







## Introduction

This document is made as part of the Masters 3 graduation studio Heritage and Architecture: Revitalising Heritage. The specialisation of the graduation is the Hembrug area in Zaandam and will focus especially on the Changing zone ensemble of the Hembrug area. It is recommended to read the document "The Changing zone of Hembrug" first, this in order to obtain enough background information. Among other things, this document answers to the main research question: "What is the coherence in the Changing Zone?". The design question of "How to deal with the coherence between social inclusiveness and the Changing zone?" is still relevant in this document and will be elaborated further on.

In this document, several points will be discussed. Firstly, the choice of the target group will be discussed, after which the target group will be looked into in depth. This in order to meet their demands and to understand their needs. In this way, a thorough design brief can be composed.



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*"Het is de kunst van het ouder worden om de problemen niet te ontkennen, niet vast te willen houden aan levenswijzen die niet meer goed passen bij je veranderende situatie, maar je ook te onttrekken aan de ingeburgerde vooroordelen en zoveel mogelijk je leven te blijven leven".*

Het nieuwe ouder worden - Jan Baars

Source: Own illustration

Target group

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## Geef ouderen hun stem terug!

geefouderenhunstemterug.nl

Twee jaar woonden wij, jongeren, tussen de ouderen in verzorgingsgeboren project was uniek: twee generaties die normaal niet bij elk-buren samen.

In die twee jaar hebben we gezien wat er misgaat in de ouderenzor-de ouderen. De problemen van Tuindorp-Oost kenmerken meer zorg. Daarom dit manifest, om onze ervaringen met onze ouderen te del

### 1. Het gaat om de kwaliteit van leven, niet alleen om

In Tuindorp-Oost leidde het inspectiebezoek tot meer checklists, ov-trainingen, zodat voldaan kon worden aan de inspectie-voorwaarde-kwaliteit van zorg, maar wordt de kwaliteit van leven vergeten. Niet de ouderen wat ze willen, hoe ze de zorg ervaren en neem dat net: inspectierapport. Goede zorg is meer doen dan het strikt noodzakel voor zijn.

### 2. Geef de ouderen hun stem terug

Daarom is het belangrijk om naar ouderen te luisteren. Zorginstellir van met ouderen wat het beste voor hen is. Onze ervaring is dat ou worden bij beslissingen goed kunnen meedenken. Luister daarom g ook zelf bepalen hoe je leeft, eet, verzorgd wordt en wanneer (en o

### 3. Geef de zorgmedewerkers hun verantwoordelijkheid

Niet alleen naar ouderen, ook naar zorgmedewerkers wordt niet gel-ervaringen leidend moeten zijn. Ouderenzorg bestaat uit meer dan beleidsstukken. Iedere oudere is uniek en hun verzorgenden kennen verantwoordelijkheid daarom bij zorgmedewerkers.

### 4. Bestuurders, wees betrokken bij de ouderen, naast

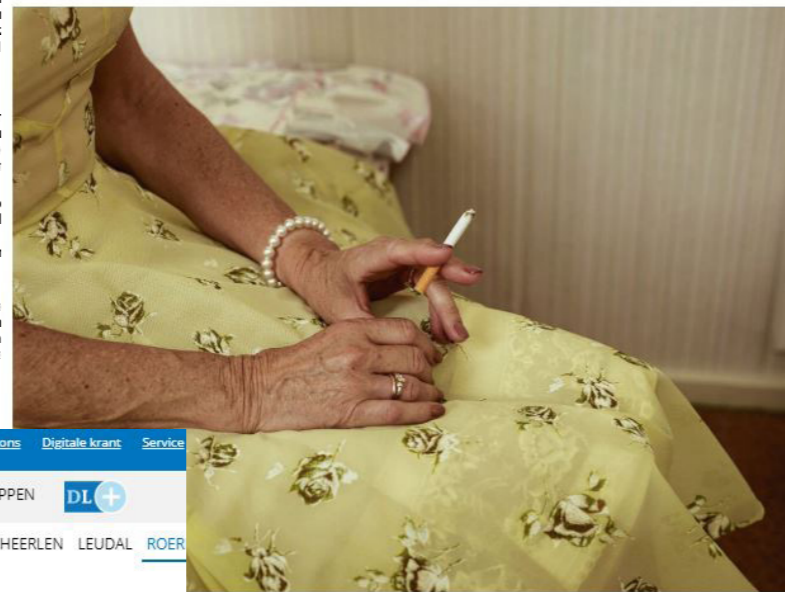
Bestuurders staan ver weg van de realiteit in de zorginstellingen. In managers uitleggen dat alles wel in orde was, terwijl de onvrede va Bestuurders weten niet precies wat er speelt, toch bepalen zij het z bestuurders weer in contact komen met medewerkers, ouderen en misgaat.

### 5. Zorg voor een lange termijn visie

## Denk ook eens aan je oma

**Isolement** Vooral onder ouderen is eenzaamheid een probleem. Een maandelijks kaartje kan al helpen, of de zorg voor een huisdier.

