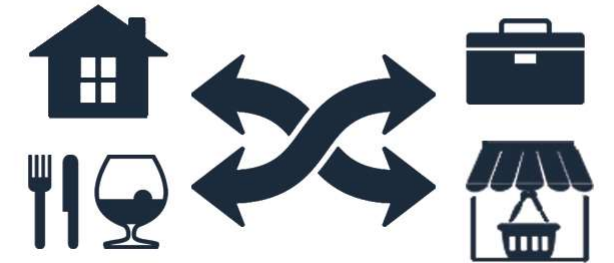
**Preserve the construction and skin**

The length and height of the skin should be preserved, as well as the orientation of the factory towards the canal Schie.



**More patios with human scale and green**

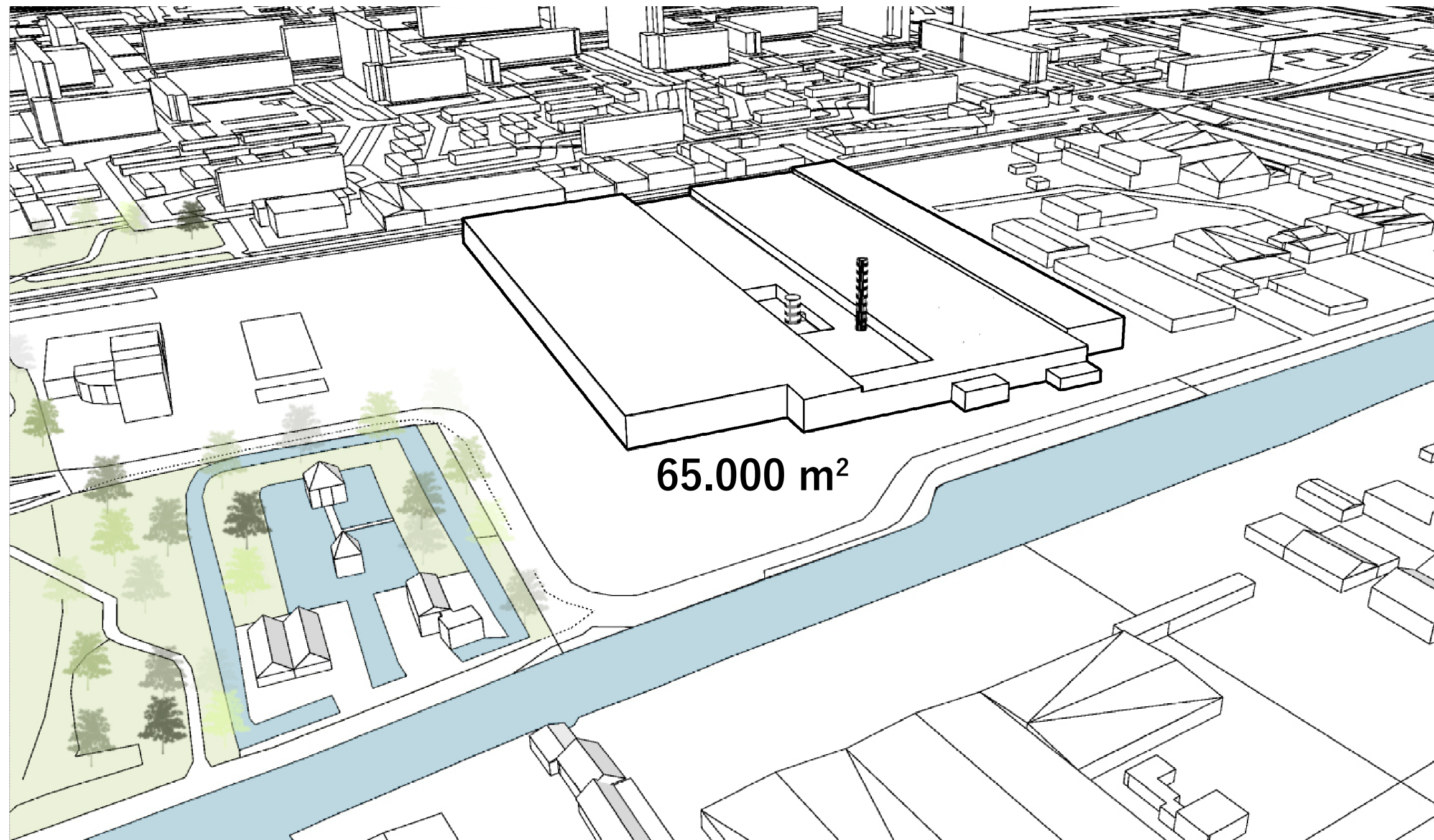
More patios should be added in order to feel the human scale in the factory, as in the original patio. Furthermore, the green of Schiepark should be taken into the factory.



**A mixed use**

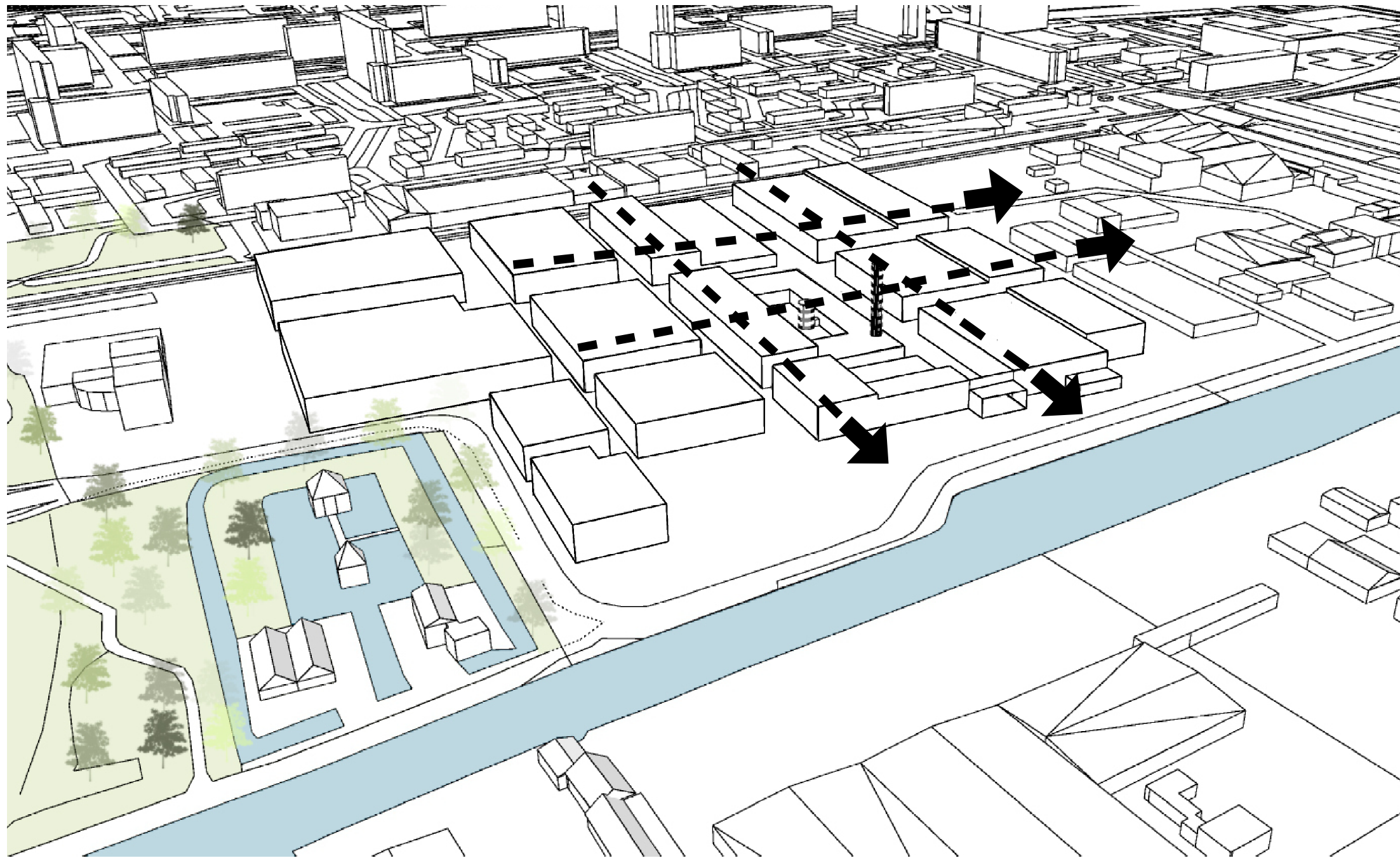
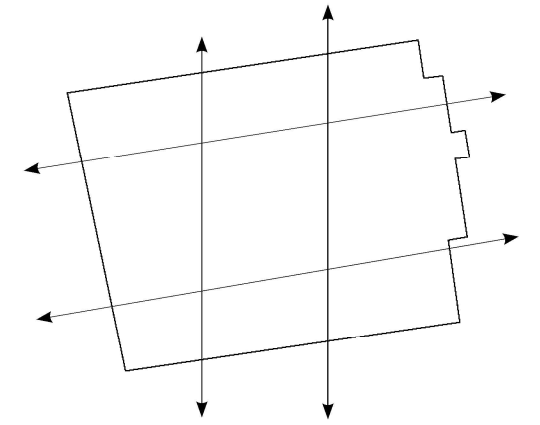
A mixed use in the whole factory: working, living, shops, horeca facilities.





## STREET PATTERN WITH VISIBLE SIGHTLINES

In order to create visible length, the internal streets are extended all the way from north to south and east to west.



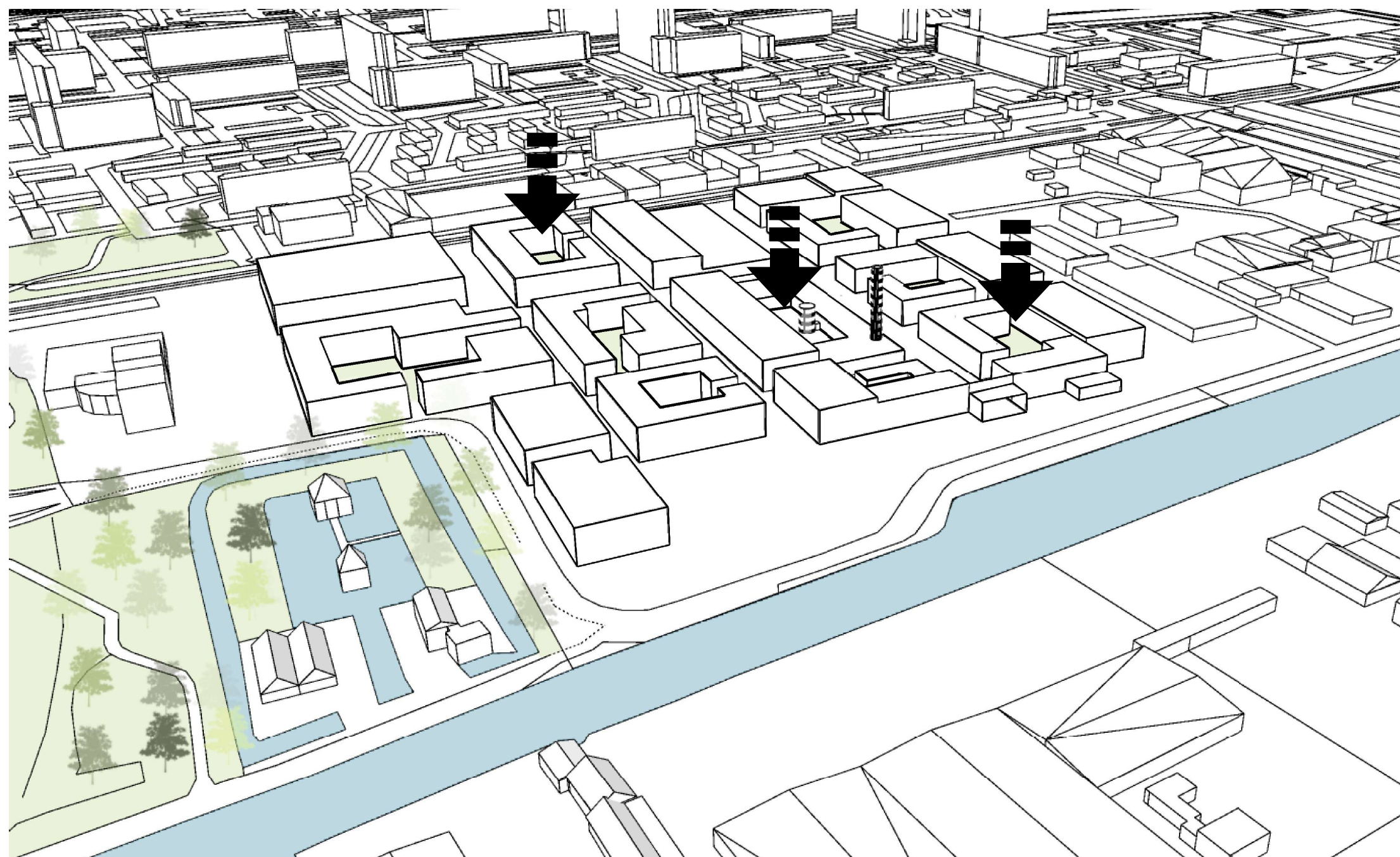
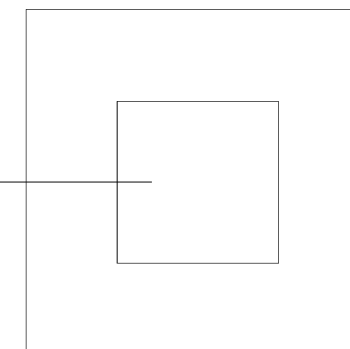


## PATIOS AND URBAN BLOCK

The new urban plan and urban blocks are based on the existing floor plan of the factory, namely the patio. It is an unexpected open space in the factory. The new urban blocks consist of their own collective, semi-public patios, which is comparable to the traditional closed urban blocks in Dutch cities.

Semi-public

Public



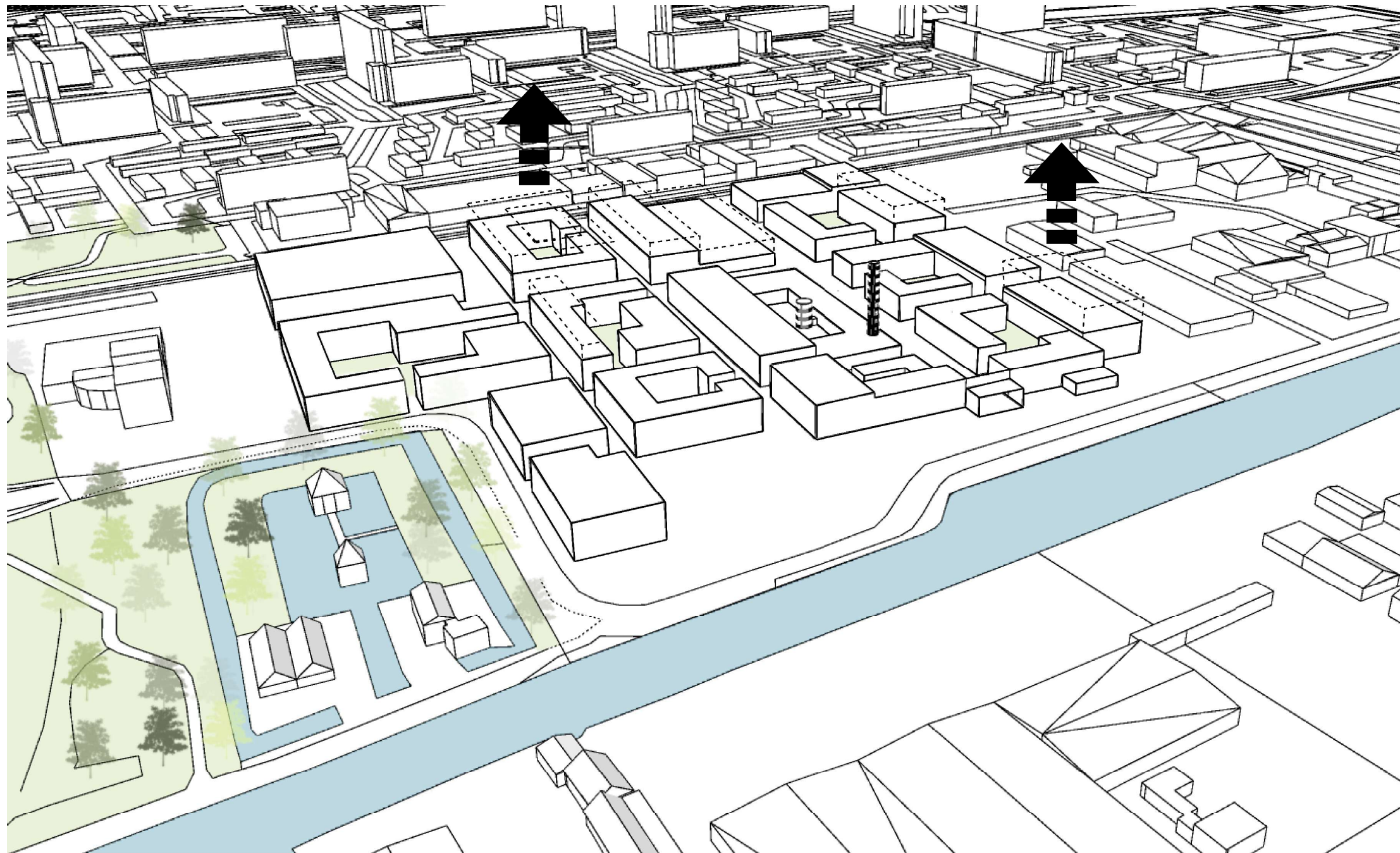
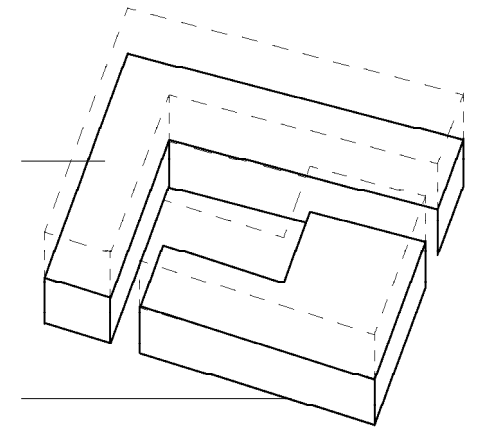


## LIVING VERSUS 'ACTIVE' PLINTH

The plinth provides for activity during daytime, whilst the floors above the plinth are designated for living.

Living

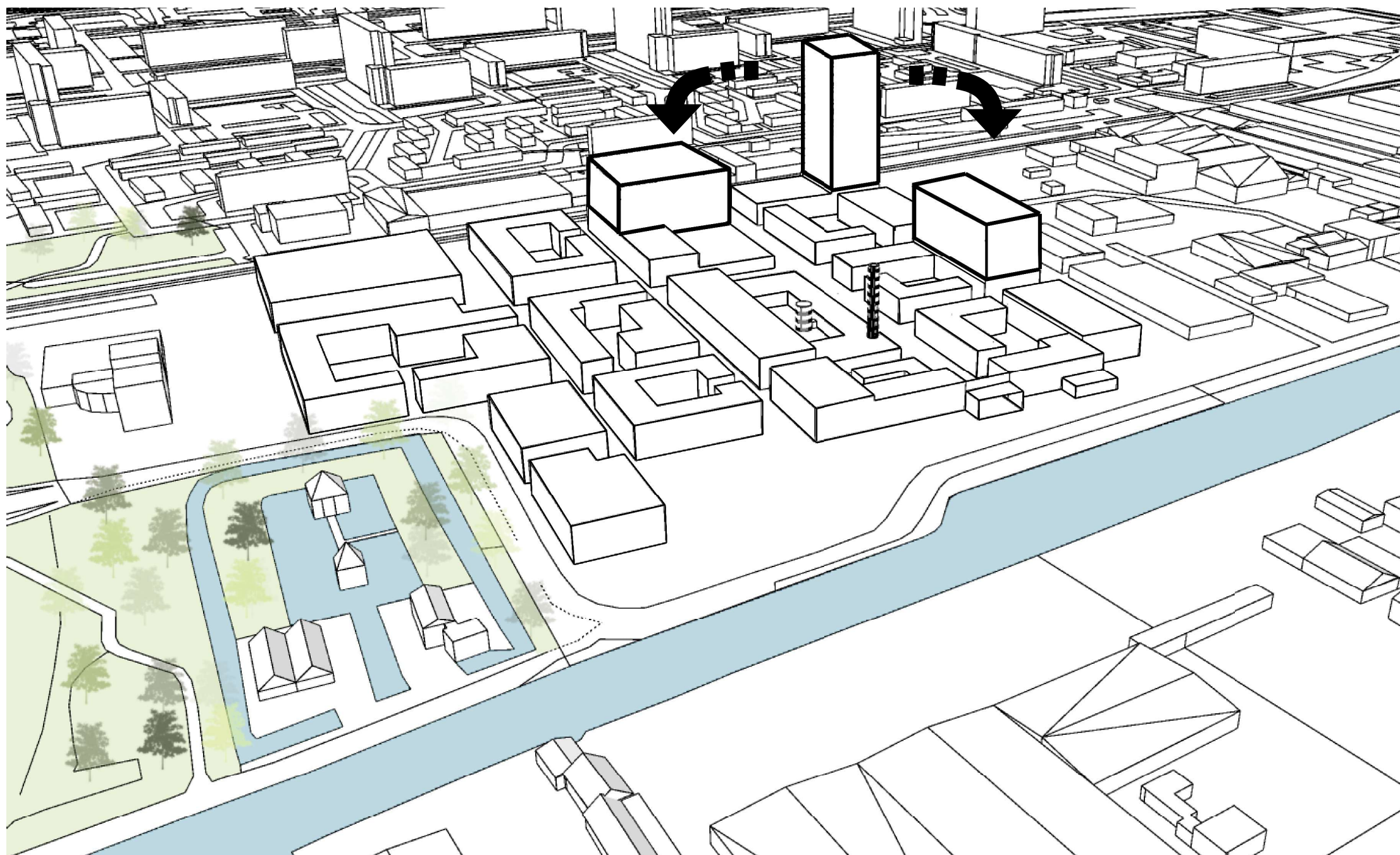
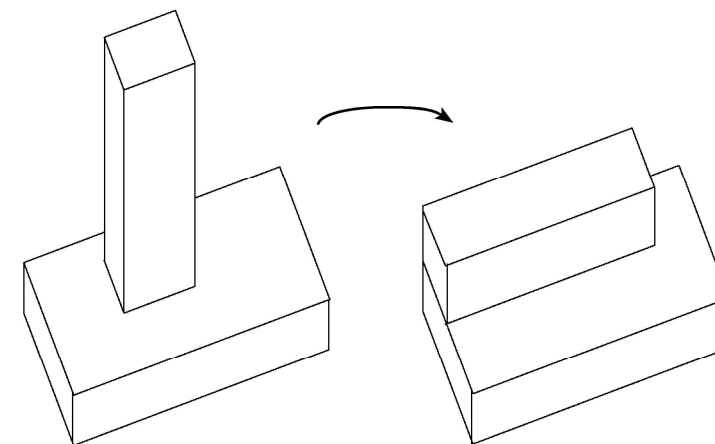
Public/'active' plinth





## LESS HIGH RISE

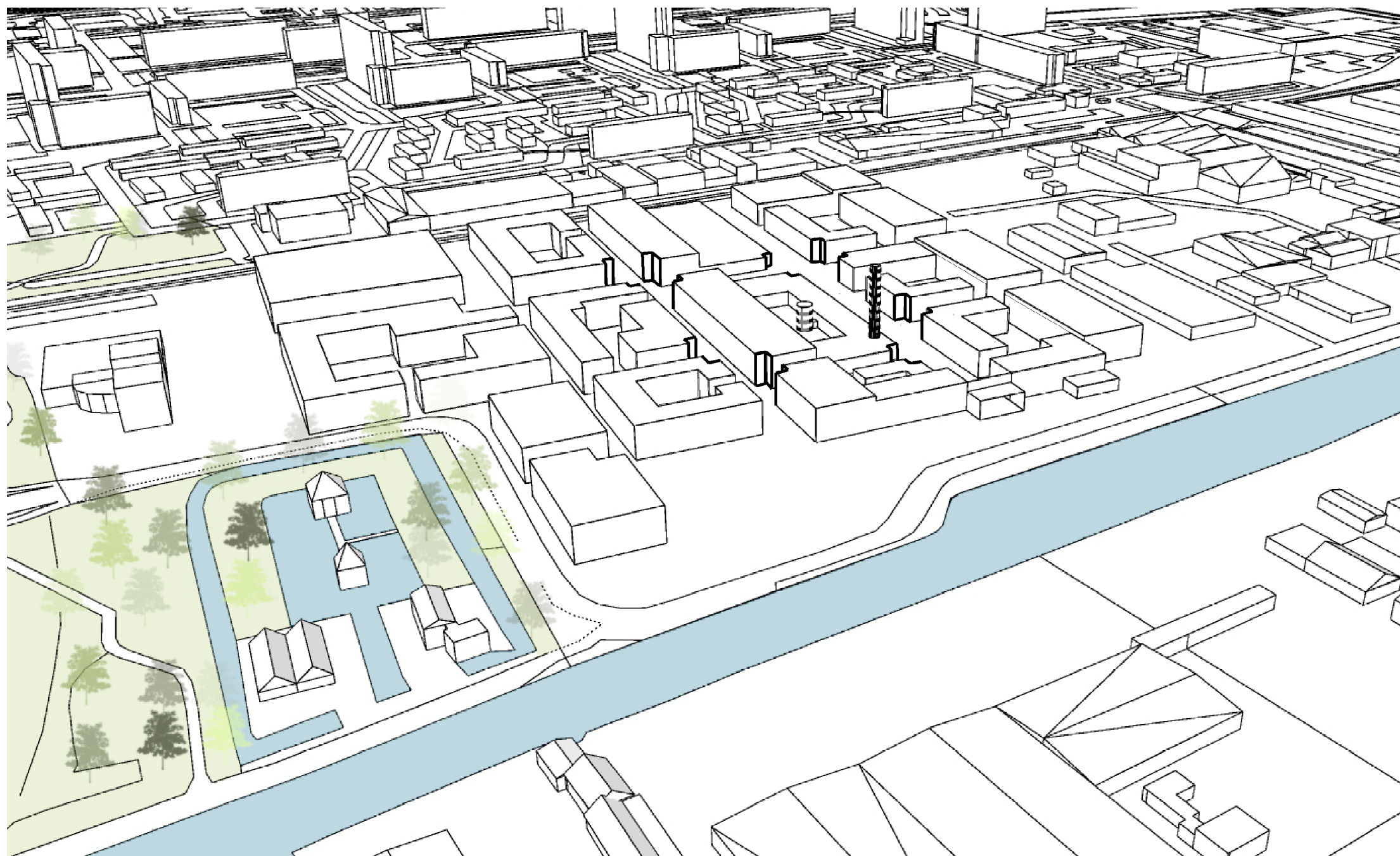
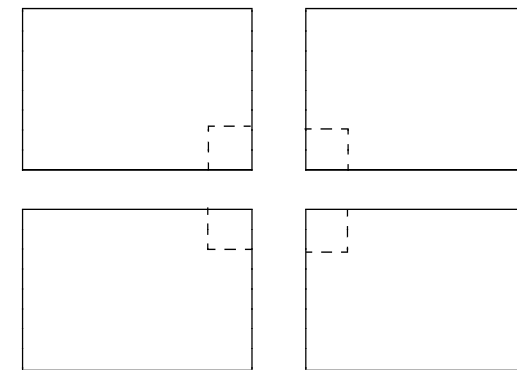
As mentioned before, the stakeholders are not in favour of high rise as it is out of place looking at the present Delft skyline. The solution for this, is to flip the high rise to medium rise and create a hierarchy from high to low in order to keep the east façade 'free'.