Michiel Dekker 25 juni 2017



Deze foto's zijn van het project Not seen van Annabel Oosteweeghel. De afgebeelde mensen zijn modellen.

Leuke studie, mooi weer, lekkere soep. Veel meer had Wilbert van de Kamp drie jaar geleden niet te bespreken met zijn oma. Hoe zou hij voor elkaar kunnen krijgen dat ze elkaar beter leren kennen?

Die vraag is het begin geweest van de app 'Omapost'. Het idee: stuur elke maand een persoonlijke kaart naar je oma of opa. „De generaties van oma en kleinkind verschillen enorm. Wij zijn druk, leven veel online en gaan weinig langs. Dat kan ouderen een eenzaam gevoel geven. Een kaart is een kleine moeite, maar je vereenvoudigt en verdiept je relatie.”

## De Limburger

Tip ons Digitale krant Service

NIEUWS REGIO SPORT LIFESTYLE VIDEO NICKY VERSTAPPEN DL+

NOORD-LIMBURG MIDDEN-LIMBURG ZUID-LIMBURG MAASTRICHT HEERLEN LEUDAL ROER

## Roermond wil eenzaamheid bij ouderen voorkomen met kunst en cultuur

Gisteren om 16:17 door Gertie Driessen

Print



Afbeelding: iStock



**Dans, zang, toneel, schilderen.** Cultuur kan bijdragen aan van ouderen. Roermond wil daarom de deelname van sen en cultuur bevorderen.

Een samenleving waarin iedereen mee kan doen. Dat is één het coalitieakkoord van Roermond.

### Eenzaamheid

Had de gemeente al het predicaat dementievriendelijk, de k wil ze zich inzetten om ook een seniorvriendelijke stad te w wil de gemeente onder meer de deelname van ouderen aan cultuuractiviteiten bevorderen en voor een groter aanbod zorgen.



who cares

## prijsvraag

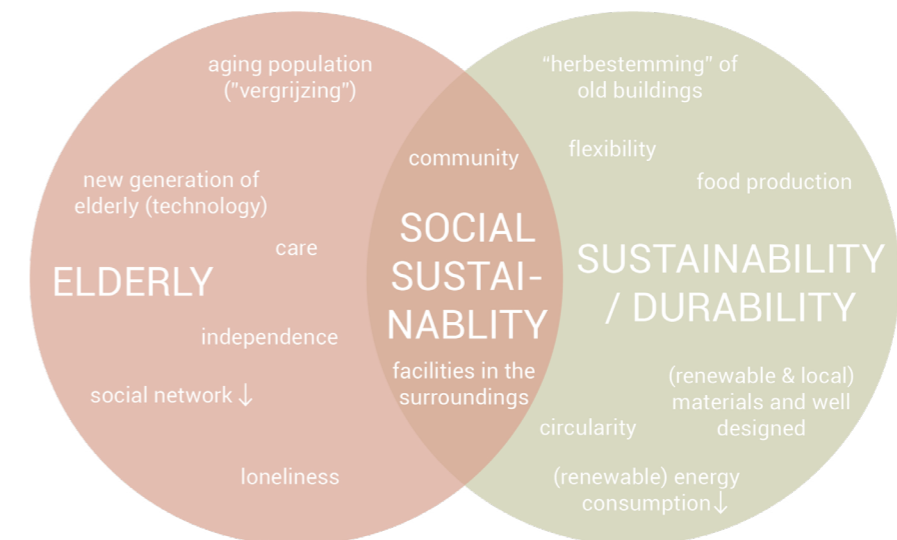
Gezocht: innovatieve en toekomstgerichte visies op de Nederlandse woonwijken, die antwoord geven op de vergrijzing en de veranderingen in de zorg en ondersteuning; nieuwe ideeën die een impuls geven aan de ruimtelijke vernieuwing van de wijken.

Rijksbouwmeester Floris Alkemade: "Een stad die goed is ingericht voor mensen die zorg en ondersteuning nodig hebben levert een betere stad op voor iedereen"

## Relevance

The different media, of which a couple are selected, show the relevance of this topic. The loneliness of the elderly, a still growing problem, due to the rising number of elderly. The government recognises this problem and provides more money. Local governments have their own ways of dealing with this issue and sometimes work together with (smaller) organisations.

The care need of the elderly is a very present topic in society. By choosing elderly people with a physical care demand, who can't stay at their current homes, as target group in my project, I hope to contribute to solving this social problem.





## Target group

As described in the previous chapter, the number of elderly is growing and will keep on growing in the future. The division of living and care results in new housing requirements and different care demand. A need has risen for new forms of housing for the elderly. The care demand of these elderly people varies from person to person. Vital elderly, for example, do not feel old and usually have no need for care. However, they are preparing for a future in which they become older and have different care needs. The needs, wishes, and possibilities in living and care vary and require a diversity in housing types, something that can be tailor-made. Elderly want to live independently, but they want easy accessibility to care and facilities in their proximity. A city that is suitable for the elderly is suitable for everyone.

But what if a home can no longer be made future-proof and the older needs care? Then a new form of housing will have to be looked into. For this, I am introducing a care home 2.0:

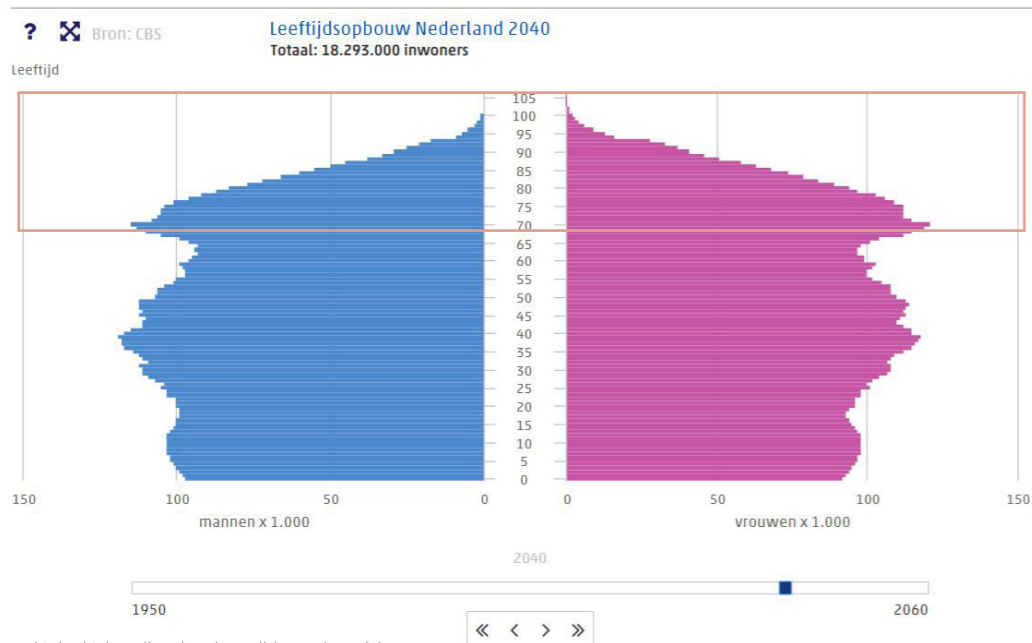
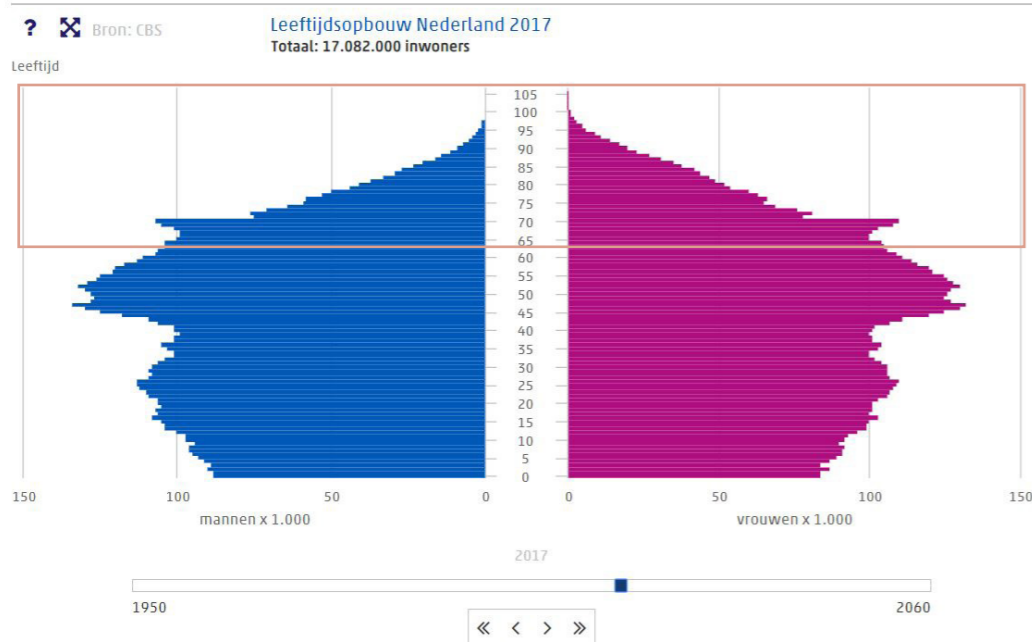
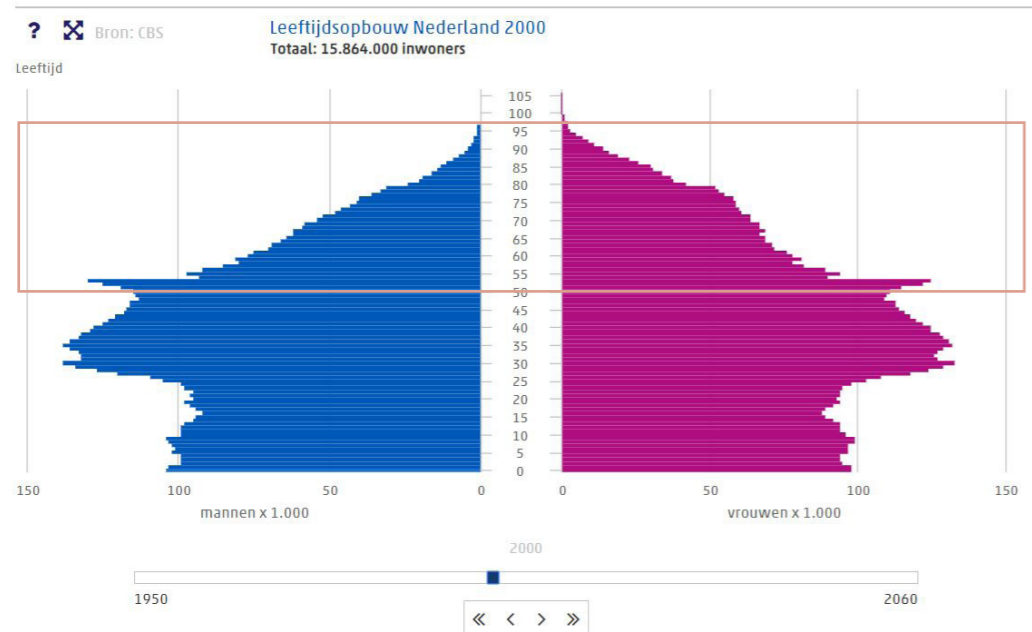
*Huize Hembrug an elderly community complex for the elderly with a physical care demand.*