## CREATING OPENNESS, SQUARES, LIGHT AND AIR

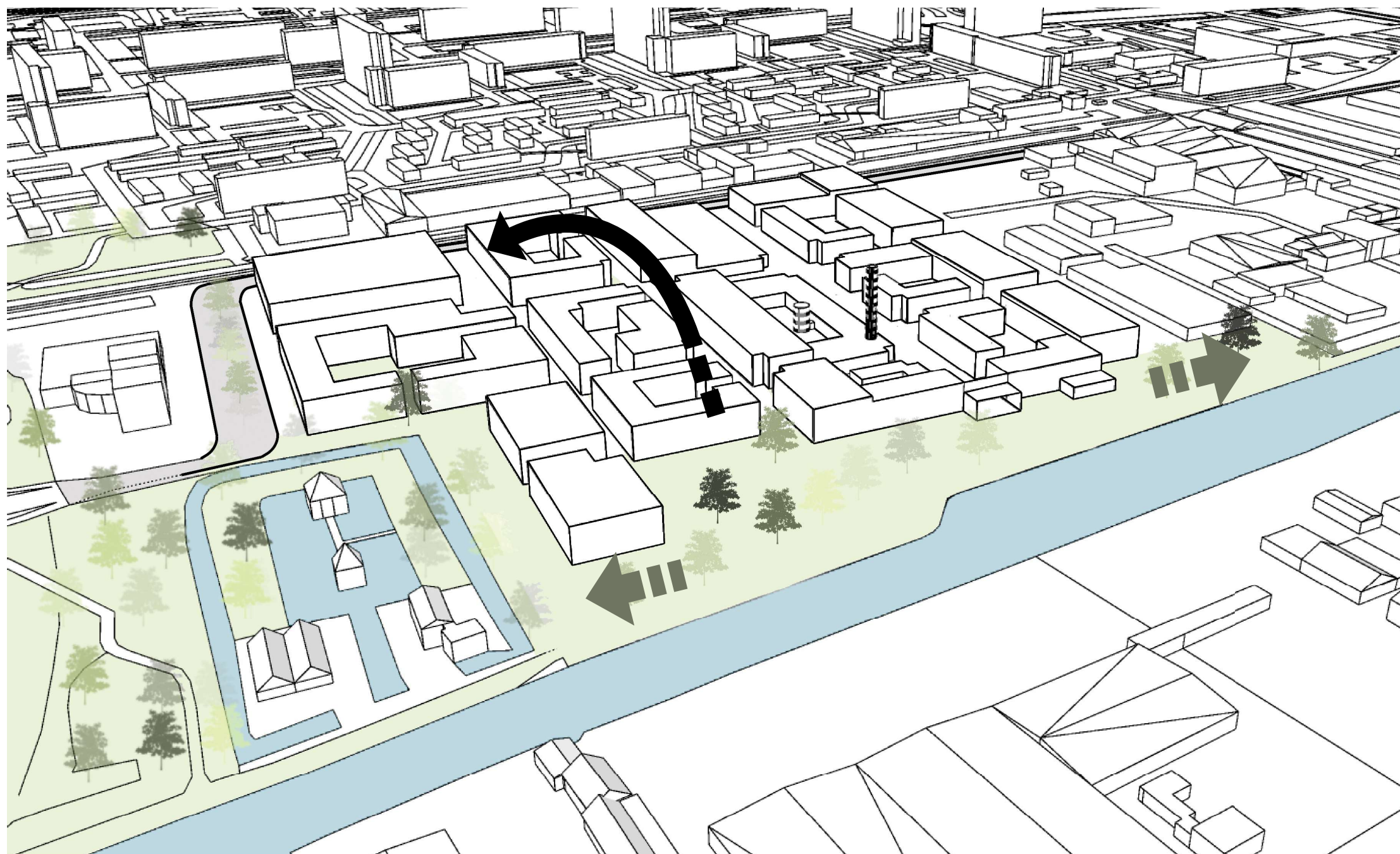
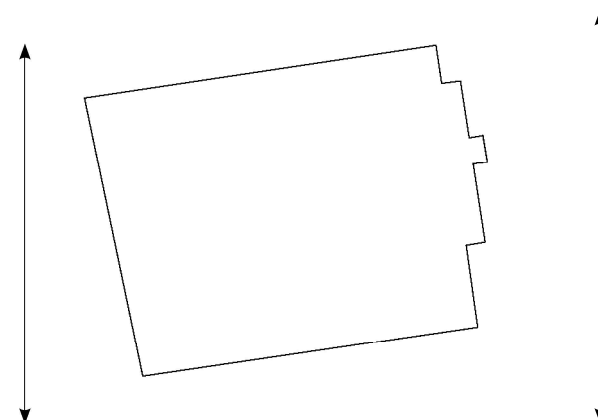
The corners are cut off to create openness, squares, light and air.





## SCHIEPARK AND SCHIEWEG

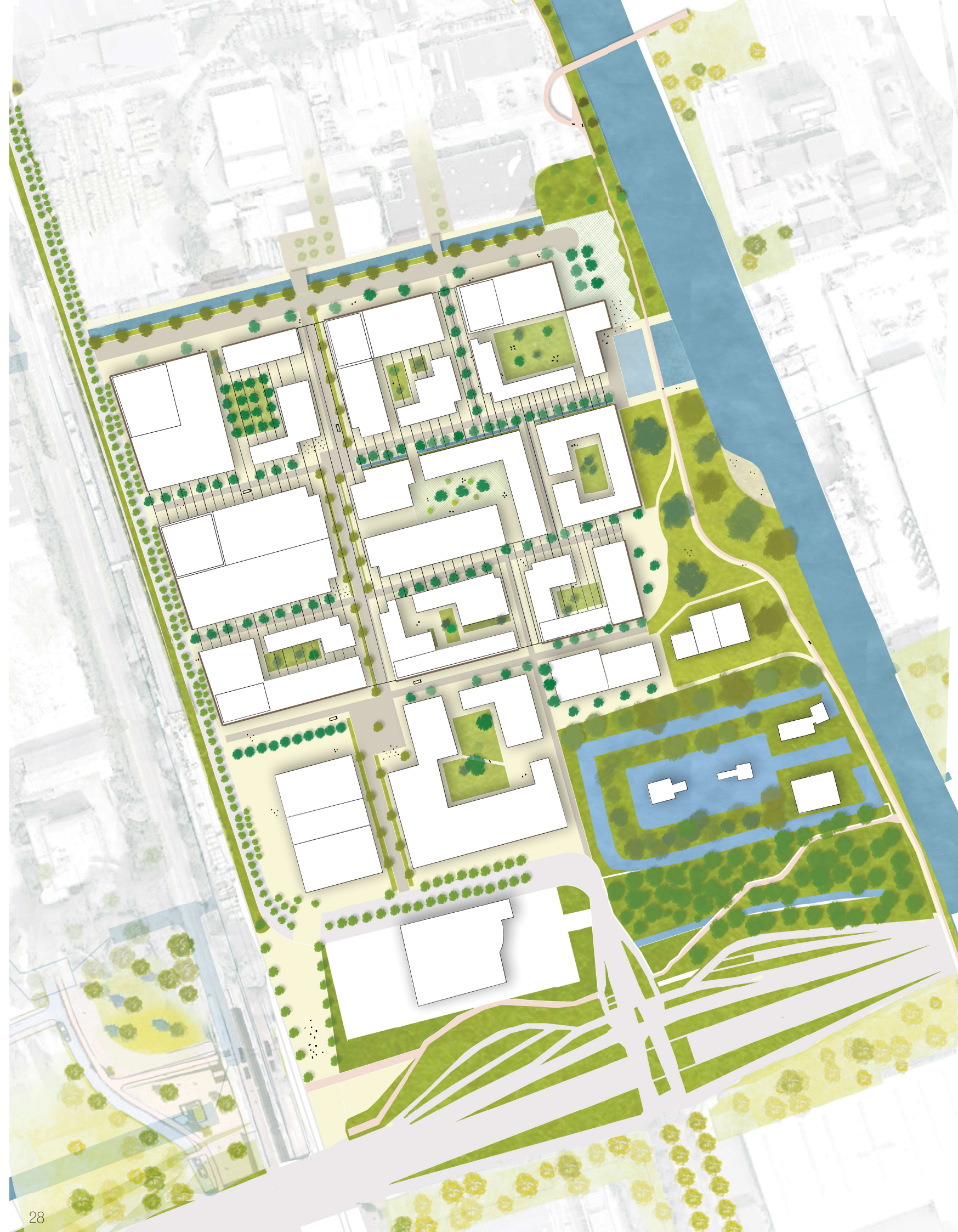
The last design solution: turn the Schieweg into a green park and move Schieweg to the West side of the Kabelfabriek II, similar to the urban plan of Mei Architects and Planners.





## URBAN PLAN

This all results in the following urban plan, with its sight lines, internal streets, patios, active plinth, squares for daylight and air, the Schieweg and the new Schiepark.



4

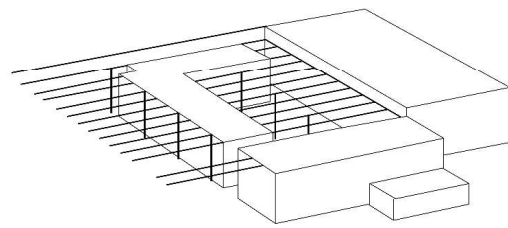
URBAN BLOCK

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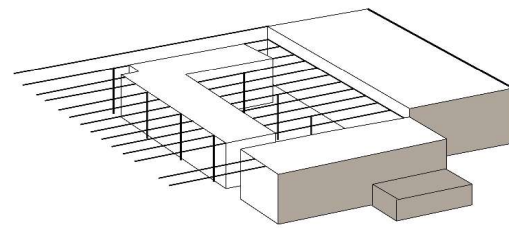
This chapter shows the relations within the urban block. The urban block consists of three volumes with the outdoor space, which is part of the north east corner of the urban plan. Because of its sheer size, only a part of the factory will be focussed on. The north east corner is chosen, because it consists of new and old parts and all the elements of the design solutions mentioned earlier in chapter three 'Urban plan'.



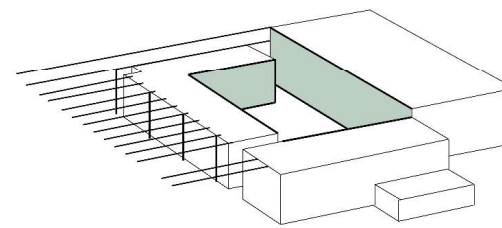




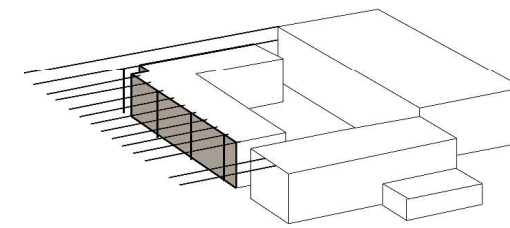
**Starting situation in new urban plan**  
form follows existing.



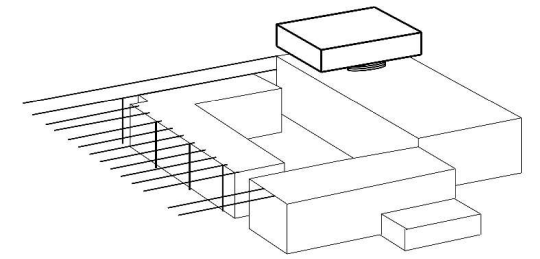
**Preservation of the skin**  
Adaptations to the façades will maintain the same rhythm.



**Preservation of the construction**  
The construction is preserved in the public factory streets and factory halls. A new patio is created whilst the existing construction is removed.



**Fusion**  
The new façades speak the same language of the existing façades. The new volumes blend in the existing architecture.



**Metaphor & reference**  
The newly added topping is a metaphor to the large number of cable spools present. The upper part refers to the valued construction. The lower part refers to the cables of the cable spools.



## PROGRAM

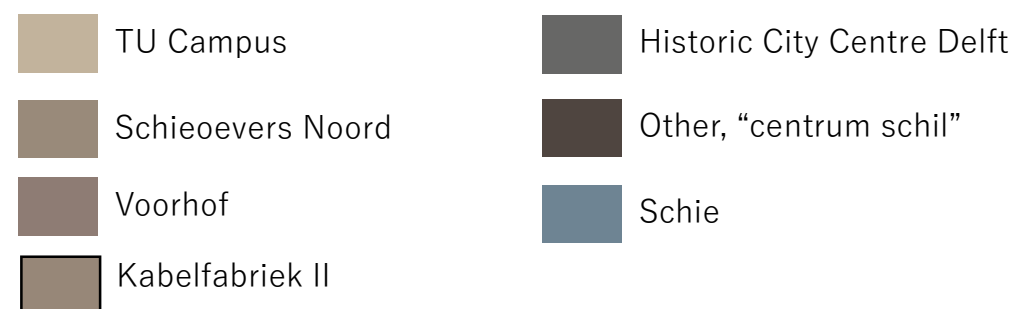
Researchers of the Faculty of Architecture and the Built Environment at Technical University Delft created the 1M Homes Initiative, stating the following problem concerning the present housing shortage:

“There is an urgent need for affordable housing solutions in the Netherlands before 2030. However, the focus should not only be on producing new dwellings, but rather on creating homes and neighbourhoods that meet the needs of the future population. In urban regions, housing production lags behind and real estate prices are growing, resulting in a shortage of affordable homes, especially for starters. Moreover, changes in the housing provision have led to a lack of affordable homes in non-urban regions as well.” (TU Delft, n.d.)

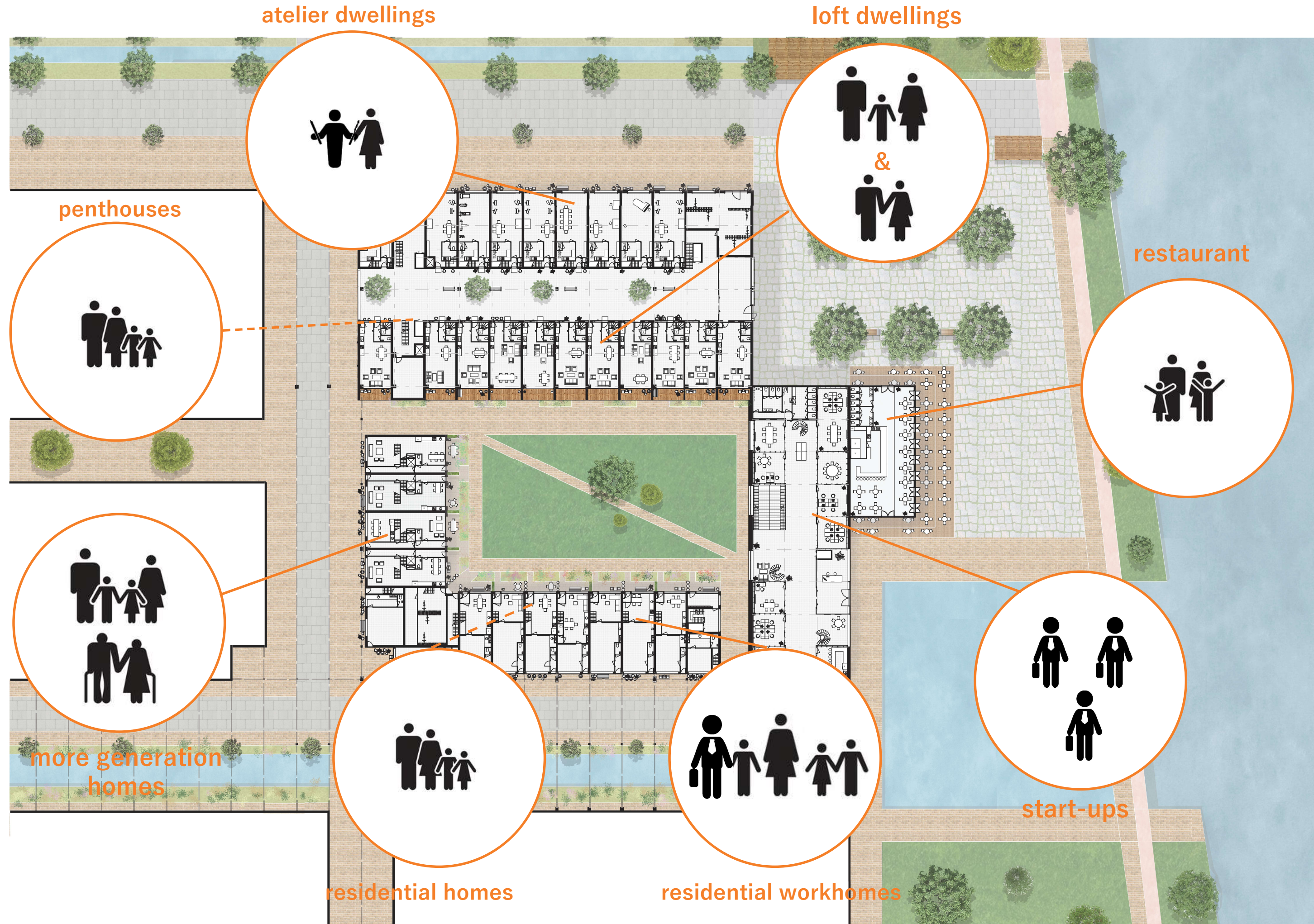
The Kabelfabriek II is used as a case study to answer the main research question (How can a co-creation approach be applied for redesigning 20th century Industrial Heritage factories for adaptive reuse together with stakeholders?). The research booklet illustrates how the co-creation approach can be applied for adaptive reuse for the Kabelfabriek II. This factory can be seen as a typical example of 20<sup>th</sup> century industrial heritage factories considering its sheer size, its materials, its construction and location at the former city limits. The municipality of Delft has drawn up a development plan in which it states that a total of 3.200 dwellings and 1.250 extra jobs are to be created. This clearly influences the scope of the project as it limits the architectural freedom. For example one may wonder if the requirement for creating this number of dwellings and jobs matches the industrial and historical character of the factory. It complicates the design assignment at the expense of the preservation of the industrial heritage.

However, other functions could fit the factory better, with less adaptation (e.g. an event hall or museum), the Kabelfabriek II and its surrounding, Schieoevers Noord, is the perfect place for densification to meet the urgent need for affordable housing. The city of Delft aims to build 15.000 new dwellings before 2040. Taco Postma, city architect (“stadsbouwmeester”) in Delft since 2019, agrees, in the interview with Elsinga and Mooij (2020), that Schieoevers Noord is the perfect place. He stated that it ‘is extra compelling when you realise that Delft has reached the outer limits of its municipal grounds, so any new developments need to be implemented within the existing built fabric.’

Therefore the new urban block will consist of different types of housing (e.g. family housing, residential work homes, ‘multi generational homes’/‘intergenerational homes’) and horeca and working facilities next to the green park to create a living square, see next page. These functions were also retrieved from the stakeholders involvement research.



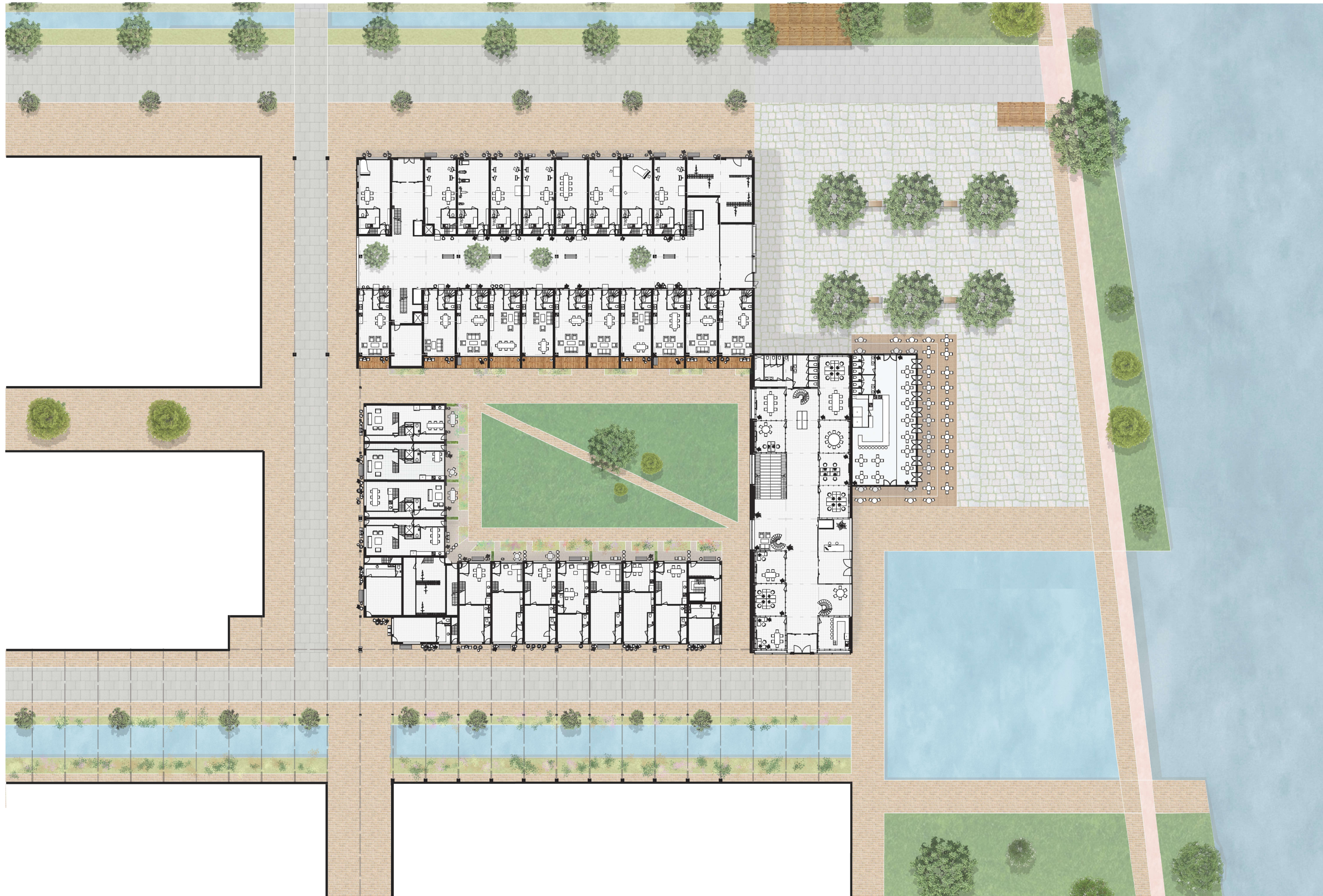






## PLAN URBAN BLOCK

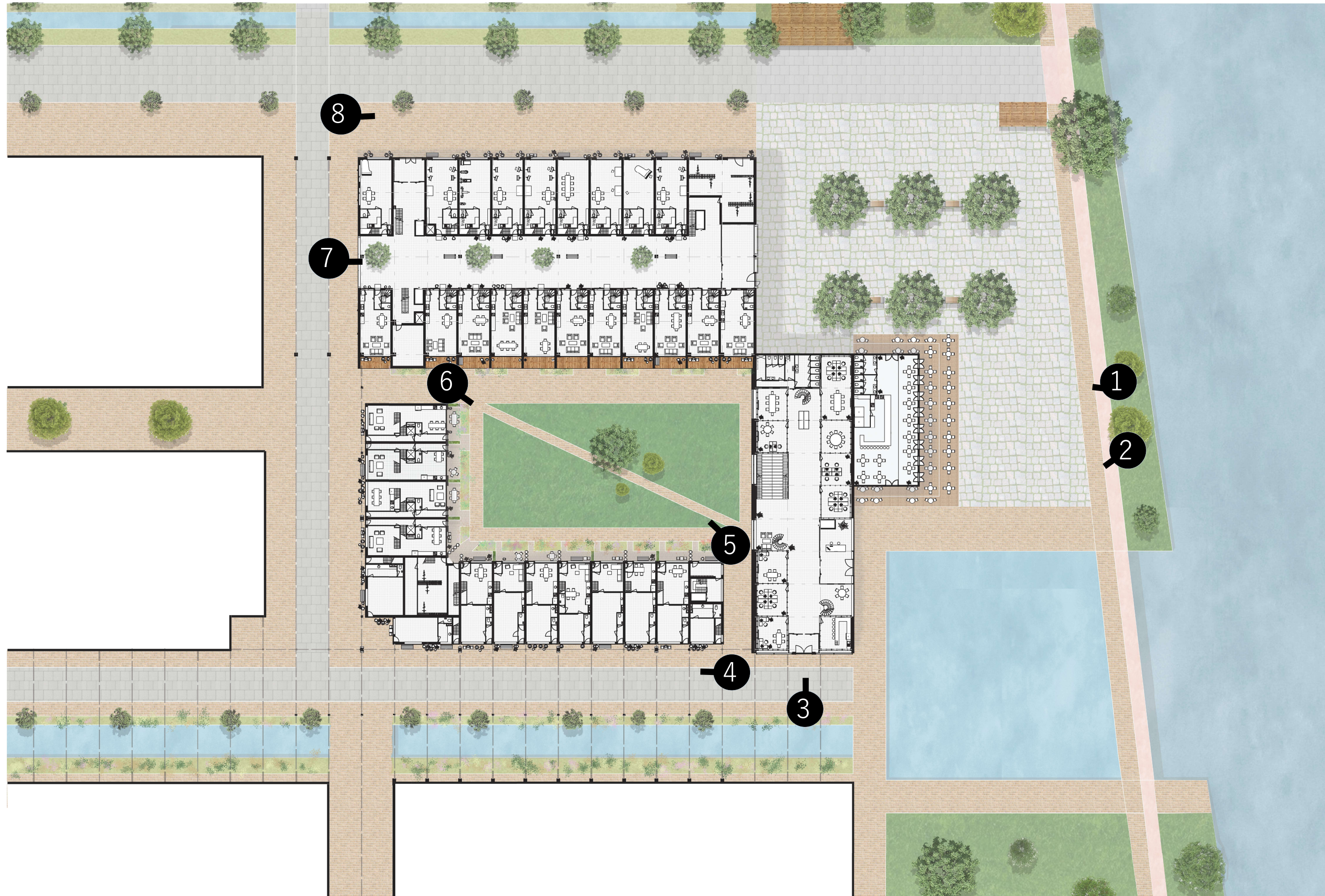
This drawing shows the new plan of the whole urban block at ground floor level.



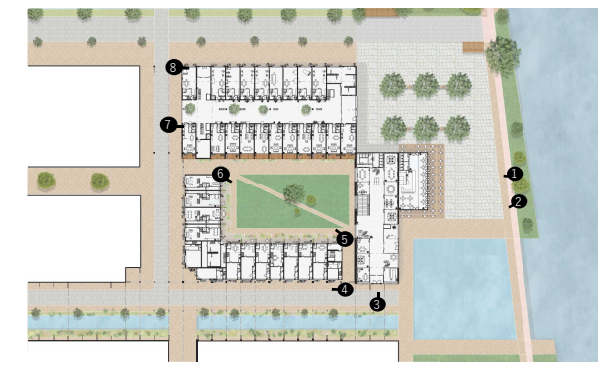


## OUTDOOR SPACE

On the next pages the visuals of the outdoor spaces with its sight lines will be shown according to the location numbers in the figure below.







This drawing shows the preservation of the existing front facade of the factory. The truck loading docks are replaced by large windows and a large pivot door. Both windows and door have a thick frame as a reference to the loading docks and to emphasise the entrance of the hall. In this way a sight line is created through the hall from the Schie into the factory.

A restaurant is situated in the old “transformer space” creating an active square next to the three small green parks with plants and flowers inspired by the gardens of Piet Oudolf, who creates gardens that are beautiful in every season.

The existing blue double doors on the outside of the restaurant are maintained, whilst new glass doors are placed on the inside of the restaurant wall.

On the left of the restaurant the entrance of the flexible start up spaces can be found.

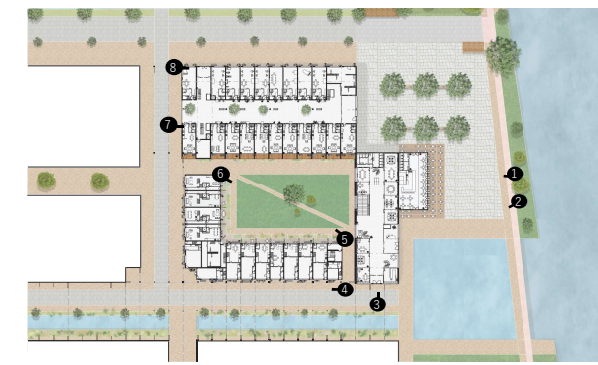
On the top right in the back the new topping is shown, as a reference to the construction and cable spools.



This drawing again shows the preservation of the existing front facade of the factory and the green park with its water square.

At the existing indoor factory street an opening has been made to create an outdoor factory street.





This drawing shows the new curtain wall, placed to create a sight line through the old factory with its construction and brick façades. The concept of block number three is to build dismantlable working units for starters to create a flexible space, where it is easy to attach or to detach new units where needed in the future. The concept is a mix of 'the new makers' who have created a system to build these units. The material wood, used by Respace, is chosen because it is dismantlable, it has a different look than the steel construction and because of acoustics and humidity reasons.



This drawing shows the outdoor factory street which used to be an indoor factory street. The facade speaks the same language as the existing façades of the factory, since it is placed inside the factory urban plan and as the factory plinth. The same language can be seen in: the brick material used, the horizontal windows without an outer sill, the rhythm and the thin window profiles. In this way the new blends in with the old.

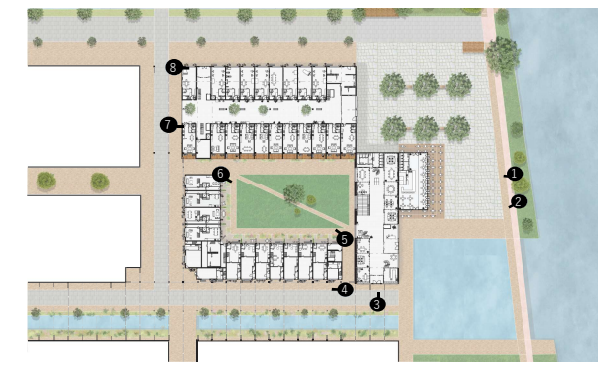
The new volume is placed underneath the existing steel construction in order to preserve the industrial character of the factory.

However to create recognition of the own front door and dwelling and to create a more personal space, the brick façades differ from colour and the width of the windows differ in size. This drawing also shows the transition zone from the public factory street to the private workspaces of the residential work homes at the plinth of the facade.



## VISUALS

This drawing shows the new plan of the whole urban block at ground floor level.



These visuals show the public courtyard, where as was visible on the urban plan, the construction is removed to create a new unexpected space inside the factory. At the same time this greenery is used for collecting rainwater. The concept of this unexpected space is in line with the outcome of the stakeholders involvement, that it should be a green oasis. Three types of green façades are used in this green oasis.

On the left the green façades again differ in colour and plants to create recognition of the own front door. Ivy or other kind of planting grows naturally with the help of the wooden battens which are attached to the wooden façades of this volume.

On the right the façades are finished with plaster, the loggias are finished with wood and on the horizontal part plants will grow on the so called black box facade.



This visual shows the public courtyard from the other direction.

On the right again the different green façades with its ivy growing naturally on to the wooden battens.

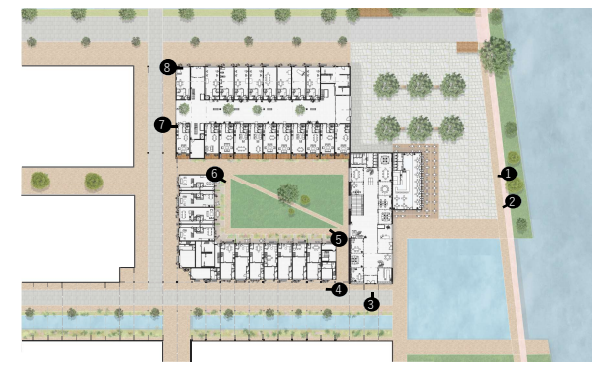
In front a green facade growing on the crossed wooden battens. Behind this greenery a brick facade is placed, using brick parts of the existing facade where they are removed. This creates a reference to the brick wall which is still visible on the inside of this volume.

Both visuals show the gardens and loggias of the dwellings, acting as a transition zone from public to private.



## VISUALS

This drawing shows the new plan of the whole urban block at ground floor level.



Here one can see the sight line as mentioned in the first visual.

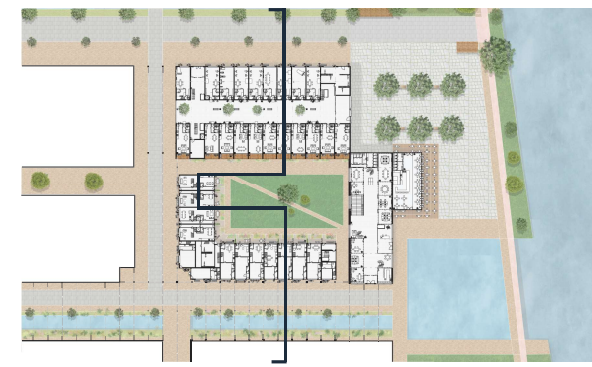
Since the axis of the volume can not be used for dwellings because of a lack of daylight, the corridor has been placed in the middle of the volume. The corridor will be a bright atrium where the height and construction is determining the space. Furthermore with this atrium a sight line is created over the length of the hall. The atrium is an collective entrance space for the dwellers and acts as a transition zone from public to private.



This visual shows the north existing and preserved facade of the factory. It is a hard facade with a strong rhythm. However the drawing shows the transition zone from public to private. Flowers, plants and furniture are used to soften the transition. Furthermore, on the ground floor where the ateliers are situated to create an active plinth, garage doors are placed. These doors, when opening, will create a little roof. This will soften the transition zone.

The thin window frames, without an outer sill, will have the same blue colour as the existing window frames and the height and width of the windows are kept. All is done in order to preserve the look, touch and feel of the existing skin.

The outdoor space exists of a large sidewalk and a large cycling path which is also accesible by car.



Factory street with its construction and length.

Transition zone. Language of existing façades & recognition of the own front door.

Flexibility: size of the workspaces & living/kitchen north (factory street) or south (green oasis). Outside spaces north and south.

Green facade part of green oasis - recognition of the own front door.

"Meergeneratiewoning" or another kind of living separately whilst together (social control). Flexibility in living or kitchen at factory street or green oasis. Ground floor at factory street always has liveliness.

Corner of the footpath = wow moment! Green oasis! New world, whilst being inside the 'factory city'.

Loft dwellings with existing construction, mezzanine and large heights to preserve the industrial character inside.

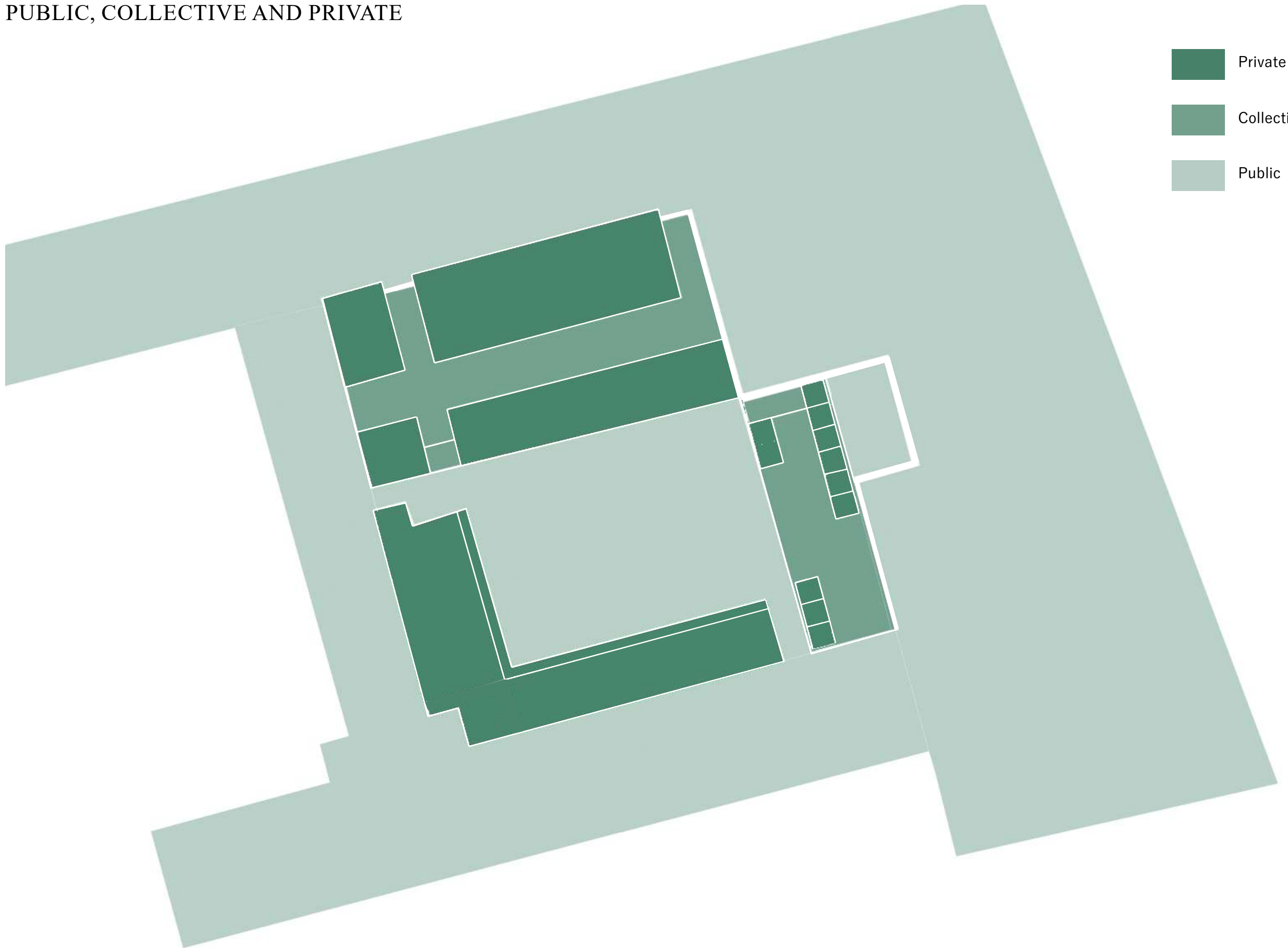
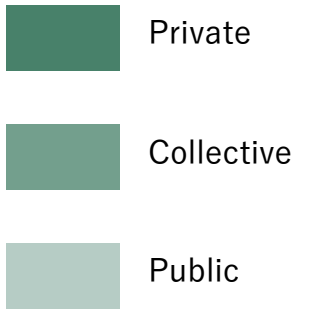
Bright atrium as a transition zone with its sight-line, height and construction.

Topping: bright penthouses with wide views and open living and kitchen.

Loft dwellings and atelier dwellings with large heights, existing window sizes and existing construction. Ateliers with garage doors creating a softer transition zone.

Wide sidewalk and cycling path next to the active plinth of the ateliers, situated at the north for the perfect lightning.





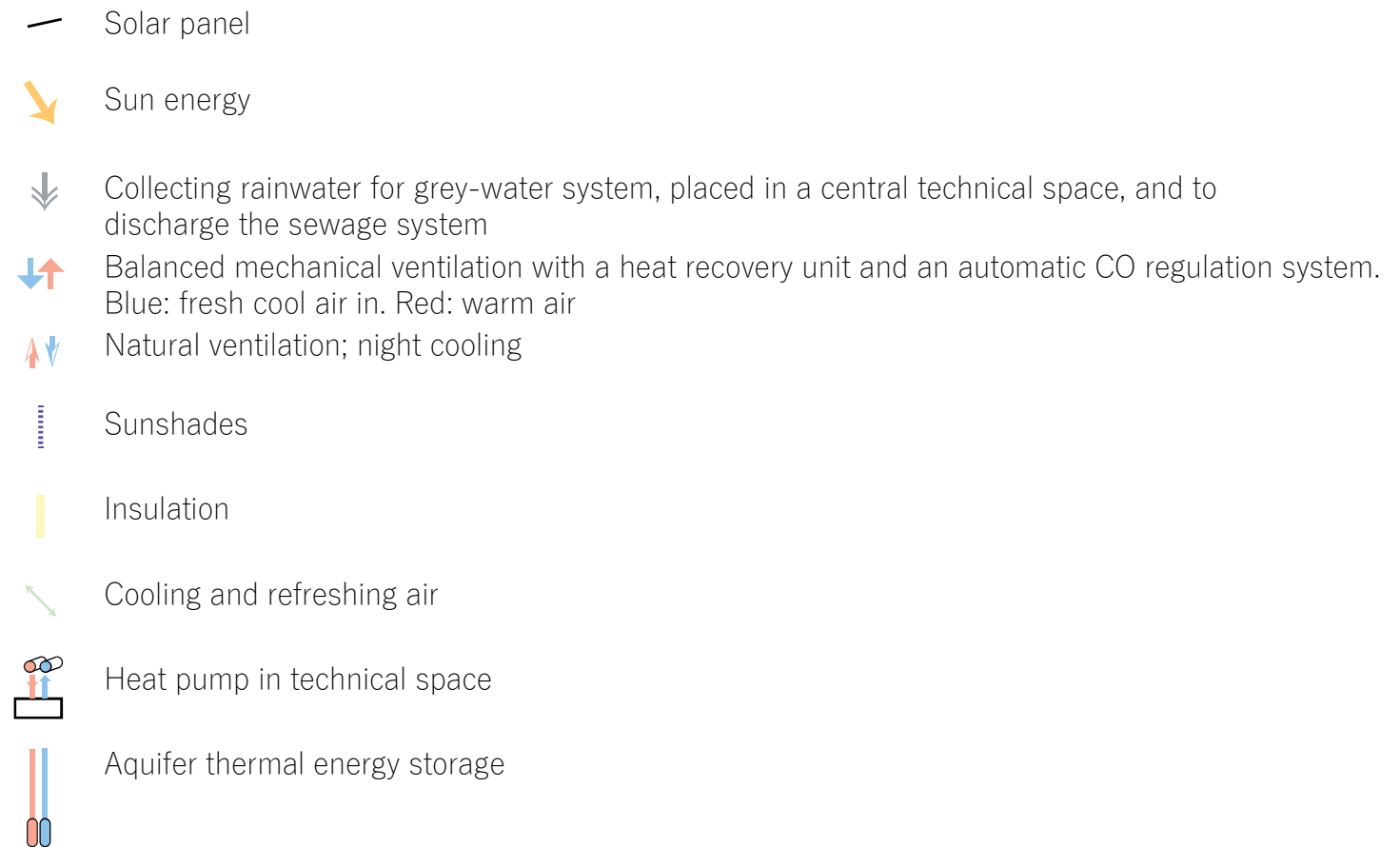
## CLIMATE CONCEPT OF THE URBAN BLOCK NORTH SOUTH

The drawing below shows the climate concept in a section, taken from south to north, in summer time. All volumes with a residential function are provided with a balanced mechanical ventilation system with an automatic CO regulation system. Furthermore, heating and cooling is done by floor heating and cooling. This system is being connected to the heat pump with aquifer thermal energy storage. The two volumes have their own technical space for the heat pump and grey water system.

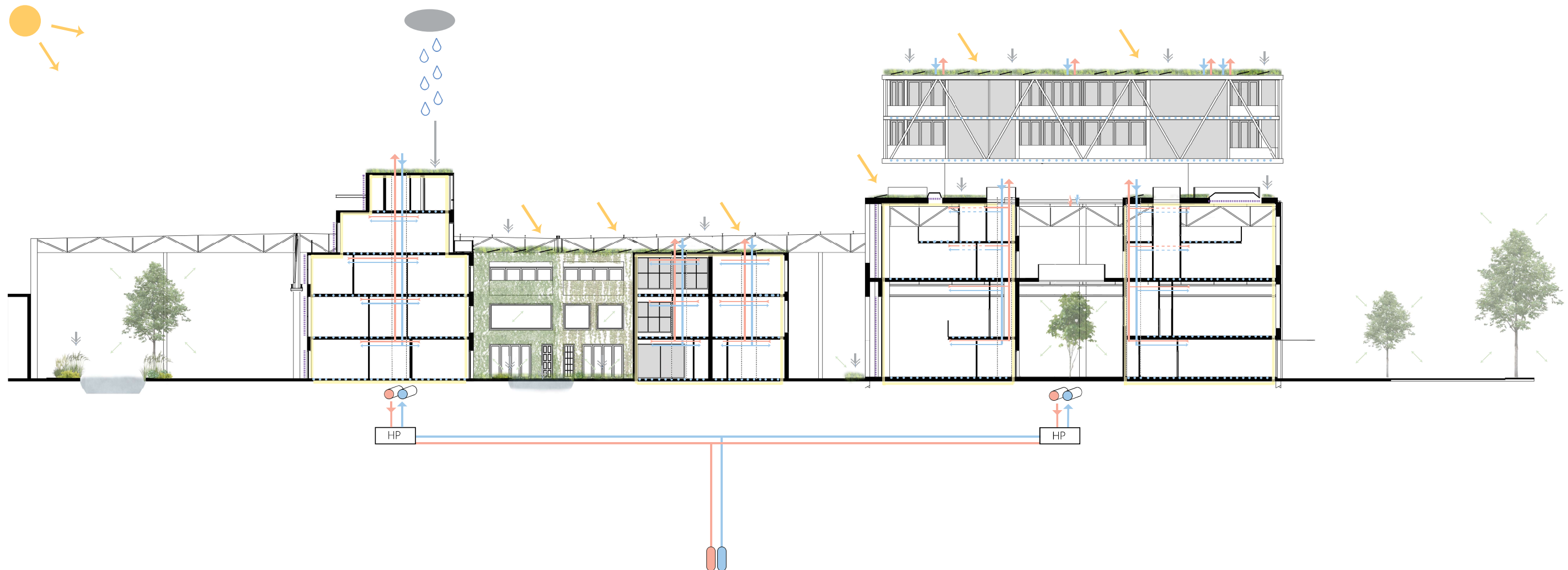
According to Benno Schepers, senior researcher/advisor and leader of the sector sustainable cities, the cooling demand is larger than the heating demand, as can be read in the research booklet, Kabelfabriek 2.0 on page 69. Therefore it is necessary to keep the sun out in summer. This is done with sunshades, for example sliding wooden panels and cloth exterior awnings. Next to this, the solar radiant heat total transmission of the glass of the topping will be chosen wisely in order to keep the heat out and the light in.

The atrium, a collective non-insulated space, is provided with a night-cooling system, which means that during night-time the roof windows will be opened for fresh cool air.

The public space is designed with facilities for collecting rainwater for cooling down the public space. For example the patio contains a 'wadi' in case of an overflow of rainwater.



Summer



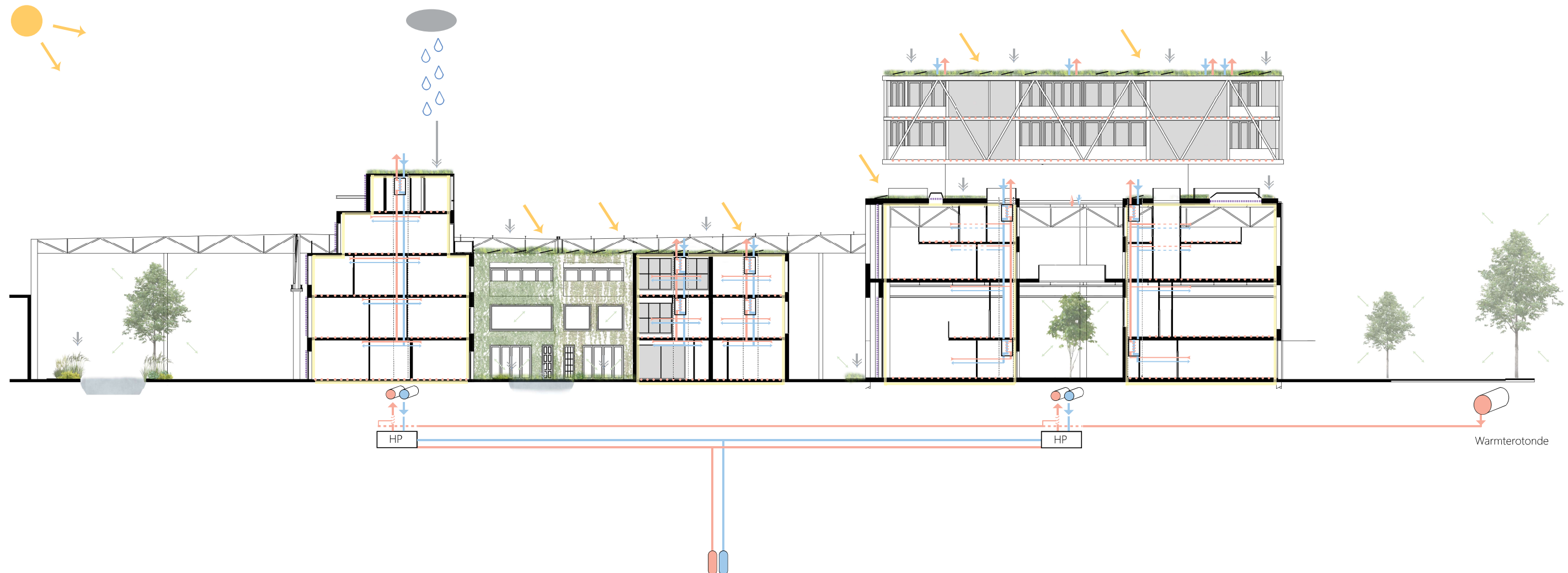
## CLIMATE CONCEPT OF THE URBAN BLOCK NORTH SOUTH

The drawing below shows the climate concept in a section, taken from south to north, in winter time. All volumes with a residential function are provided with a balanced mechanical ventilation system with a heat recovery unit. This means that fresh air will be warmed up with extracted warm air from the dwelling. Furthermore, heating and cooling is done by floor heating and cooling. This system is being connected to the heat pump with aquifer thermal energy storage. Next to this, the system is linked with the 'warmterotonde' as an addition in case extra heat is needed.