Another problem that Huize Hembrug can solve, is the loneliness among elderly people. The "Sociaal en Cultureel Planbureau" writes that decreasing the loneliness of the elderly is impeded by the fact that the number of old people is still increasing (vergrijzing). Although the individual likelihood of loneliness has dropped over the past 20 years, this fall is too small to stop the number of lonely people from rising in absolute terms. Longterm (feelings of) loneliness can cause health problems, withdrawel from society and a lower quality of life (with an increased risk of health problems). Loneliness is related to age and to a certain extent to the degree of satisfaction, the quality of life (happiness, lust for life, etc.).

The designated cause of the origination of loneliness (among elderly) is a smaller social network, health issues (both physical and psychical complaints) and the experience of loss of control over life. Loneliness occurs particularly during the second half of the life cycle, among elderly, and does not have one single cause. It has multiple causes, and these can reinforce or counteract one another. Life events cannot be prevented, such as the loss of a partner or a serious illness. These dramatic life events increase the risk of loneliness. The core of loneliness is often the dissatisfaction with the social network.

A trend to be reckoned with, is the increase in both the number of elderly living independently and their sense of control over life. This reduces the chance of loneliness.

Improvements in social contact will contribute to a decline in loneliness, but also being admitted to a care home can help and decreases the risk of loneliness. Social-cultural activities that improve both socialising cognitive activities can help give meaning to people's life. Participating in artistic or sporting activities, for instance, can both contribute to overall happiness and help to prevent loneliness in different ways.



Source:  
<https://www.cbs.nl/nl-nl/visualisaties/bevolkingspiramide>

## A new generation

The elderly of today are not elderly people then they used to be. They live a longer active and independent, and sometimes work longer as well. Their perception has changed: they are more aware of being old, and how they can stay healthy. They want to stay involved in society. Older people want to keep their own control over their lives.

Twenty years ago, people were old when they were above 50 years old. This line of when people got called old moved up with already 10 years. This is also due to the rising life expectancy. The trend is that in the coming 10 years this line will move even further. At the age of 50, one will not be called old but will be at the fertile middle of life.