All volumes are insulated, either from the inside or the outside. For example, the existing highly valued north facade is insulated on the inside to preserve the valued outside skin. The roof of this volume (01) is insulated from the outside and covered with green. The yellow line just shows that all volumes are insulated well, it does not show the location of the insulation.

- Solar panel
- ↘ Sun energy
- ↓ Collecting rainwater for grey-water system, placed in a central technical space, and to discharge the sewage system
- ↕ Balanced mechanical ventilation with a heat recovery unit and an automatic CO regulation system. Blue: fresh cool air in. Red: warm air
- ↕ Natural ventilation; night cooling
- ⋮ Sunshades
- Insulation
- ↖ Cooling and refreshing air
- ⚙ Heat pump in technical space
- Aquifer thermal energy storage
- ⚙ Heat from the 'Warmterotonde'

Winter





5

THE BUILDING

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In this chapter the volumes are worked out in more detail. Of each volume, one two and three, the following drawings are made:

Volume 01

Floor plans 1:200

- Ground floor
- First floor
- Second floor
- Third floor
- Fourth floor
- Fifth floor
- Sixth floor

Floor plans 1:50

- Dwelling second & third floor North
- Dwelling ground & first floor South

Façades 1:50

- North + facade fragment
- South

Details 1:5

- Vertical detail of the roof
- Horizontal detail of the windows with seperating wall

Volume 02

Floor plans 1:200

- Ground floor
- First floor
- Second floor
- Third floor
- Fourth floor

Floor plans 1:50

- Dwelling ‘meergeneratiewoning’

Façades 1:50

- North + fragment
- South

Volume 03

Floor plans 1:200

- Ground floor
- First floor
- Second floor

Sections 1:100

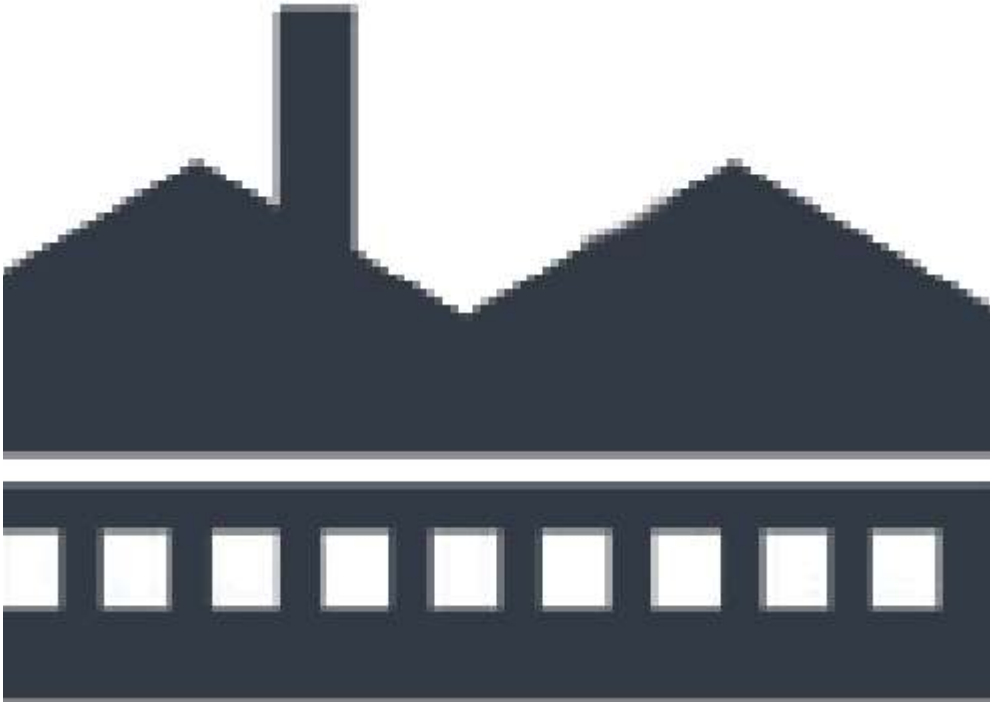
- East West

Façades 1:50

- West + facade fragment

Details 1:5

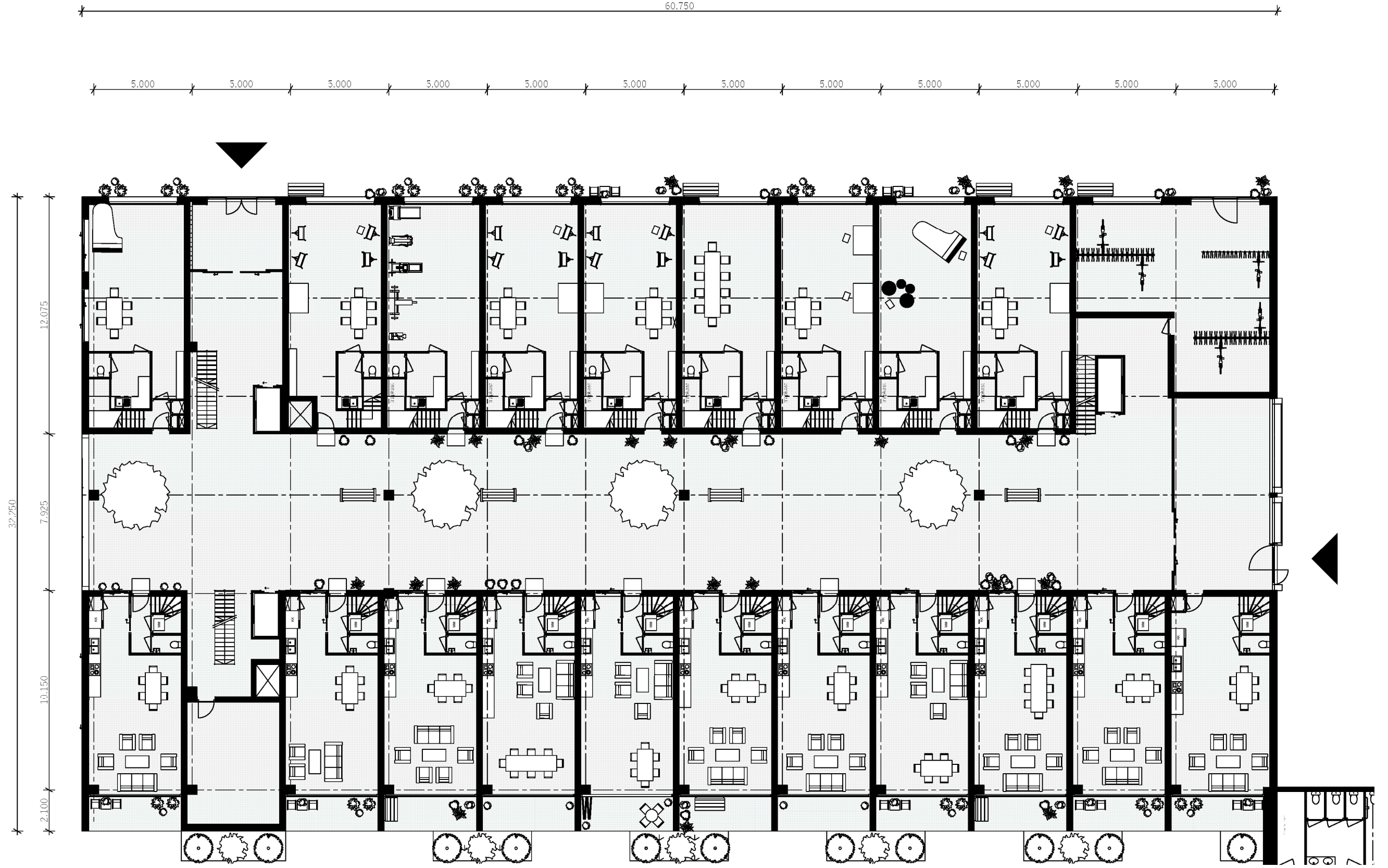
- Vertical detail of the curtain wall with a construction beam and the connection to the roof





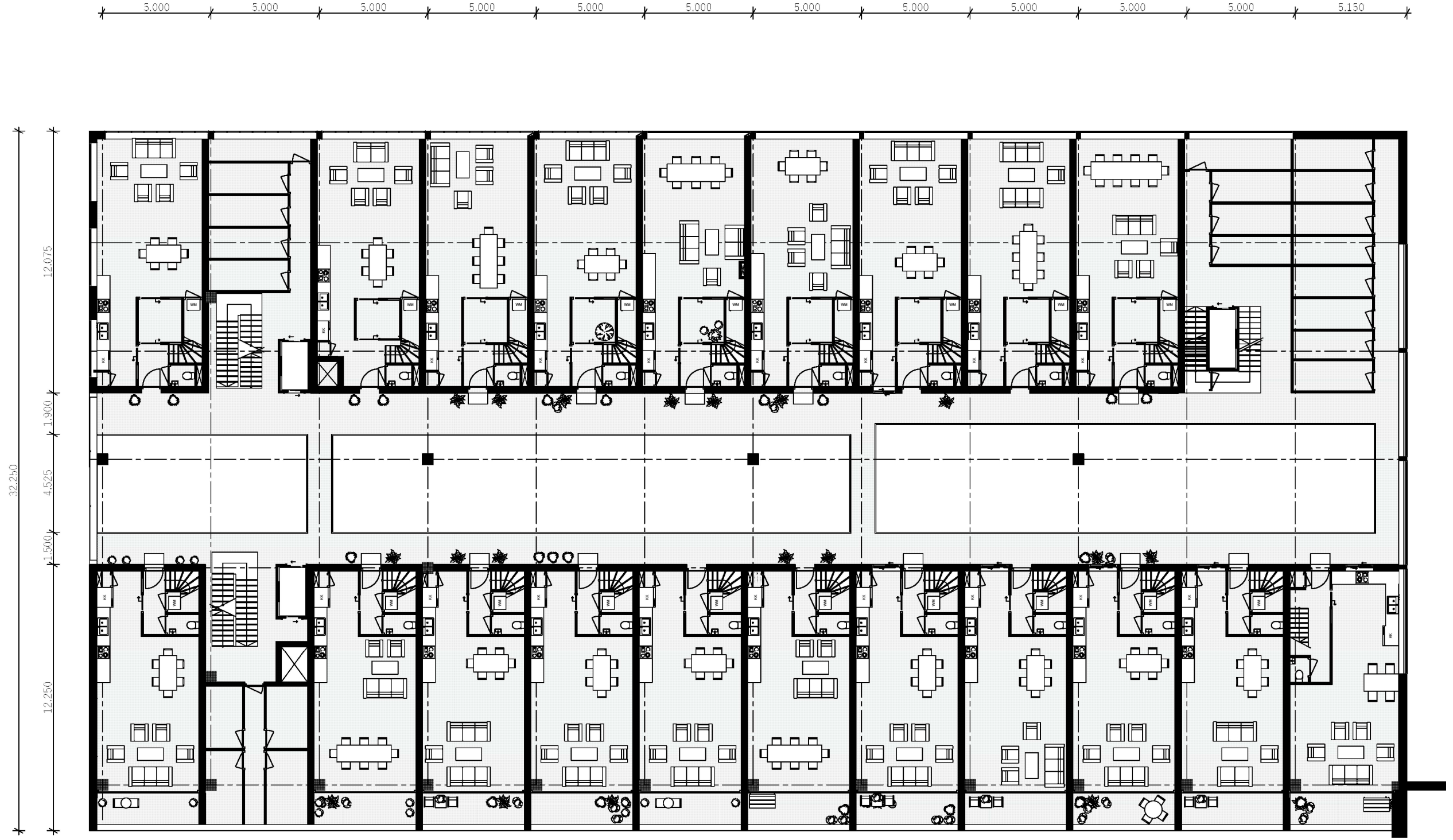


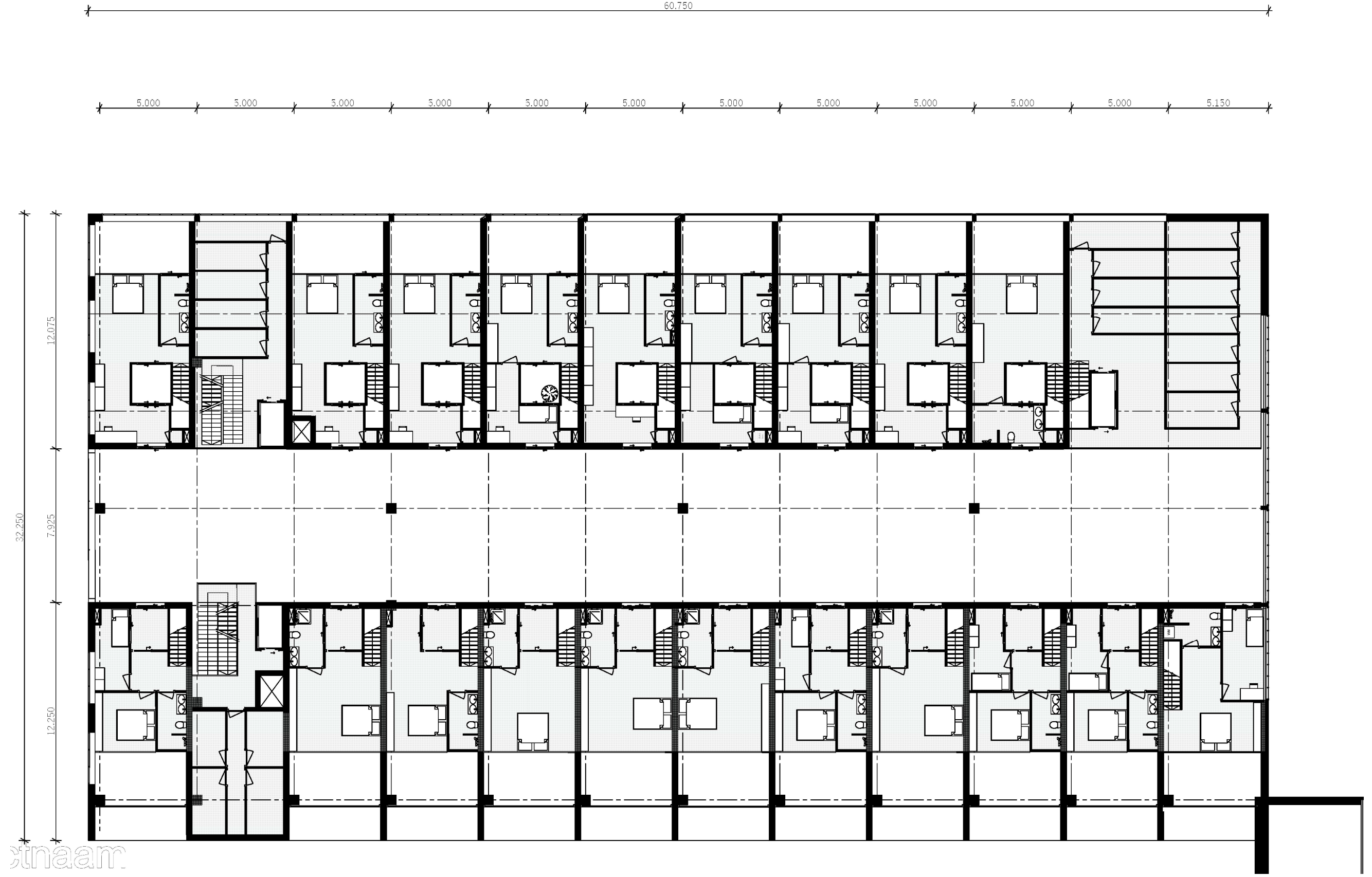




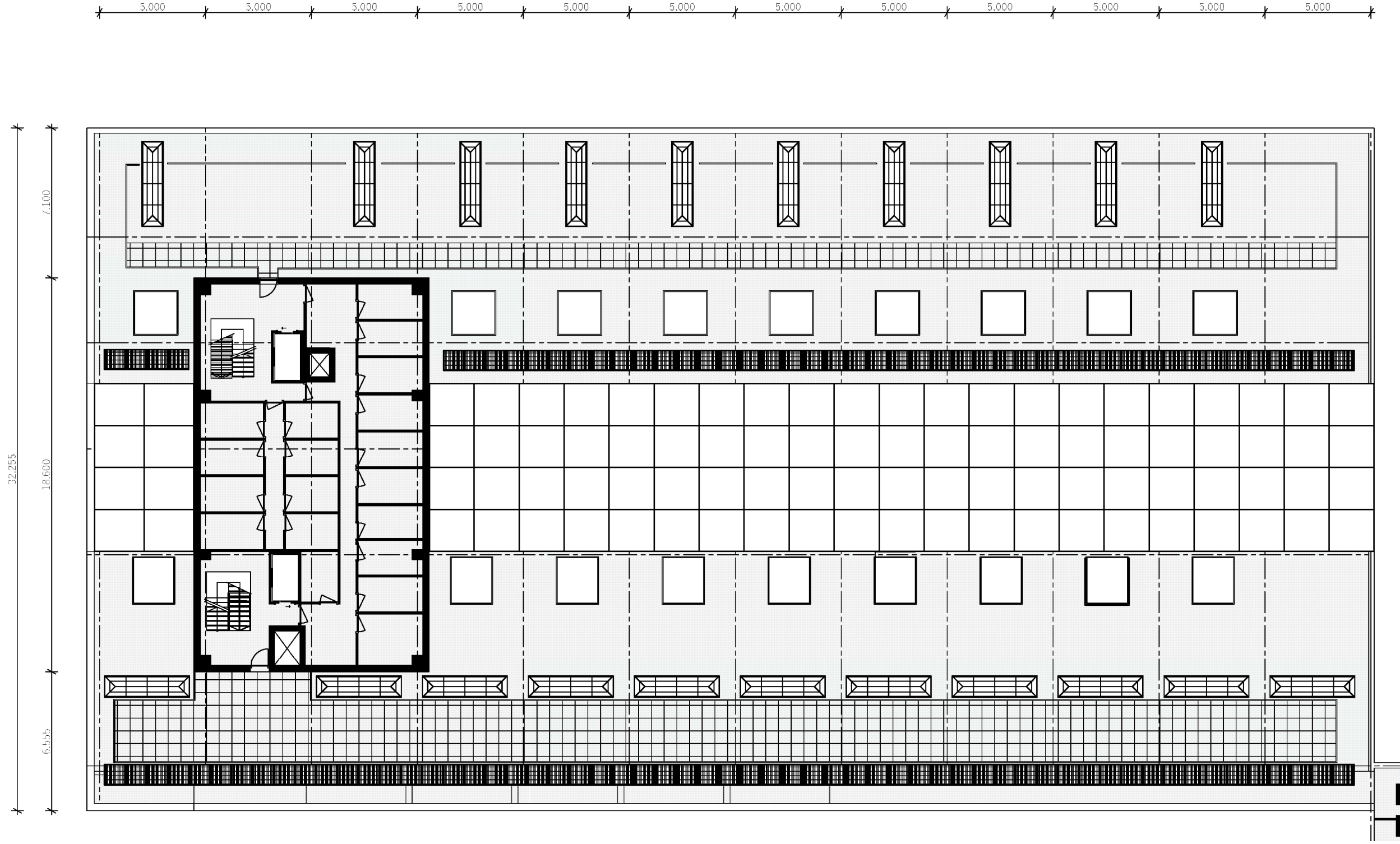








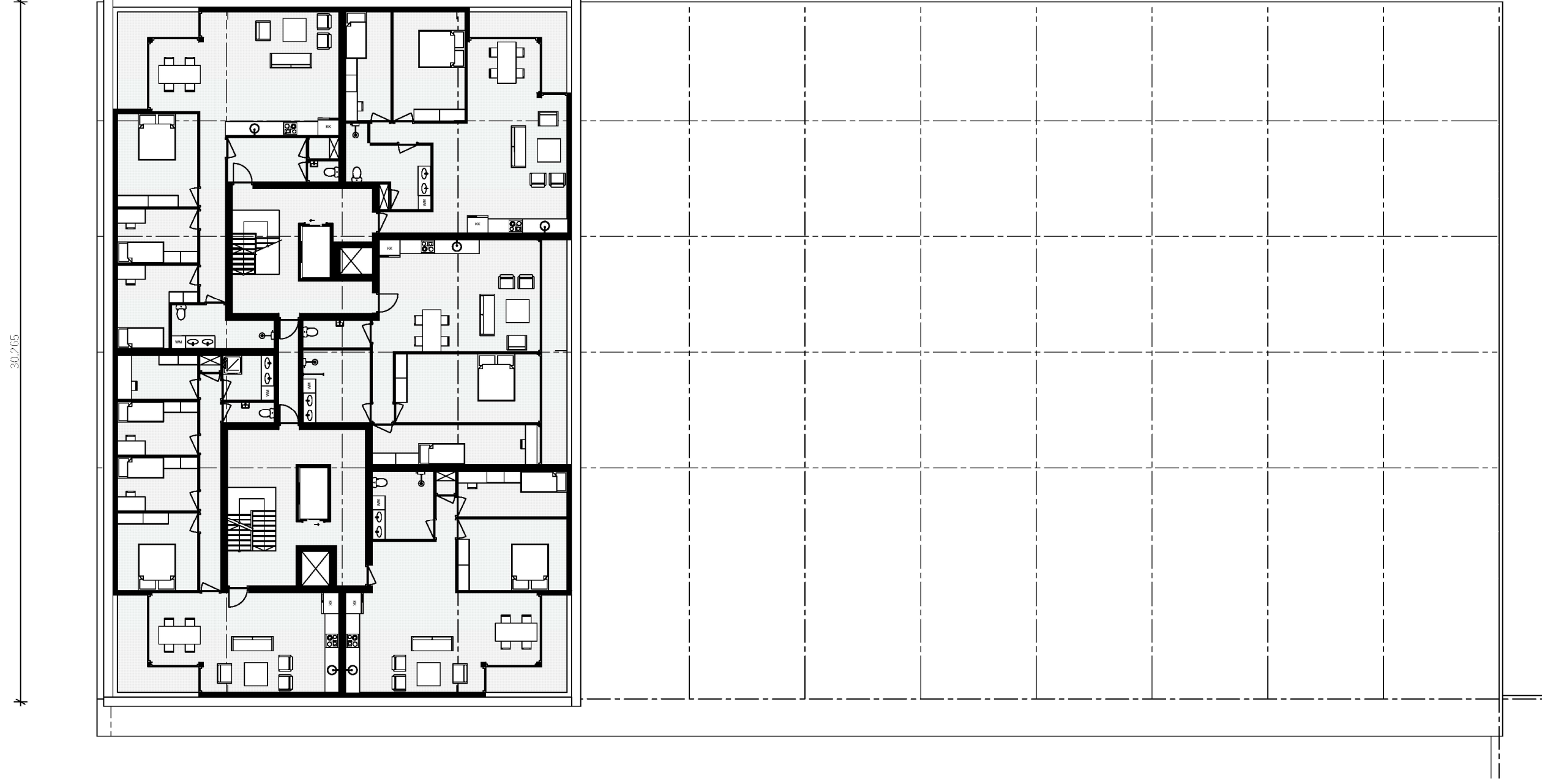


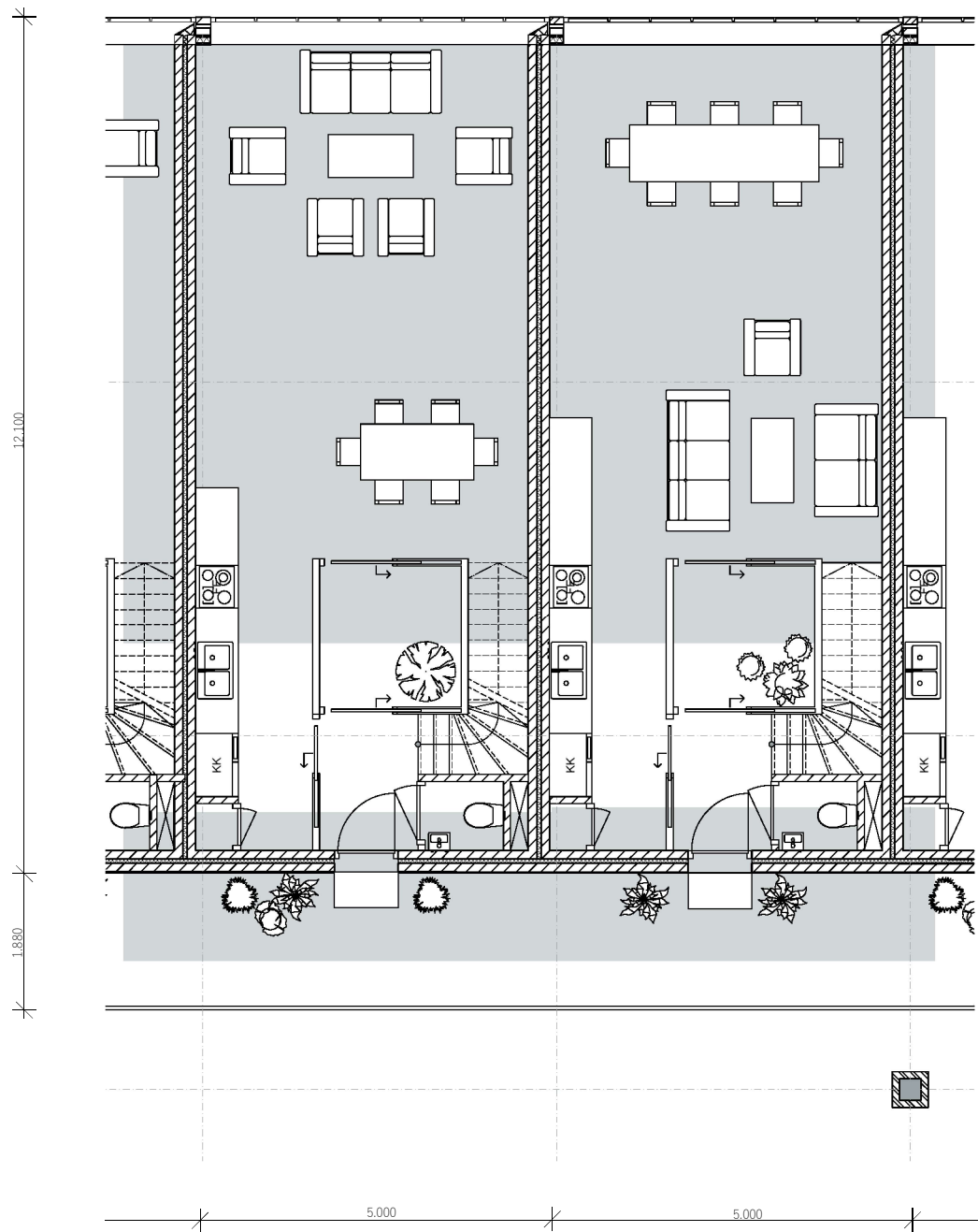


30.205

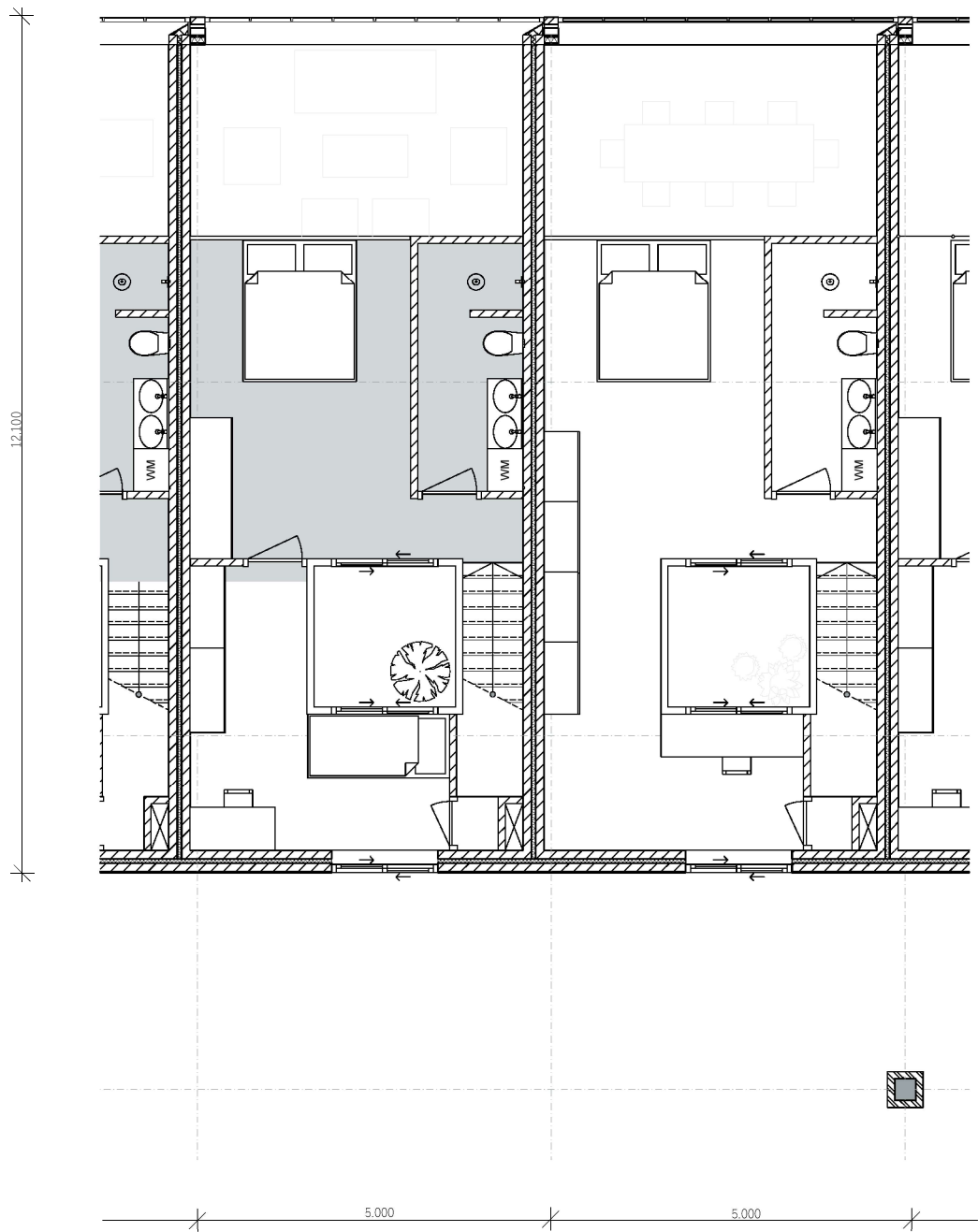








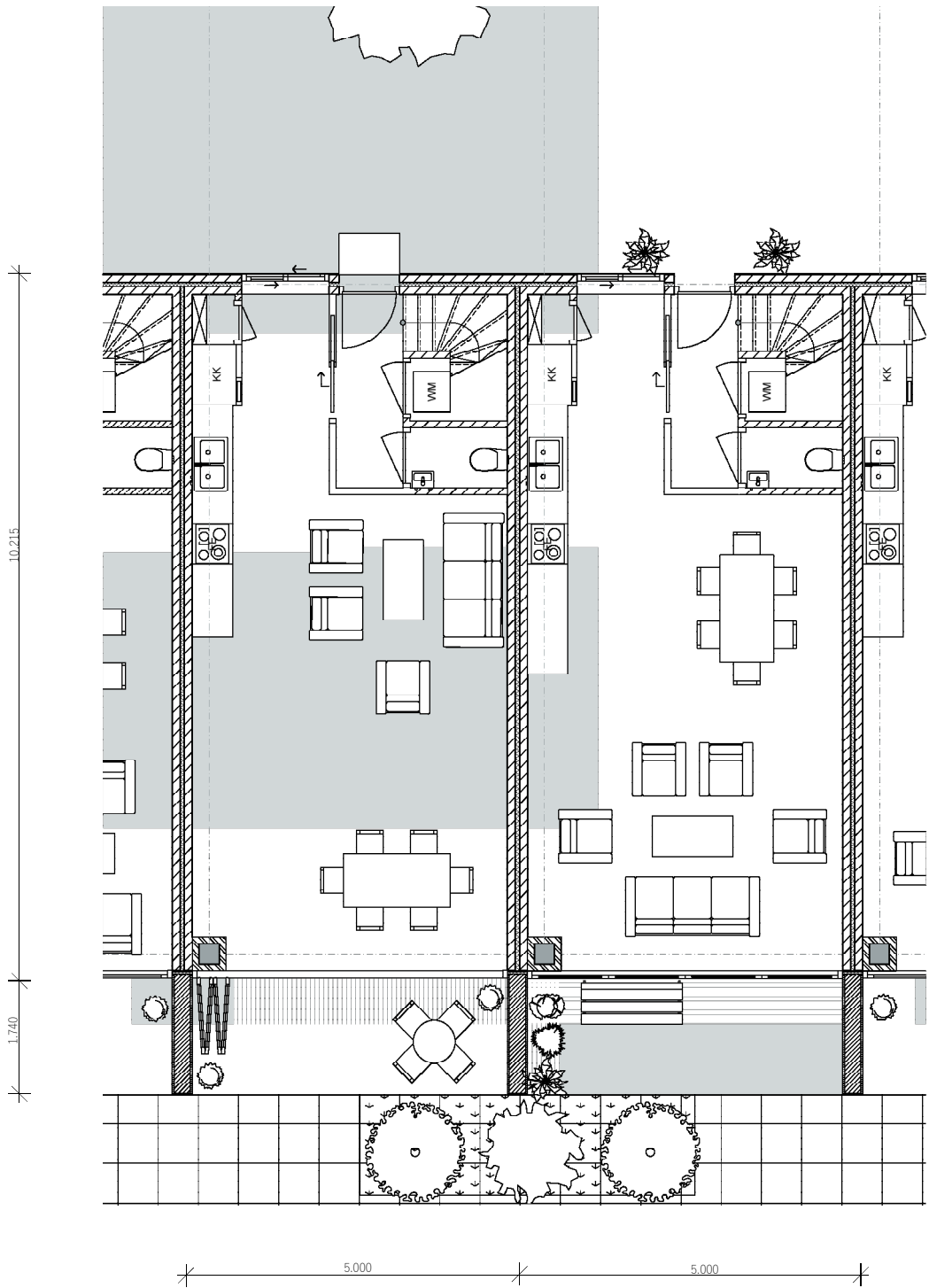
Second floor



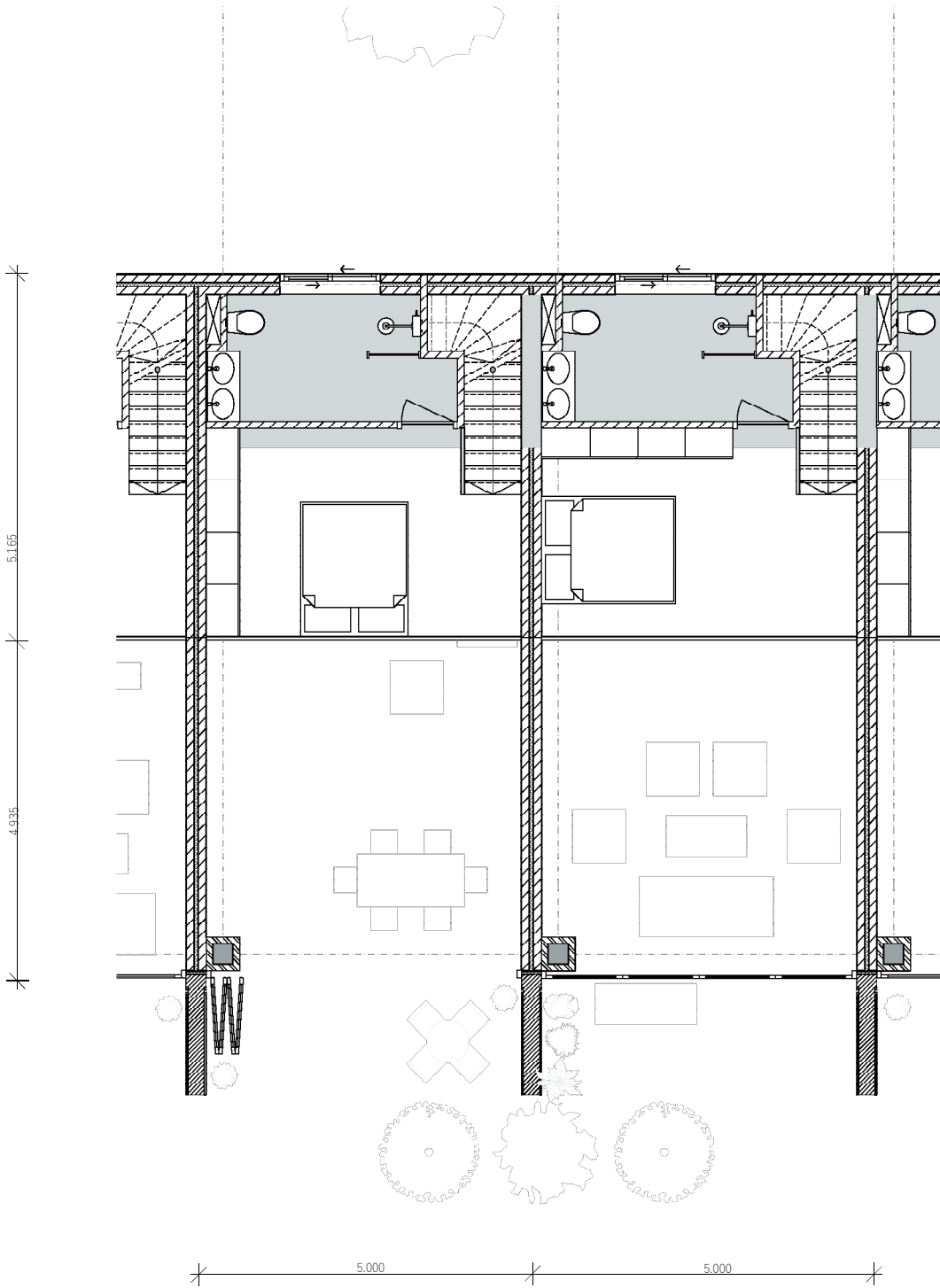
Third floor







Ground floor



First floor

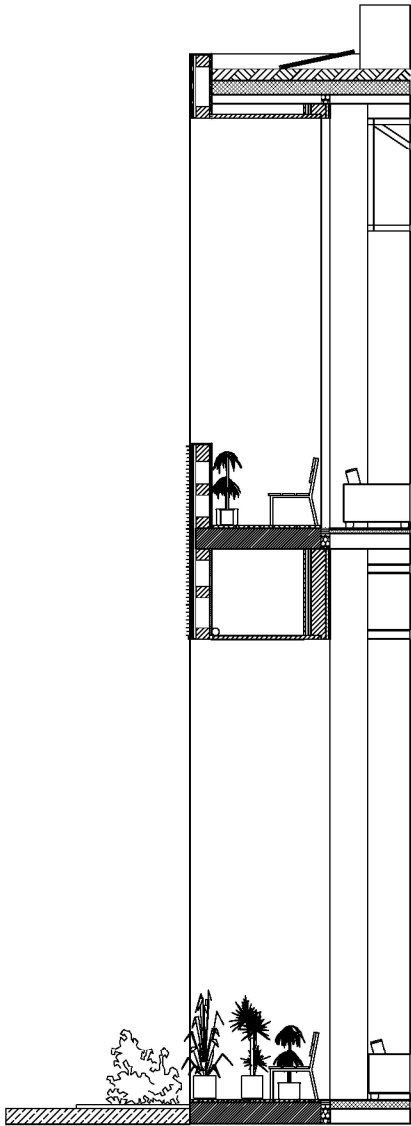




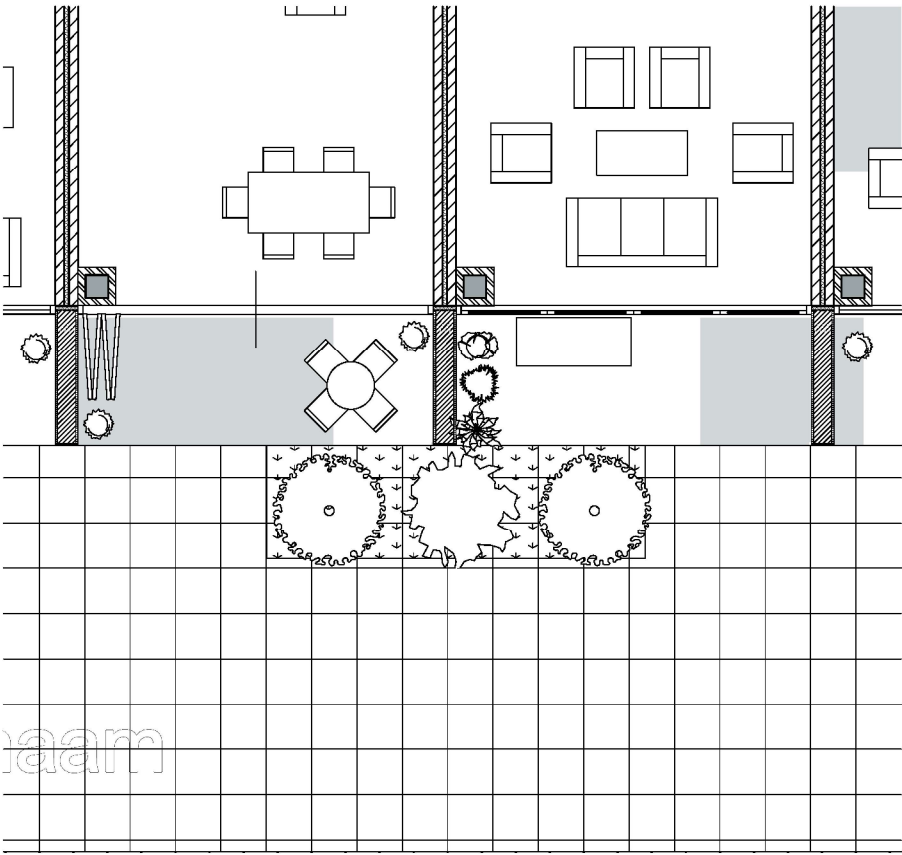




South facade



Vertical cross-cut south facade



Horizontal cross-cut of ground floor

retention wall;  
plaster  
underlayment OSB  
battening  
underlayment OSB  
battens

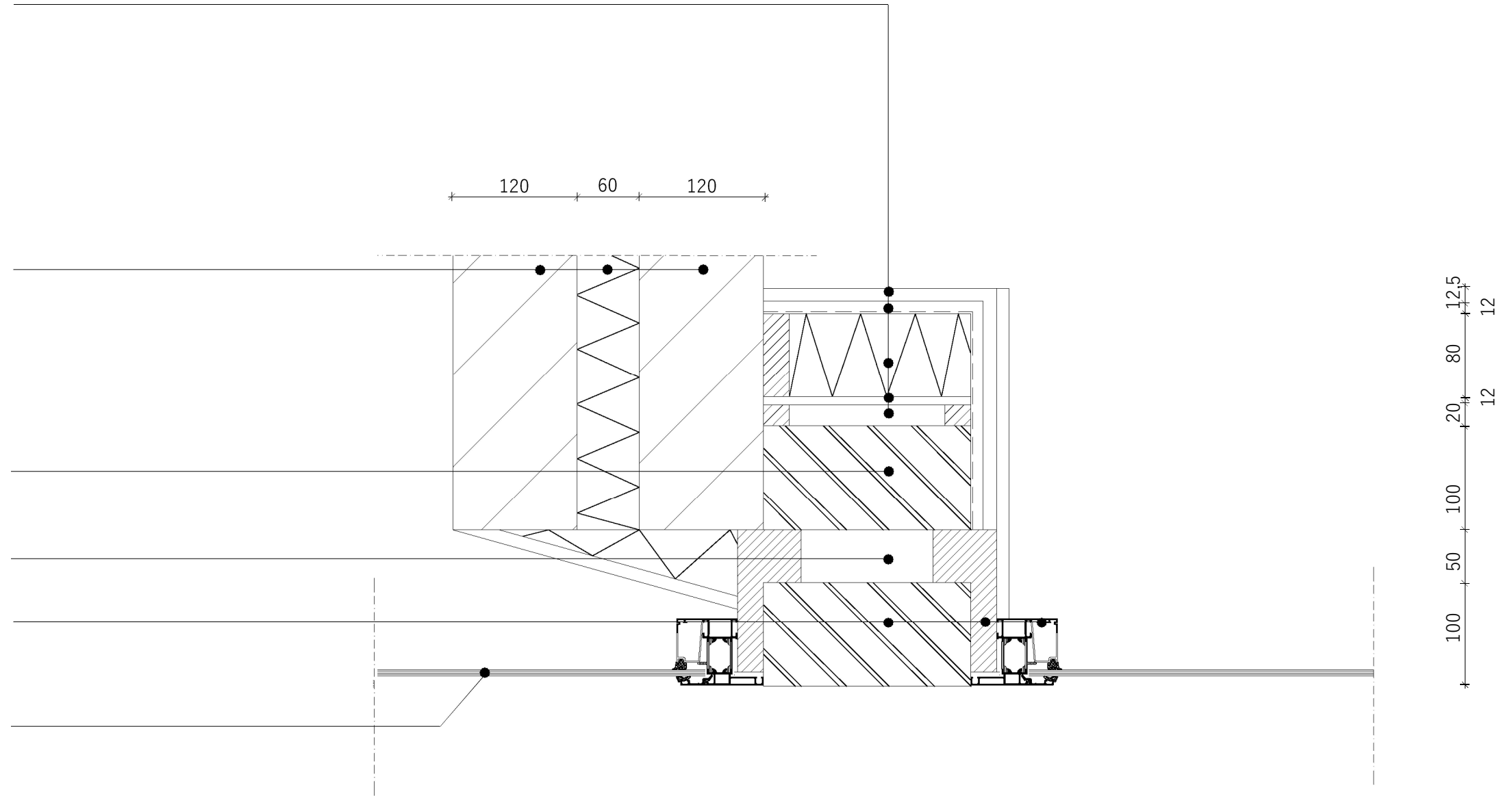
seperating wall;  
inner wall  
insulation  
inner wall