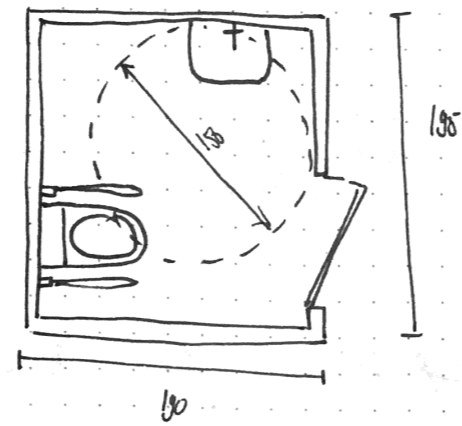
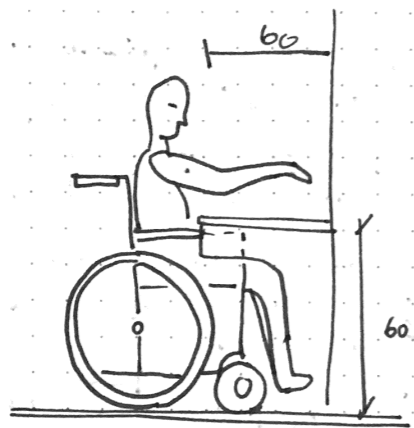
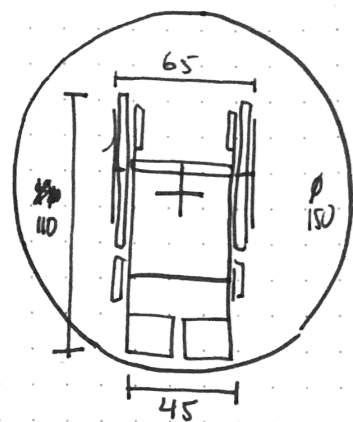
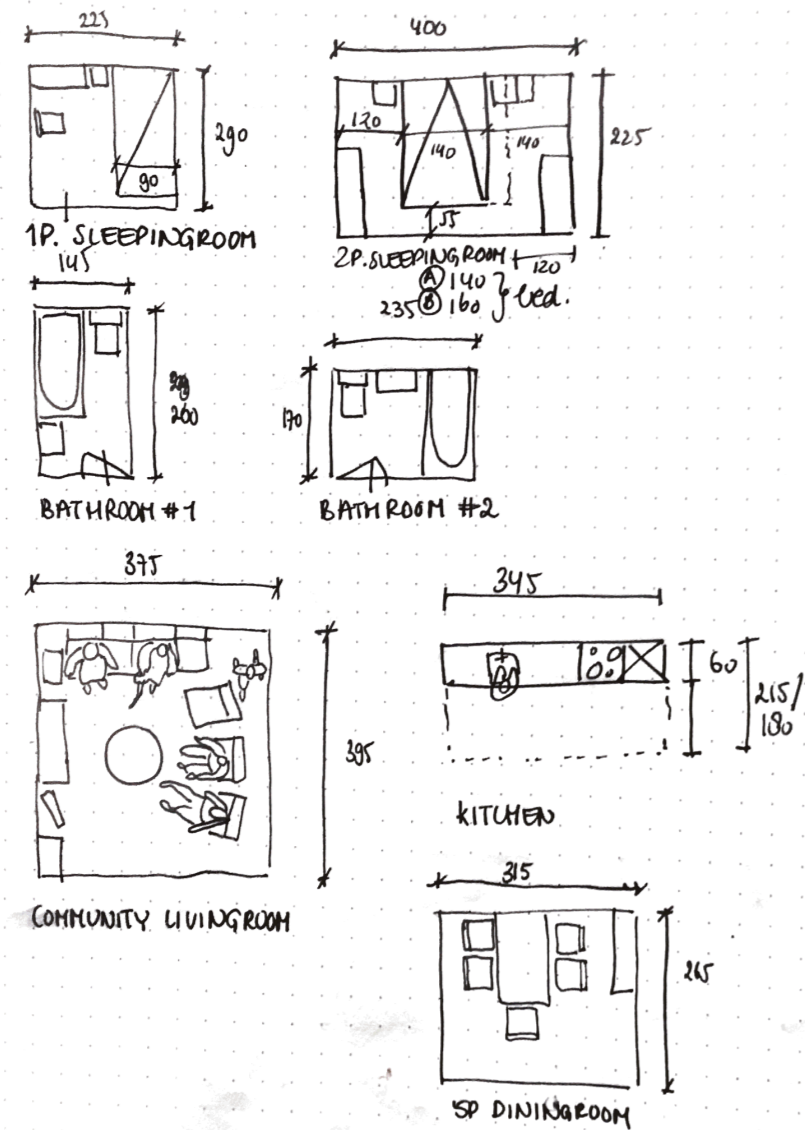
This new group of active elderly people, therefore, has a different (housing) need. They follow a new trend and want to live independently for as long as possible and want to have the possibilities to arrange care for themselves. The wish to live independently longer has as a consequence that their homes need to be changed. This also means more need for domestic help and personal care. When this change is not possible, rehousing in the close surroundings near their social network and facilities is preferable.

Another trend of this new generation of elderly is their wishes and possibilities regarding technology. Especially if making use of domotics technology (things like a stairlift, personal alarm, night path lighting, automatic curtain control, and lighting, sensors (in activity measurement and fall detection) and camera surveillance) en ICT technology (things like electronic medical dossier and video communication) means that they can live longer on their own. This is something the new generation of elderly is already very well acquainted with. The internet helps them to keep up their social network. Approximately 90% of the new elderly (now between 55-65) is active on the internet and half of them uses social media, while above the age of 75 this is only 30%.

Finally, the group (new generation of) elderly is not one uniform group, but they differ widely in their wishes, needs and potentialities. A large part of their wishes and needs will overlap, but each individual also has its own struggles and needs.