existing masonry inner leaf

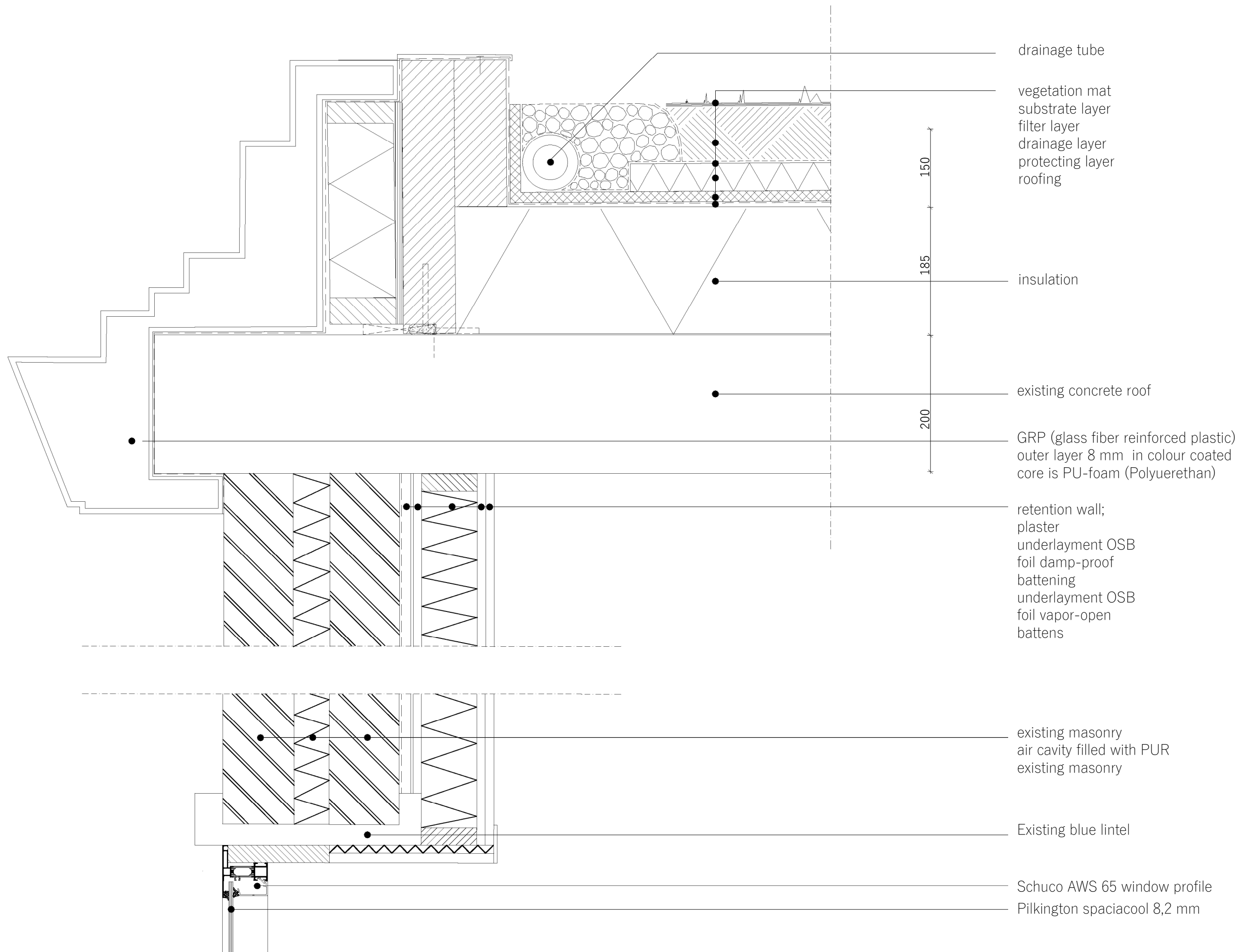
existing cavity

existing masonry outer leaf  
wooden buck  
Schuco AWS 65 window profile

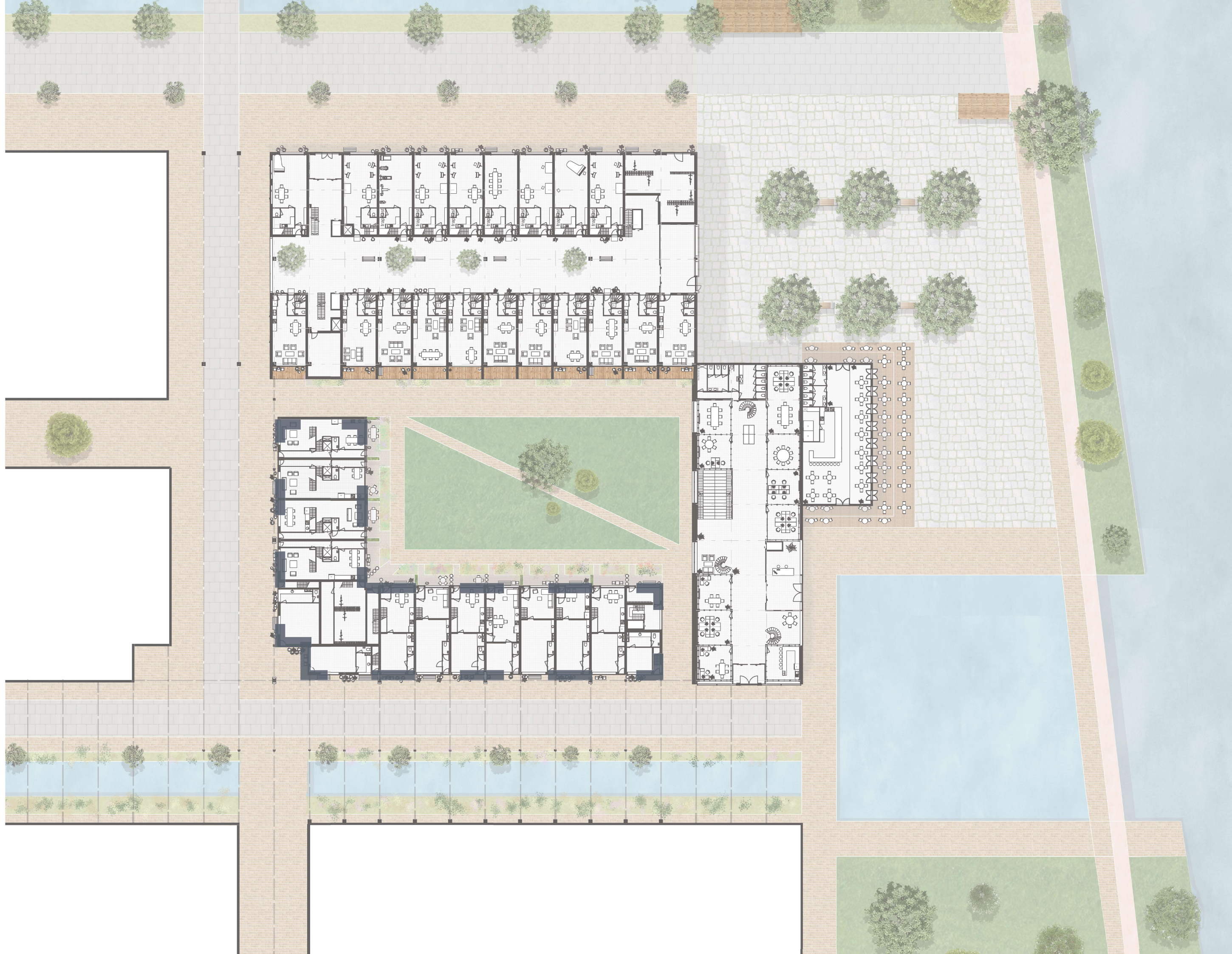
Pilkington spaciacool 8,2 mm



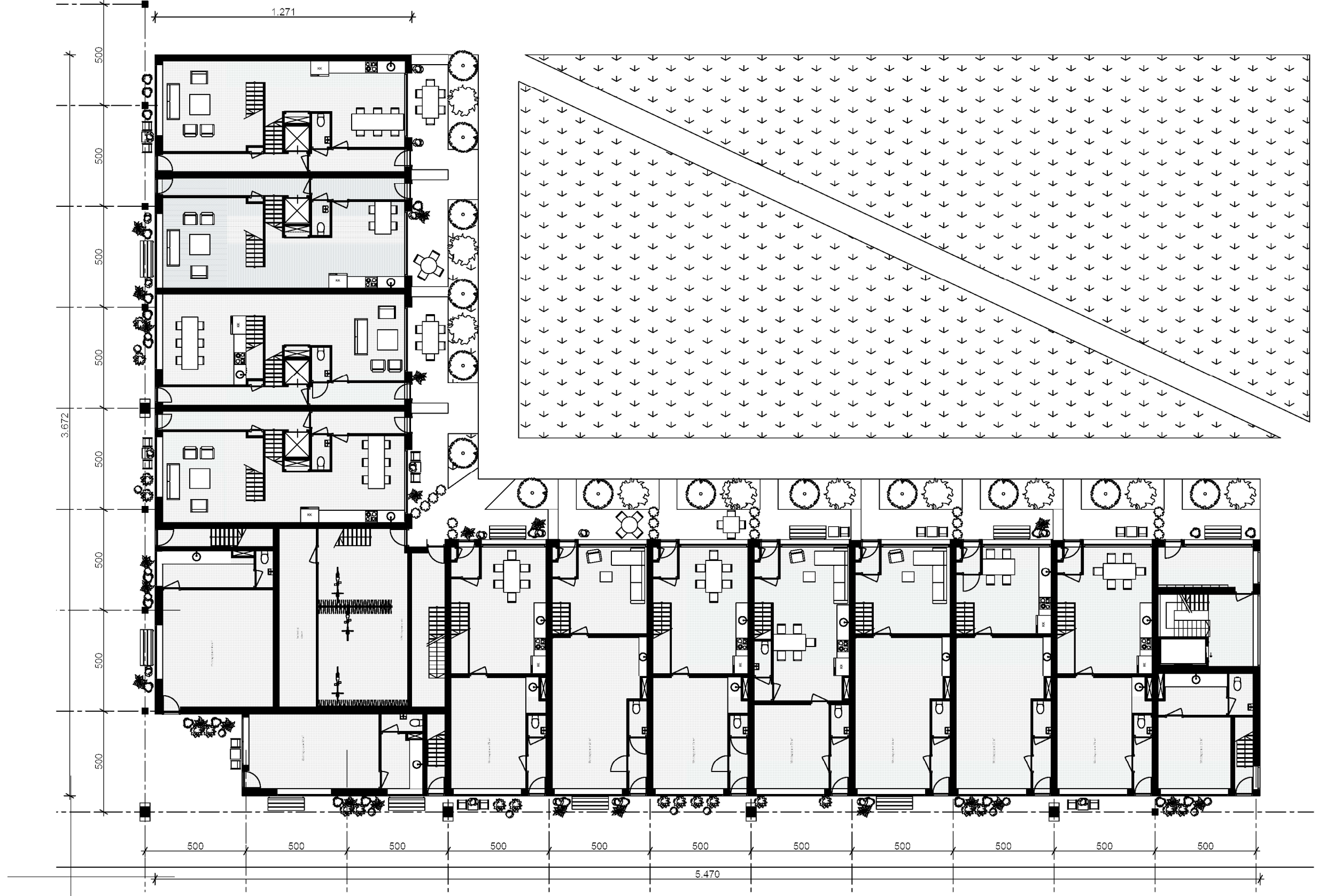






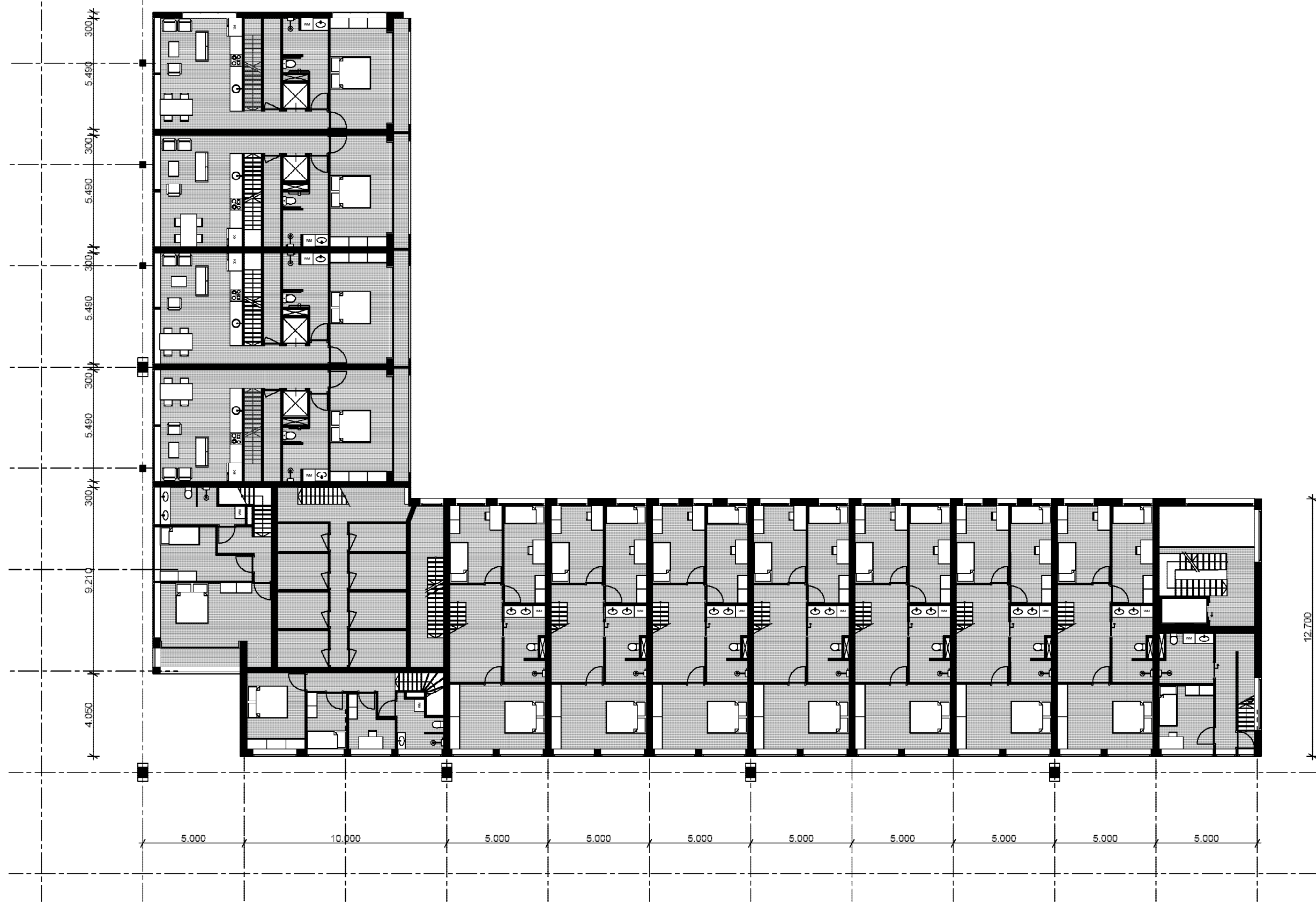


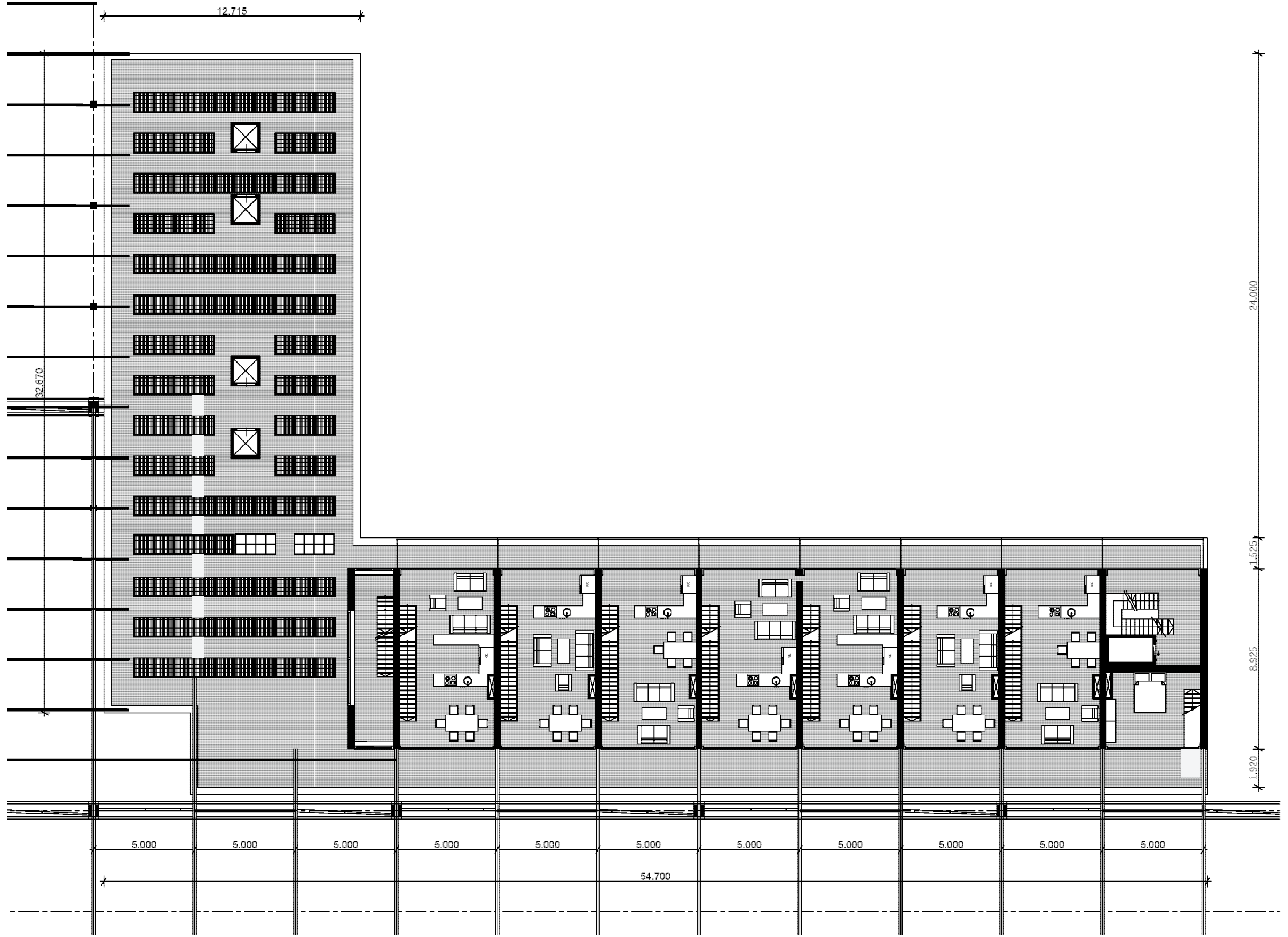




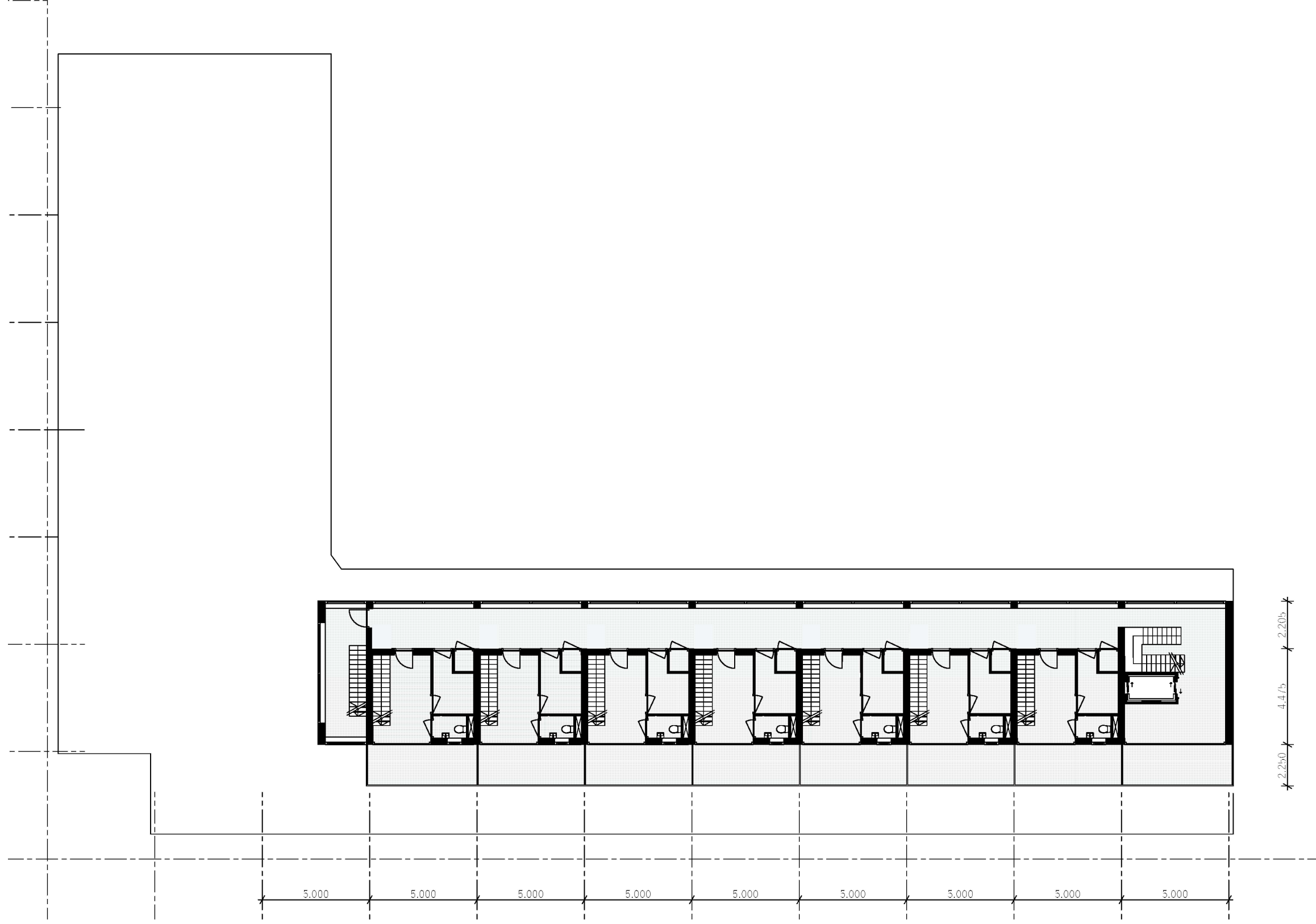


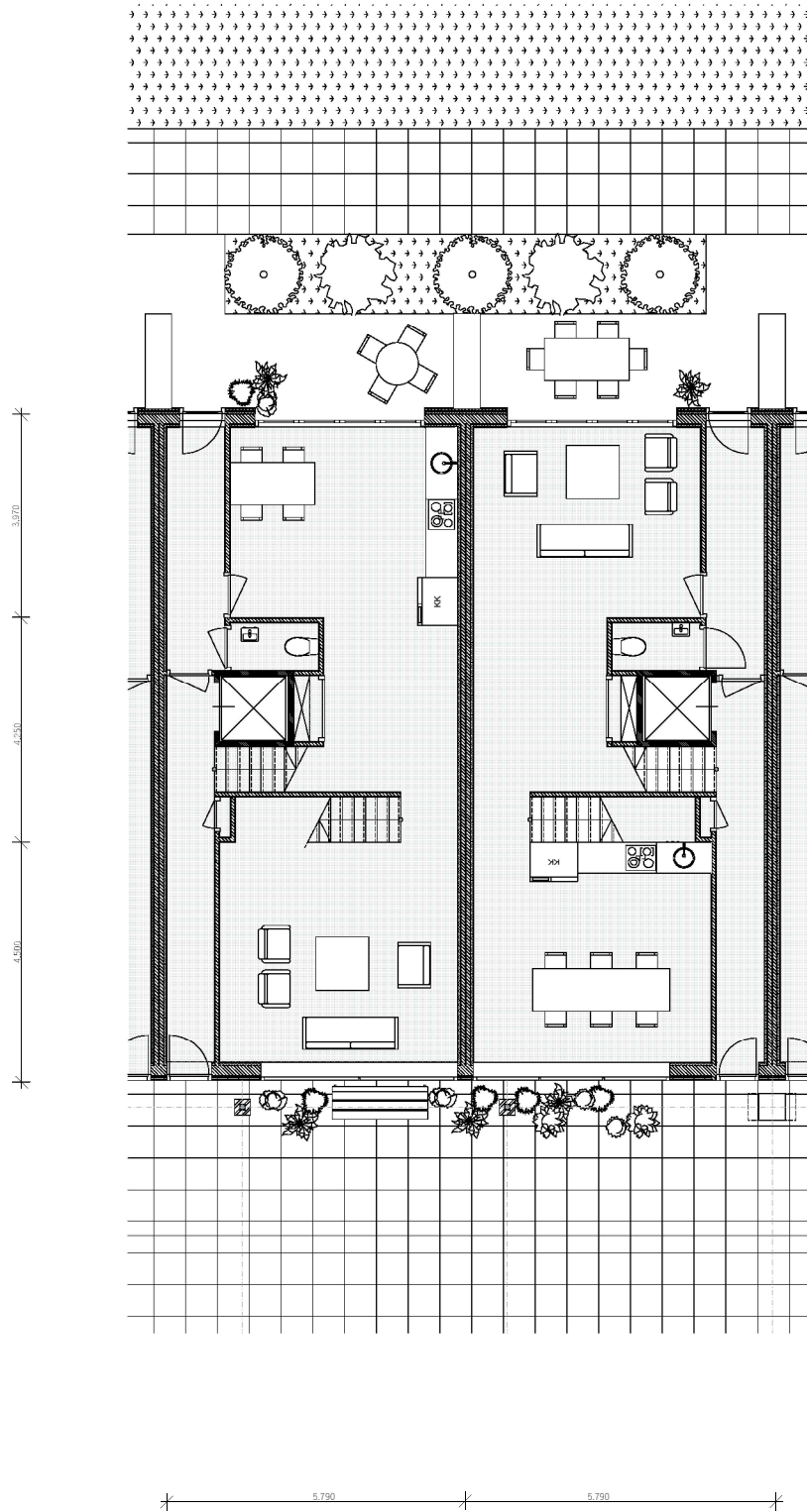




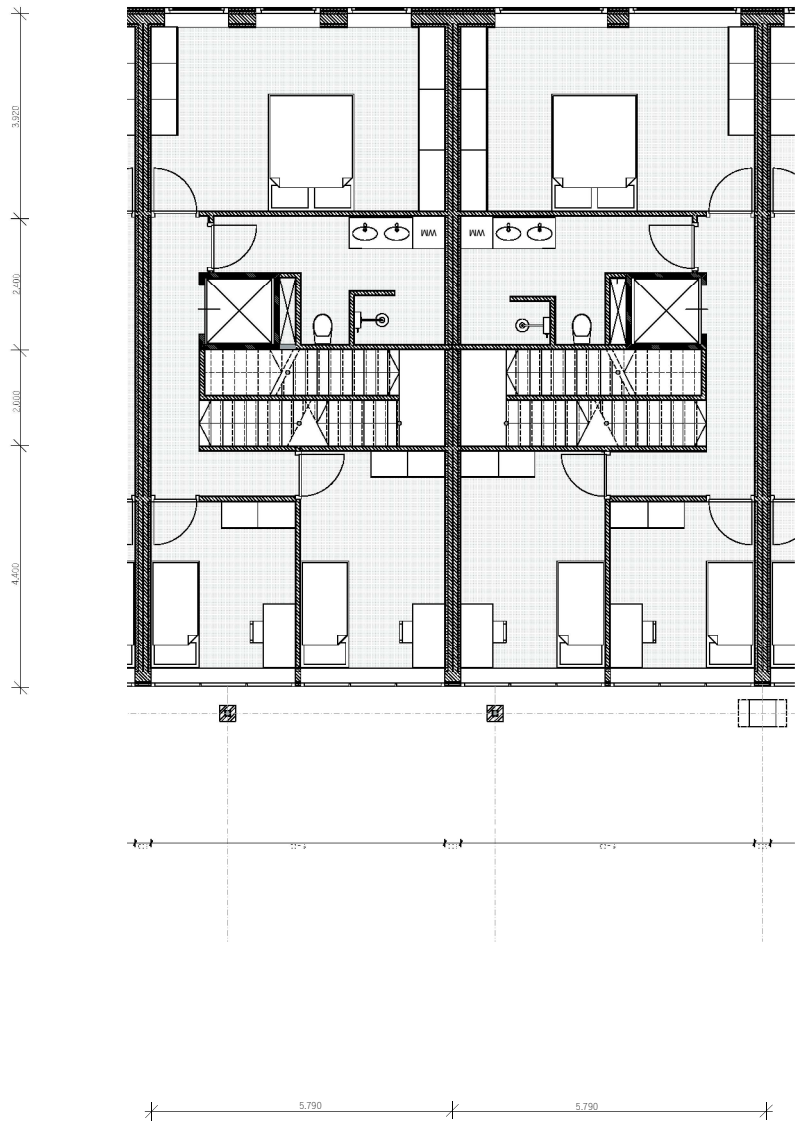




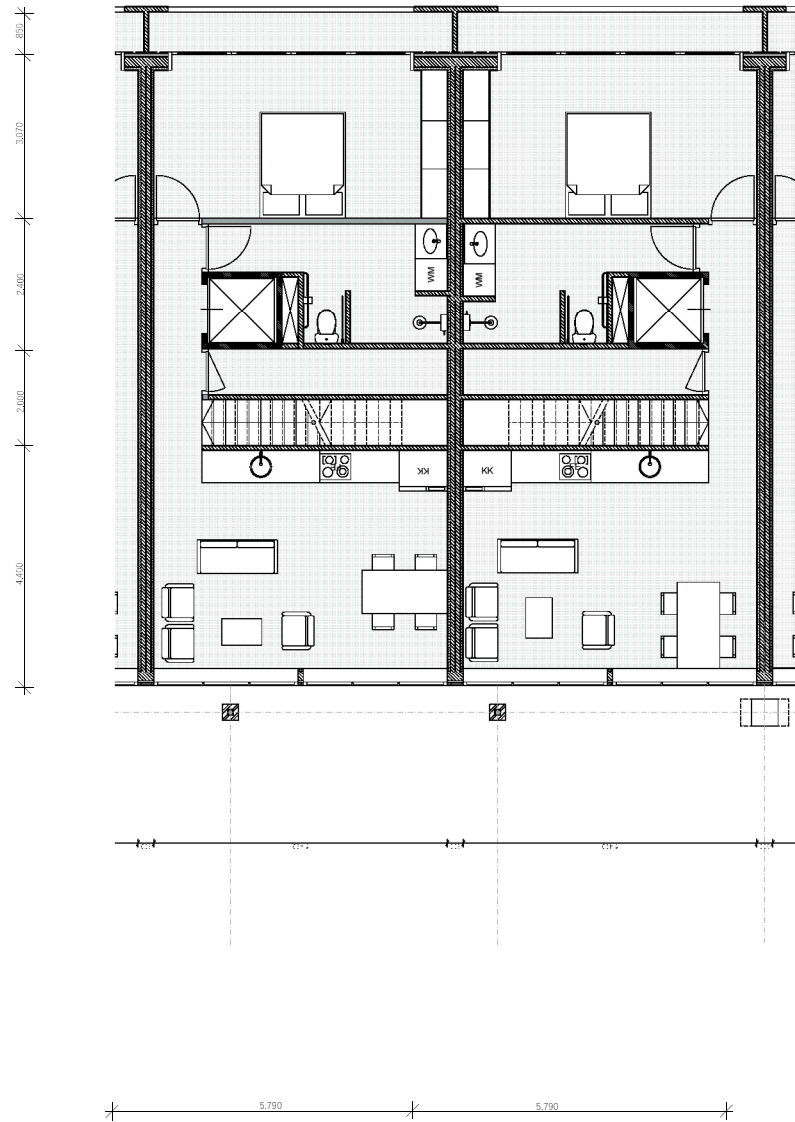




Ground floor



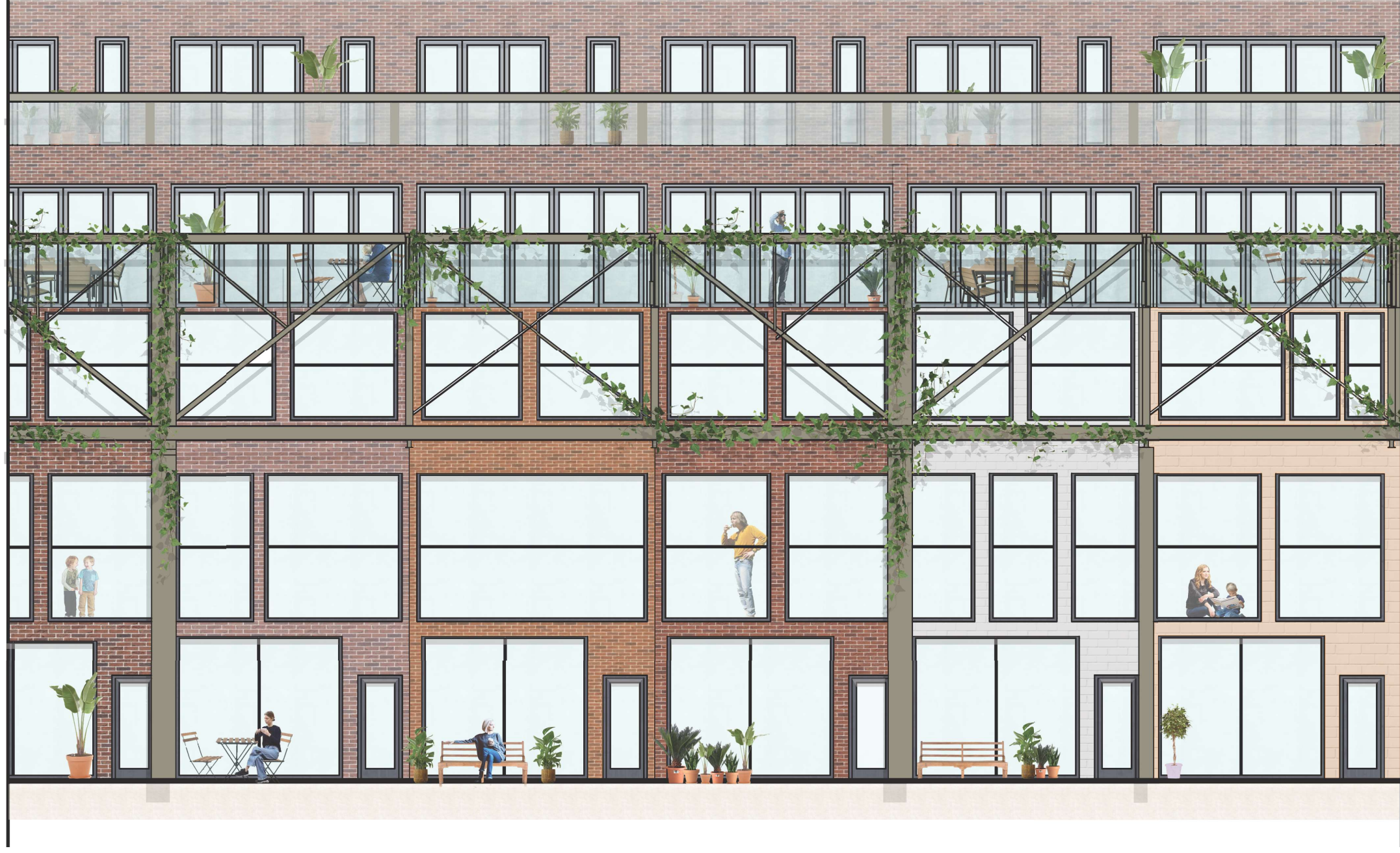
First floor



Second floor



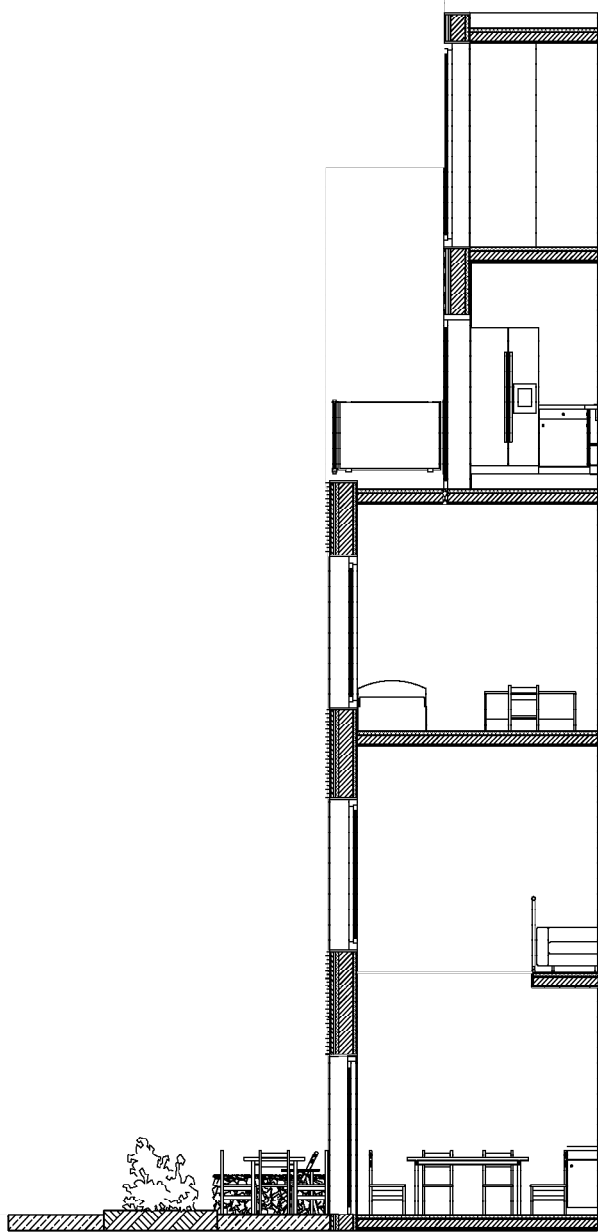




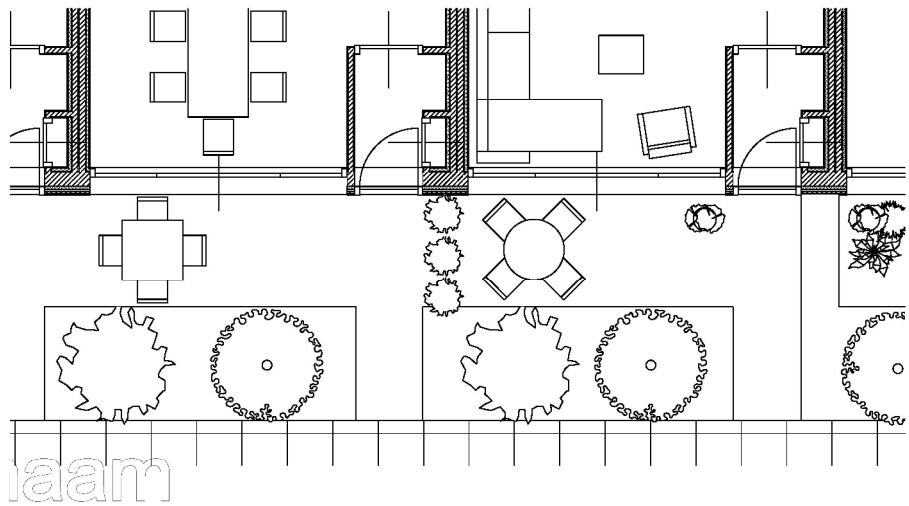




North facade

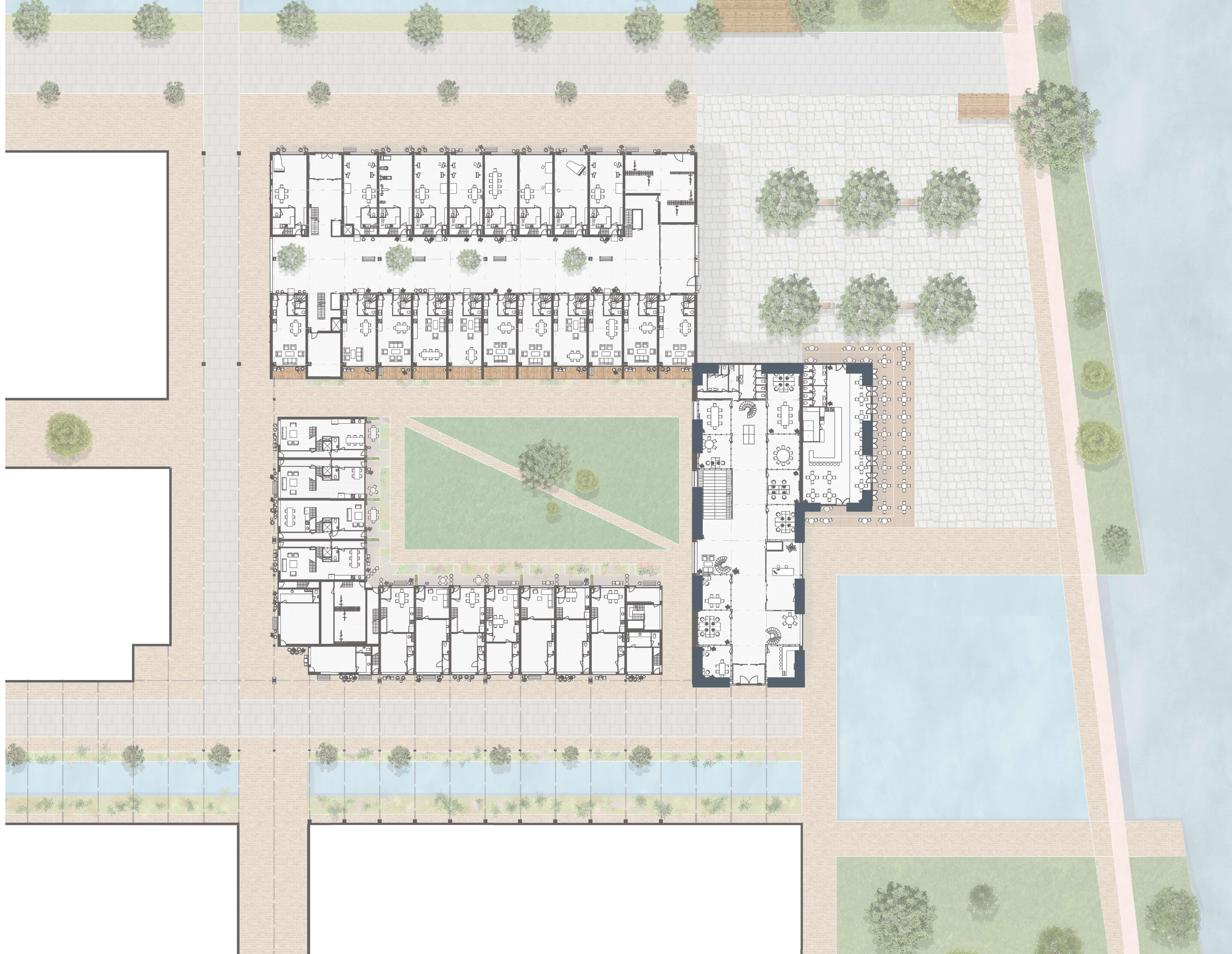


Vertical cross-cut north facade

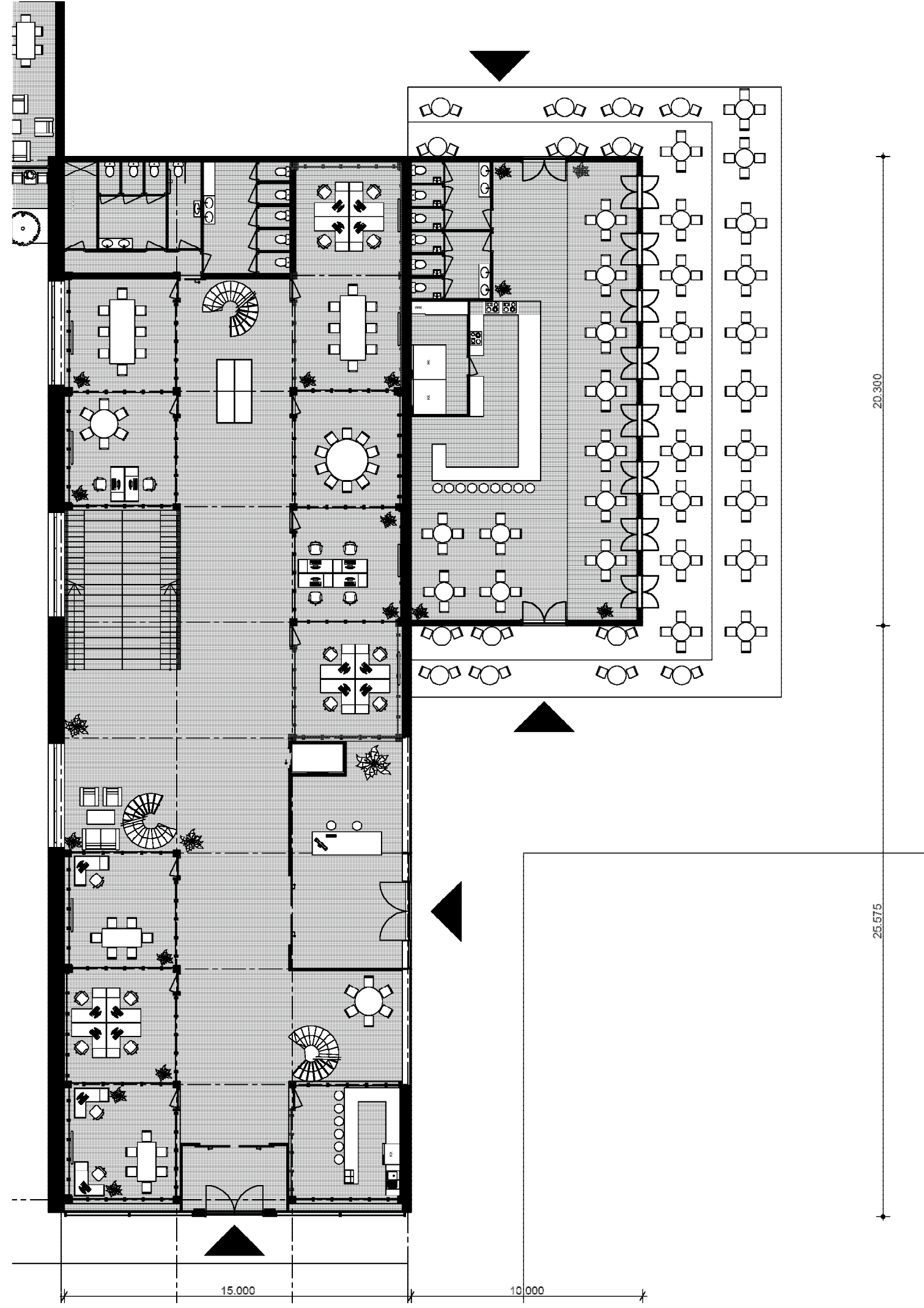


Horizontal cross-cut of ground floor

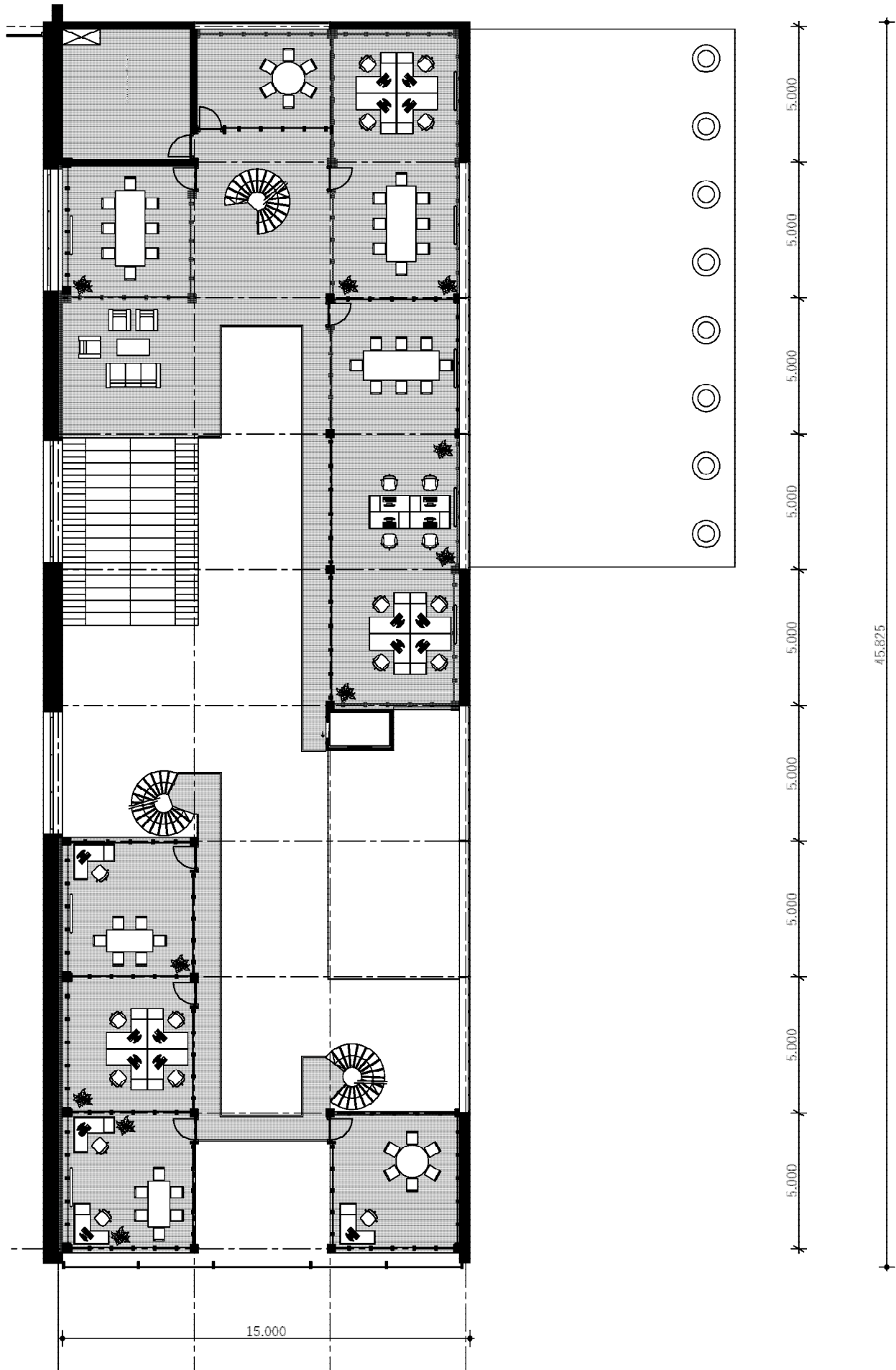


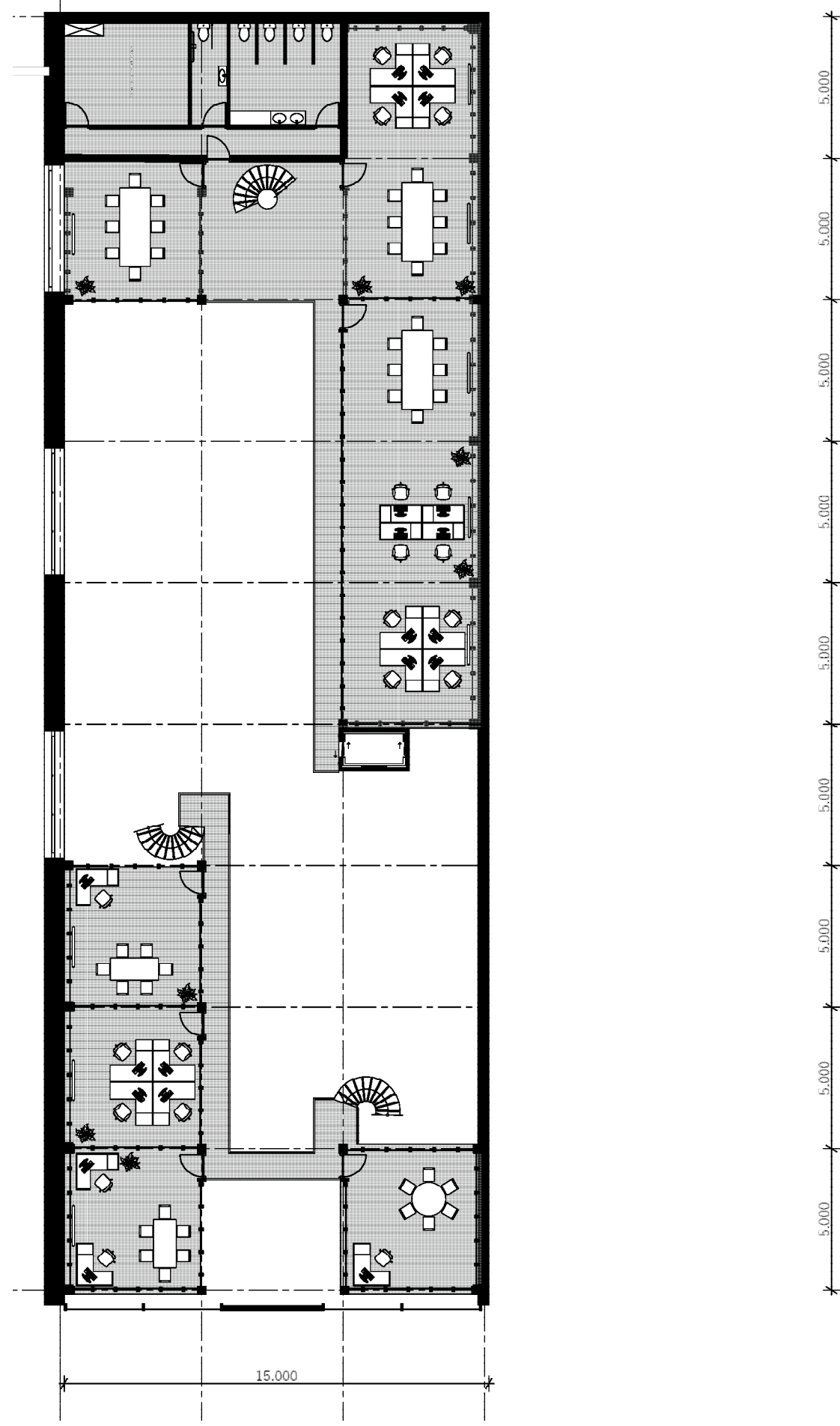








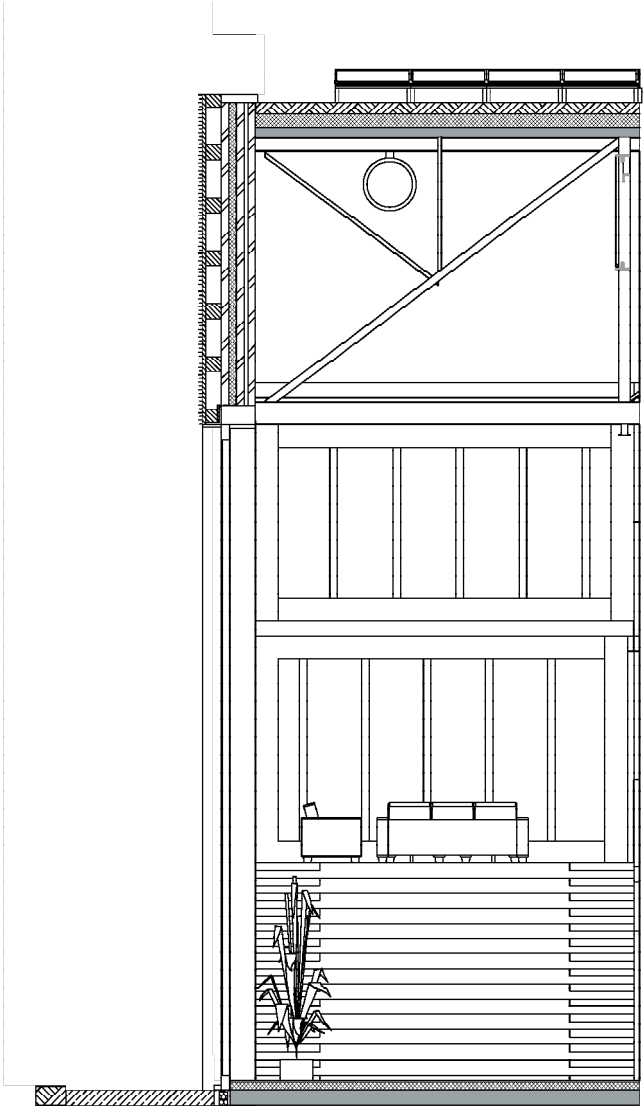




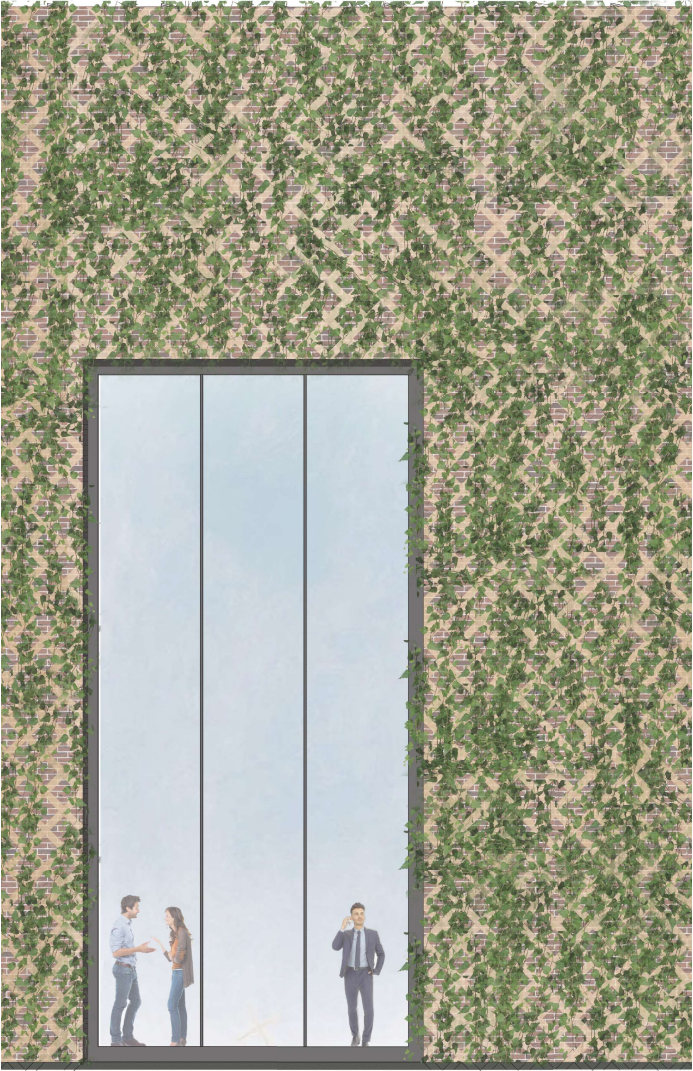




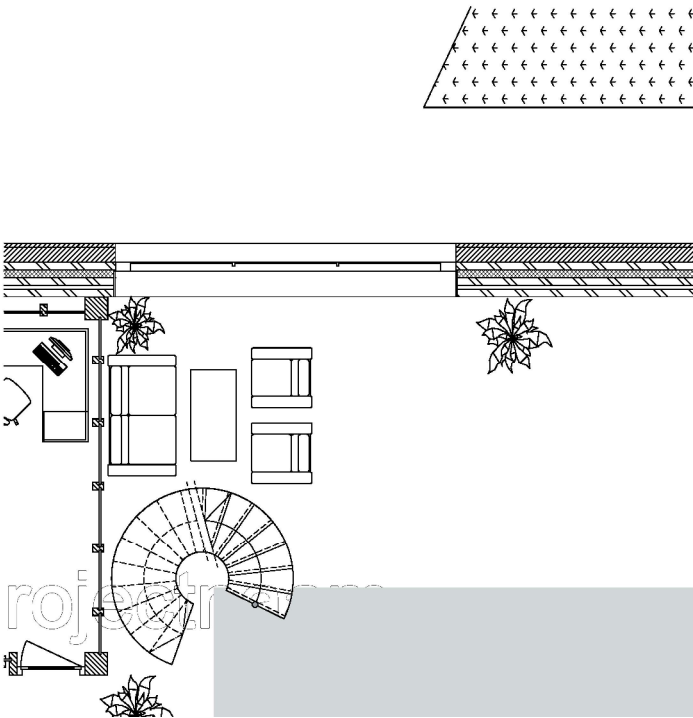
West facade - summer situation



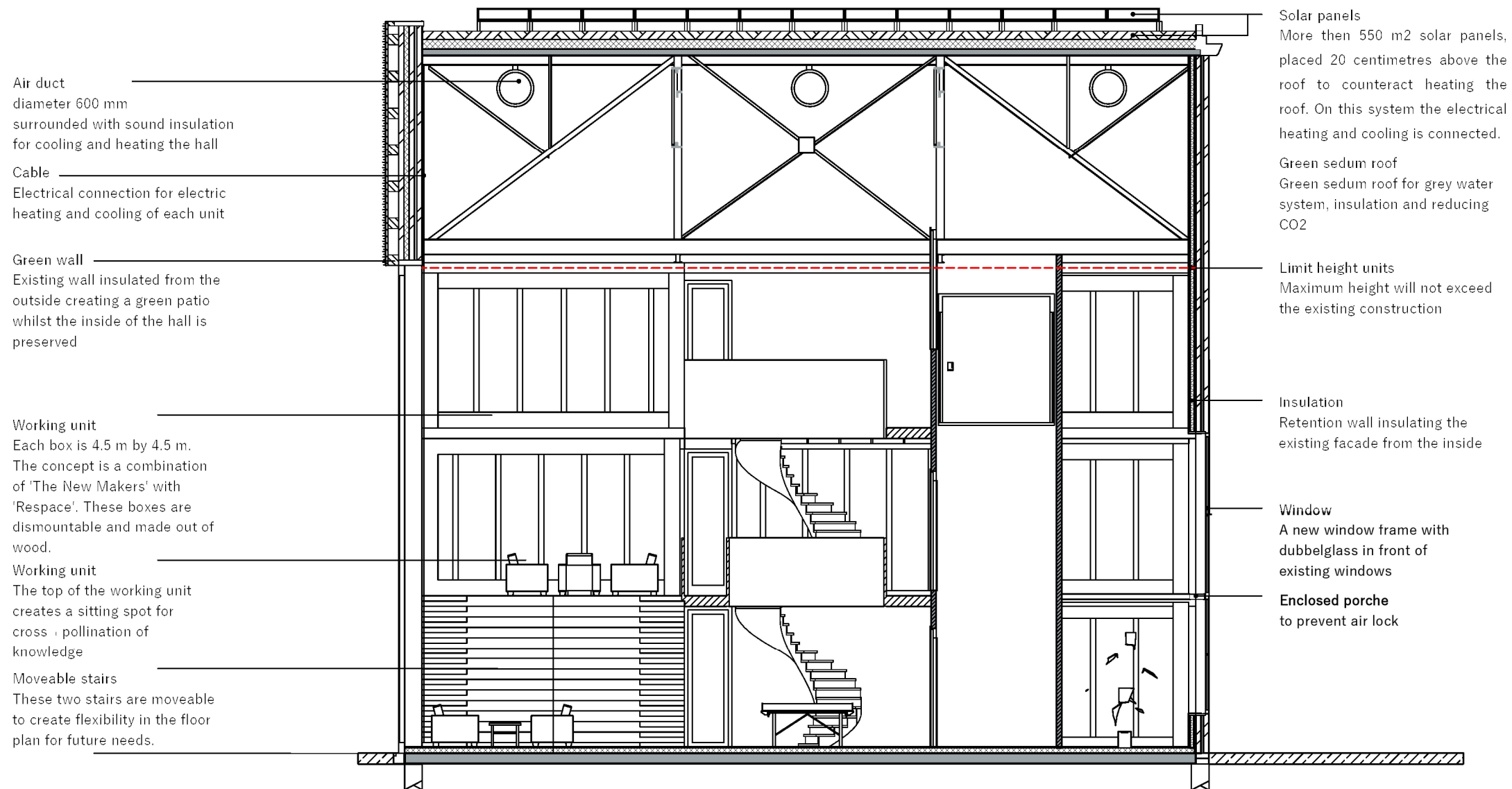
Vertical cross-cut west facade



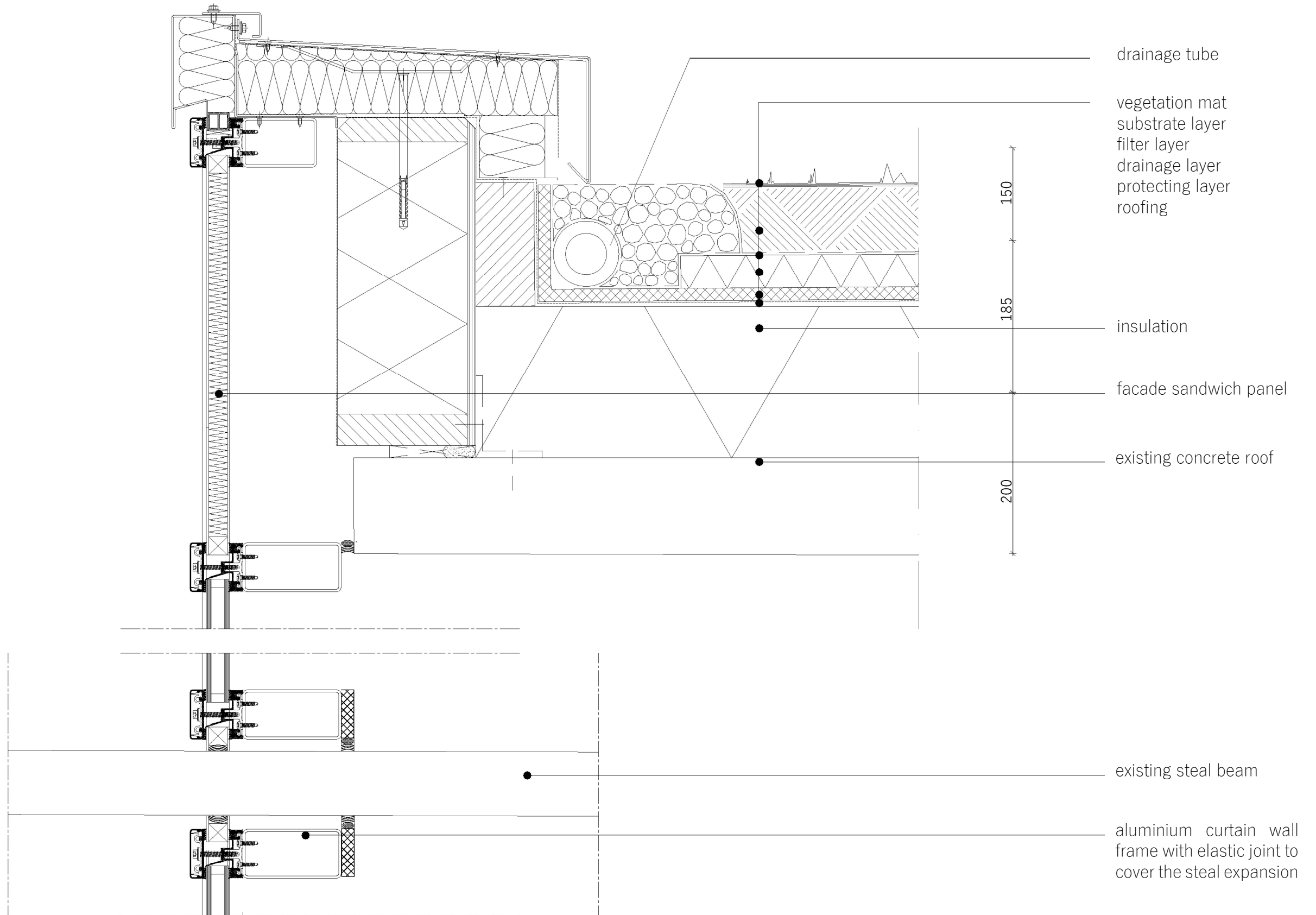
West facade - winter situation



Horizontal cross-cut of ground floor







6

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# APPENDIX

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A

REFLECTION PAPER

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“Heritage 4all: Univer-Cities” is chosen as the graduation studio. The focus of this graduation studio lies on the following four themes: Co-creation, sustainability, univer-cities and digital heritage.

Firstly, as the name of the studio refers to, “Heritage 4all”, the fundamental vision is that stakeholders, people related to a specific project, are involved and that co-creation is the approach of the research phase and used for the design assignment. In other words not only experts (e.g. architects, designers, planners), who are educated for it, would produce and decide over the built environment, but also the general public, who are not experts in the field of planning, design and management, would be taken along in such process of producing the built environment. Citizens values, thoughts and experiences must be taken into account since in the end the citizens use, work, live in the spaces created. This represents the heritage that needs to be preserved carefully. This process of co-creation may raise complicated issues, as the values and attributes, thoughts and experiences can be antipodal.

The second theme of this graduation studio is sustainability. Similarly to co-creation, sustainability in its broadest sense of the word, in combination with heritage can culminate in complicated issues and ethical questions. For example how to deal with heritage values whilst adapting a building to make it energy neutral? Sustainability can also be related to Univer-Cities. “Univer-Cities”, cities with a symbiotic relation with the university hosted, like Delft with its high ranked Architecture education should have an example function for sustainability (Teo, 2013). Furthermore the theme Univer-City also addresses the phenomenon of co-creation; what is the relation between the city and its university? Are they separated or do they work together and replenish each other?

The fourth research theme of the graduation studio chosen is Digital Heritage. It does not only refer to computer-based information that has lasting values for contemporary and the future society (e.g. pictures, movies, figures, websites), but particularly digital games are addressed in this research. (UNESCO, 2009)

The above is linked to the used case study, the Kabelfabriek II. This is part of the 20th century industrial heritage, which is a hot topic in the present architectural transformation projects. Because of the sheer size of the Kabelfabriek II, the first phase of the design process, preliminary design P2, can be considered an urban one. In the second phase the focus shifted to a particular part of the design, in which the building design and technology is addressed.

The relevance of this research lies in the fact that there is still a challenge on how to deal with vacant and obsolete industrial buildings. Heritage that can be considered as crystallized memories of the past or the embodiment of memory should not be demolished, because it is not only sustainable in terms of energy and material use, but also in terms of preserving cultural heritage, whether it is listed or not.

To find out what the state of the art is of the topic chosen, redesigning 20th century industrial heritage together with stakeholders for adaptive reuse, a literature review has been done. The search in literature, revealed that the involvement of stakeholders is of paramount importance, however in most articles the methods and tools in which stakeholders are involved is not highlighted or explained properly. An interesting experiment was conducted by Dr. de Andrade, Poplin and Sousa de Sena (2020) which clearly shows that the use of Minecraft leads to civic engagement, in this specific article children.

Different architectural research approaches are applicable for this research. The research approach is a combination of historical, qualitative, simulation and case studies. Various methods are applied for the research approaches.

The historical approach consists of analysing the historic evolution of the Kabelfabriek II and surroundings through collecting data in (digital) archives. To analyse the Kabelfabriek II fieldwork is done. Pokémon GO, an augmented reality mobile game, is used to explore the existing values and attributes of the building and site in a different way. This approach to fieldwork is aligned with the Theory of the Derive to ensure that the site visit is guided not by visuals but by the gaming mechanics, making it a spontaneous, surprising, neutral and smooth site visit (Debord, 1958). Archives and libraries are visited to collect data for the historical evolution analyses. Besides, desk research about the Kabelfabriek II is conducted in consonance with expert interviews. For example an interview with Ilse Rijnveld, monument advisor at the municipality of Delft and an interview with Theodora Chatzi Rodopoulou about the reuse of industrial heritage.

For the qualitative approach a simulation game and surveys, including interviews, are applied. Through digital gaming models the simulation approach is applicable. The Kabelfabriek II is used as the main case study to answer the different research questions. For the stakeholders’ involvement Minecraft is used as a medium to interact and to find out the needs of the people and what they value. To be able to properly use Minecraft as a simulation tool to communicate with the stakeholders, it is necessary to follow training sessions. These sessions consists of testing the Minecraft game tool for the co-creation design workshop.

Other than Minecraft workshops interviews are done to involve stakeholders. One group of these stakeholders are the people not educated in the built environment. The other group, educated in the built environment, are called experts. Both groups are invited to the final workshop. An example of an expert interview is the one with Anne-Lize Hoftijzer, who is Manager Real Estate Development of the Technical University Delft to find out the relation between the Kabelfabriek II and the TU Campus and how they can reinforce each other. Furthermore, an interview with developers of the Kabeldistrict Amvest and Kondor Wessels Vastgoed and an interview with Georges van Beers, project leader of the Kabeldistrict, is done. A non-expert interview is for example an interview with the former and current inhabitant of the Kruithuis, a monument next to the Kabelfabriek II. Interview protocols were made before the interview was done. Afterwards the interviews were transcribed.

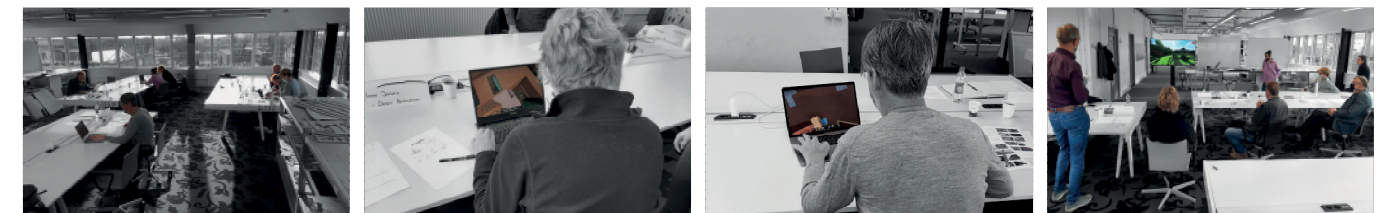


Figure 1,2,3,4. Minecraft workshop with stakeholders of the Kabelfabriek (Tol, 2020)

During the workshop a ‘Values & Attributes’ survey is given to the stakeholders as a supportive tool to get to an values and attributes assessment of the stakeholders. The ‘Values & Attributes’ survey is mainly based on the outcome of value and attributes assessment by the author. The