Source:  
<https://www.zorgvoorbeter.nl/>  
Doekhie, K. (2014). Ouderen van de toekomst. Verschillen in de wensen en mogelijkheden voor wonen, welzijn en zorg. Nivel: 2014.





## Designing for elderly

The housing requirements of the elderly is something that is already discussed to some extent in the previous paragraph and will be elaborated on further.

### Accessibility inside

Walking up and down the stairs is something that really soon gets difficult for older people. A zero step home or apartment ('nultredewoningen') without any stairs can offer the solution. If there is a high difference in the design, a lift or a stairlift can then provide the solution. To make the homes of the elderly even more accessible, it is important to lower the thresholds, both inside and outside.

### Accessibility outside

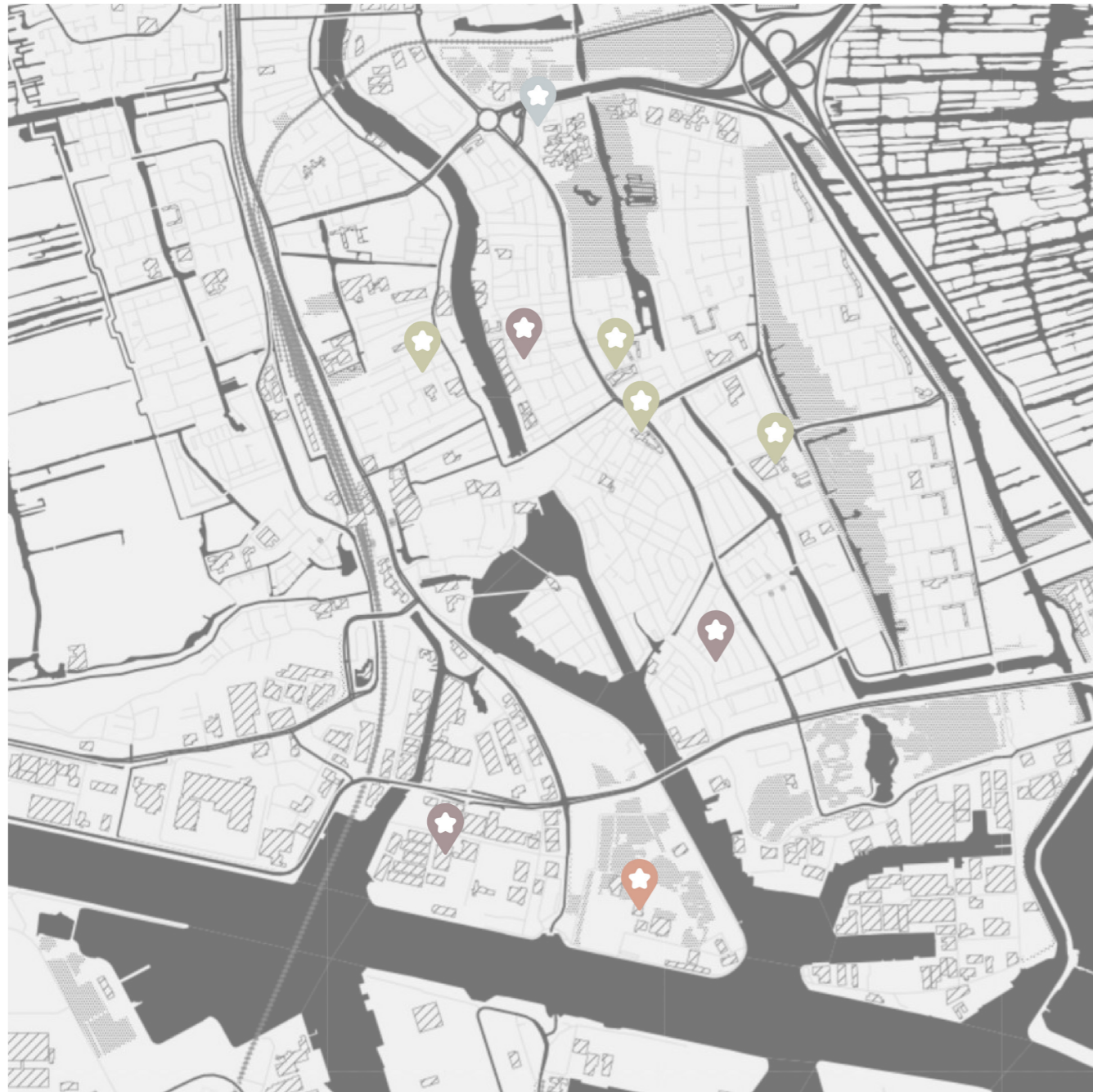
Already mentioned before is the proximity of facilities, like supermarket, hairdresser and pharmacy. Accessibility also means to have an equalized pavement of the outside terras and a path through the garden.