method of Pereira Roders and Tarrafa Silva (2012) is chosen to follow to get to a values and attributes assessment and to select attributes for the survey.

To create an overview of sustainable design solutions different case studies are looked at. The PhD thesis, entitled 'Control Shift – European Industrial Heritage Reuse in Review', of Theodora Chatzi Rodopoulou (2020) is analysed as some relevant case studies are selected to integrate this research as good design practices. Furthermore expert interviews are done. For example an interview with Theodora Chatzi Rodopoulou, who obtained her PHD on a review on reuse of European industrial heritage. Moreover, Benno Schepers of CE Delft, senior researcher/advisor and leader of the sector sustainable cities is interviewed.

The main communication and simulation tool used was the game Minecraft supported by a values and attributes survey and a floor plan with tracing paper. One can state that the game Minecraft is a proper simulation tool to communicate with the stakeholders. Especially the visualization in the game contributes largely to the civic participation and engagement, especially for non-experts. However the game is too slow for the scope of the project the Kabelfabriek II, since you can only add and remove blocks of 1m<sup>3</sup>. New modifications on Minecraft point to new possibilities of removing and adding more blocks at once. This should be incorporated in future workshops. Therefore a program like Sketchup is a better alternative. Minecraft serves as a basis enabling the participants to form a well-founded judgement on how the Kabelfabriek II should be redesigned, since they gained a better grip on the whole project. It is a powerful tool to communicate design ideas and to negotiate with different stakeholders.

The redesign of the Kabelfabriek II is a result of the outcome of the research done in the first half of the graduation period. The needs, wishes and values of the stakeholders were put together by means of this research. The following four images represent the conclusion of the stakeholders, namely: The stakeholders are not in favour of a lot of high rise. As part of heritage they want to preserve the construction and skin of the old factory, both in length and height. They favour the existing patio and suggested to create more similar spaces. Furthermore they want more greenery. Working and living is considered as the main function of the redesigned factory.

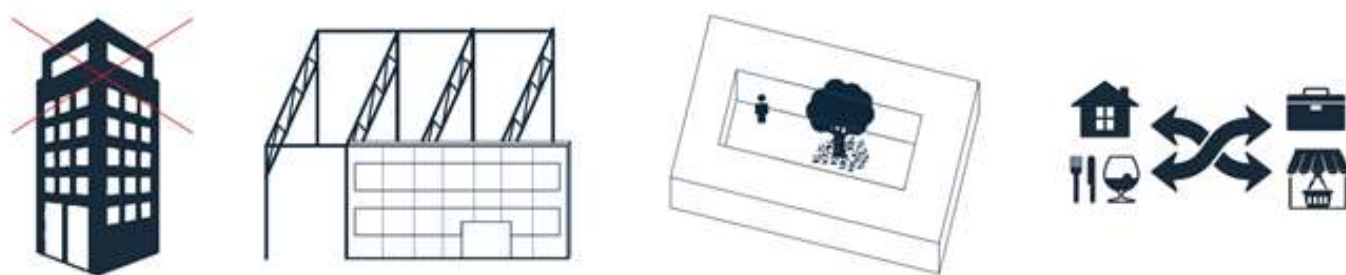


Figure 5. Conclusion of the stakeholders involvement (Tol, 2020)

The feedback given by the mentors was to think out of the box and to avoid standard design solutions. The urban plan was considered to have been worked out well. The relation between the urban volumes and the internal program of the volumes needed some more attention. This is being approached accordingly. By illustrating the different themes in a clearer way the feedback is translated more transparently. The lesson learned is visualizing my design ideas as clear as possible and to design each space as a high quality volume. Another important aspect

of designing dwellings is zoning the floor plans. For P4 the recommendation was to make sections over the whole urban block in order to create a clear overview and to illustrate the relations of each program indoors and outdoors. Visualisations strengthen the concept and show the hierarchy of the different outdoor spaces. For P5 the material concept of the interior spaces is shown in visualisations. Special attention is paid to incoming daylight, the relation with and the outdoor spaces and the relation with heritage. Moreover, a constant need is felt to focus on alternative solutions and the argumentation of the individual choices made.

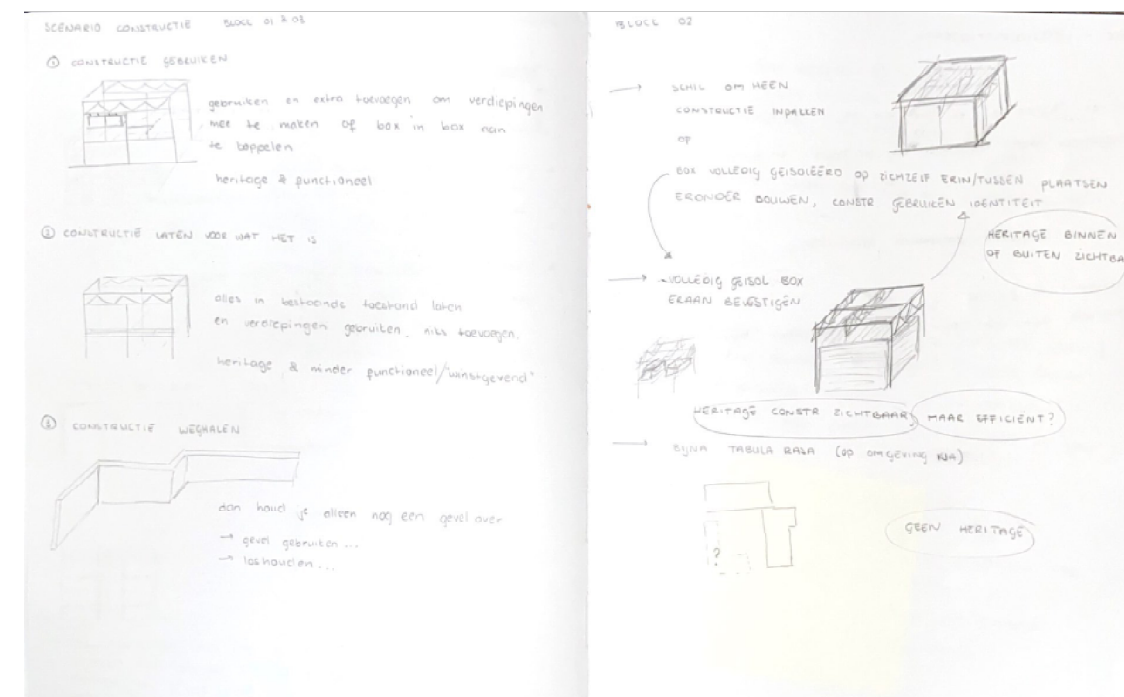


Figure 6. Designing with alternatives (Tol, 2020)

Lastly, the lesson learned from this graduation project and the feedback received from my mentors that it is of paramount importance to show my ideas on paper even if they have not yet been worked out completely. When presenting my design it is crucial to stand behind my design as a craftsman.





KABELFABRIEK 2.0