### Technology

Technology is something which is already pointed out. It is about light sensors, personal alarm, automatic curtain control, night path lighting, and digital medical dossiers. It is also about automatic door release, remote control and charging points for the mobility scooter.

### Measurement and sizes

Elderly people generally need more space to move. This is due to the fact that they use a rollator, a wheelchair or a mobility scooter. This has its effect on the size of the doors and turning circles. The furniture of an elderly home can also vary from 'normal' ones. Examples of this are shower chairs, raised beds and chairs, raised toilet edge, relax chairs for an afternoon nap, etc. The use of the kitchen will also be different and therefore a lowered kitchen can be a solution (e.g. in case of an elderly in a wheelchair).




Source: Own illustration, with underlayer of <http://mapstack.stamen.com>

## Program in the surroundings

In the surroundings of the Changing zone, different related functions can be found. Setting up an Elderly Community Centre asks for functions like a hospital (Zaans Medisch Centrum) in the neighborhood. It is also useful to have a closer look at other community centers and see what their target group is. For example 'BIJBIND', located near the Changing zone at the Hembrug area, functions as a second living room. It is the place for a cup of coffee, for a nice meeting, to get inspiration or to sit quietly. BIND also organises events and is run by volunteers and charity. Outside the Hembrug area, there are more community centres as well as elderly homes and care centres.

-  Changing zone
-  Community centre
-  Elderly home/care centre
-  Hospital





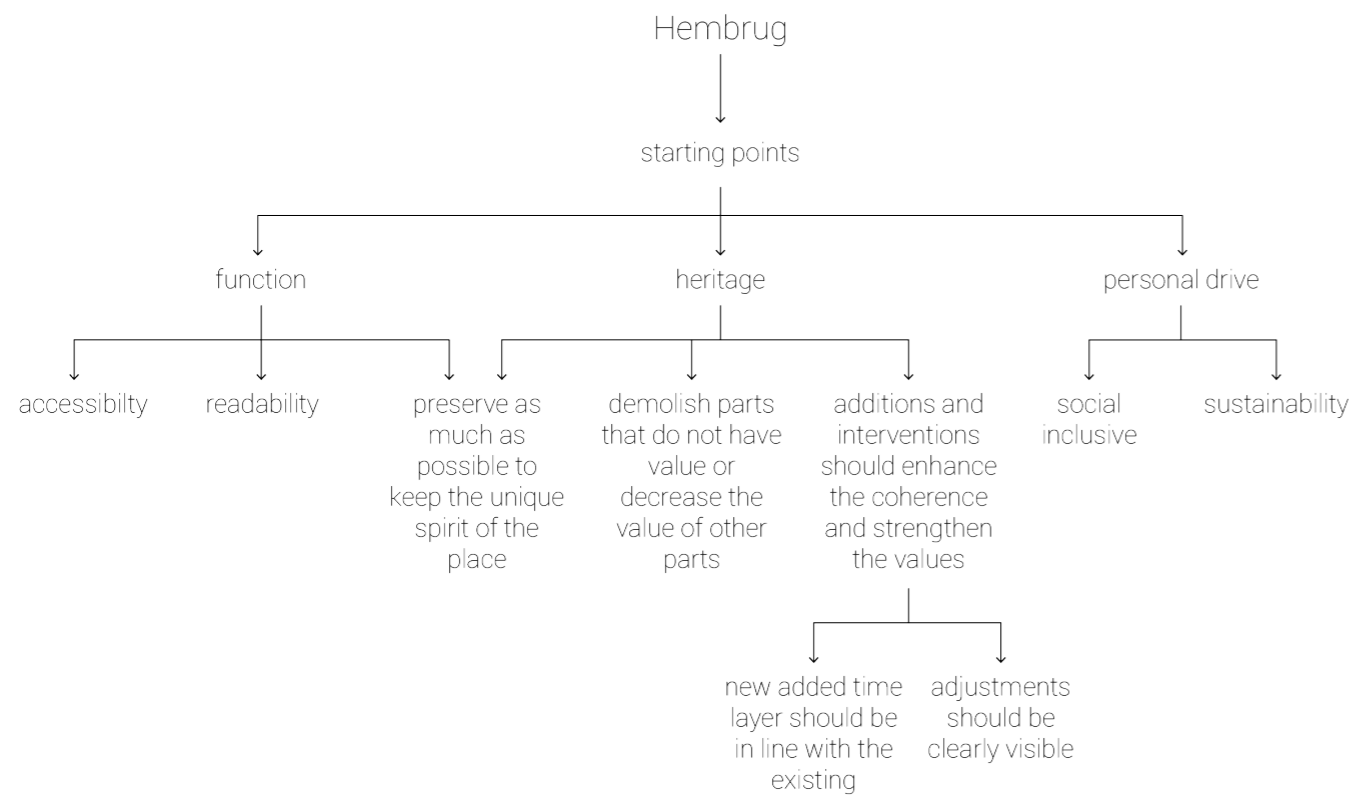
*"The vernacular, somehow imperfect character of the existing, should be the starting point to develop a line of intervention, using the solutions found in the past for making the existing durable, sustainable and suitable for living a modern life".*

Durable past -  
Sustainable future

## Design brief

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## Starting points

The starting points for the Changing zone of Hembrug can be divided into three pillars: starting points specially focussed on the function and the target group, starting points in relation to the taken heritage position and starting points from my personal drive.

### Function



accessibility



readability



'spirit of the place' /  
unity in diversity

The starting points focussing on the function and target group are design assignment specific. A complex designed for elderly starts with accessibility, designing for elderly with a physical care demand means literally and figuratively no thresholds. Readability is focussed on logic and structured wayfinding. Thirdly keep the spirit of the place, by preserving as much as possible.

### Heritage



preserve as  
much as possible



demolish as  
less as possible



enhance &  
strengthen values

The heritage specific starting points are mainly about preserving as much as possible and only demolishing parts when they are low valued or if they decrease the value of others. When adding new additions they should strengthen the coherence and the values. These new additions should be in line with the exiting fabric and adjustments should be clearly visible.

### Personal drive



social inclusive

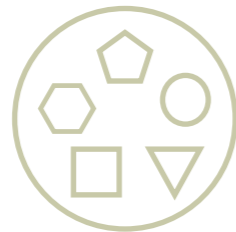


sustainability

The starting points regarding my personal drive start with focussing on a social problem and finding a solution. In this specific case: social inclusiveness, which is twofolded: the entire Hembrug area will be social inclusive and integral accessible and the functions in the residential complex are open for everyone. Lastly sustainability, designing for the future



living environment for elderly with a physical care demand



social inclusive



cathedral as centre of the Changing zone and Hembrug

## Concept 'Huize Hembrug'

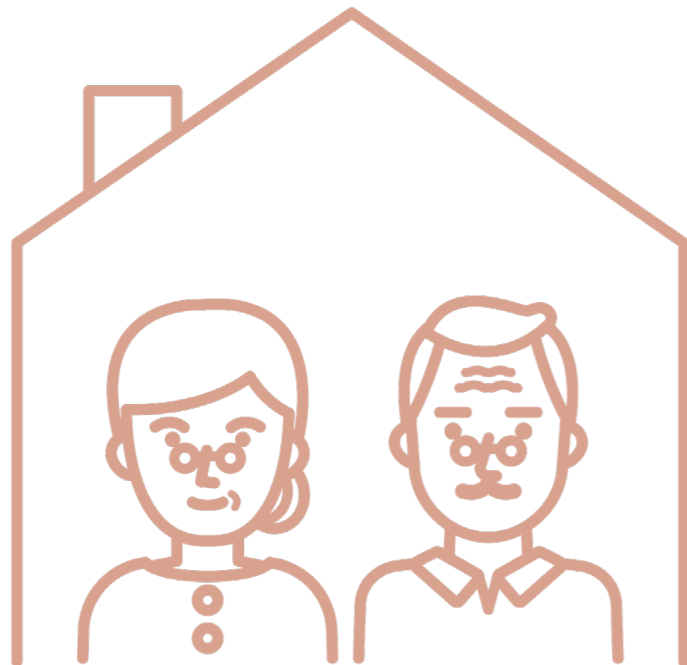
Creating a new living environment for elderly with a physical care demand and who can't stay in their current home. In the concept the residents and the residential complex will be part of society.

'Huize Hembrug' will be social inclusive and the inhabitants will stay part of society. This social inclusiveness is twofolded: the entire Hembrug area will be social inclusive and integral accessible and the functions in the residential complex are open for everyone.

With the cathedral as centre point of the ensemble, it will be literally and figuratively the centre of Hembrug. The cathedral will be the living room of Hembrug and should be approachable by everyone. It should embrace people from outside the complex.

This led to a program of requirements which is twofolded. On one hand the program of recommendations on the entire Hembrug area, and on the other hand a program of requirements for the Changing zone ensemble.





## Program of requirements Community Complex

### General

- Integral accessibility (no thresholds)
- Automatic (wide) doors
- Wheelchair accessibility
- Toilets for disabled people (public)
- Facilities nearby
- Integrated technology / domotica
- Opportunities to meet people

### Supportive

- Reception / Staff / Management
- Laundry (service)
- Scootmobile storage
- Repair service
- Opportunity to receive visitors

For elderly people, it is important to stay busy, be encouraged to do things themselves and participate to meet other people. They can do so by taking part in different kinds of activities, such as:

- Art practice (painting, drawing, writing, etc.)
- Sports activities (dance lessons, walking club, elderly gym, etc.)
- Volunteer work
- Church visit
- Buddy projects
- Walking together through the garden / or the care of a (kitchen) garden
- Going to a performance or restaurant (with other people)
- Different types of courses (cooking classes, music groups, etc.)
- Reading table

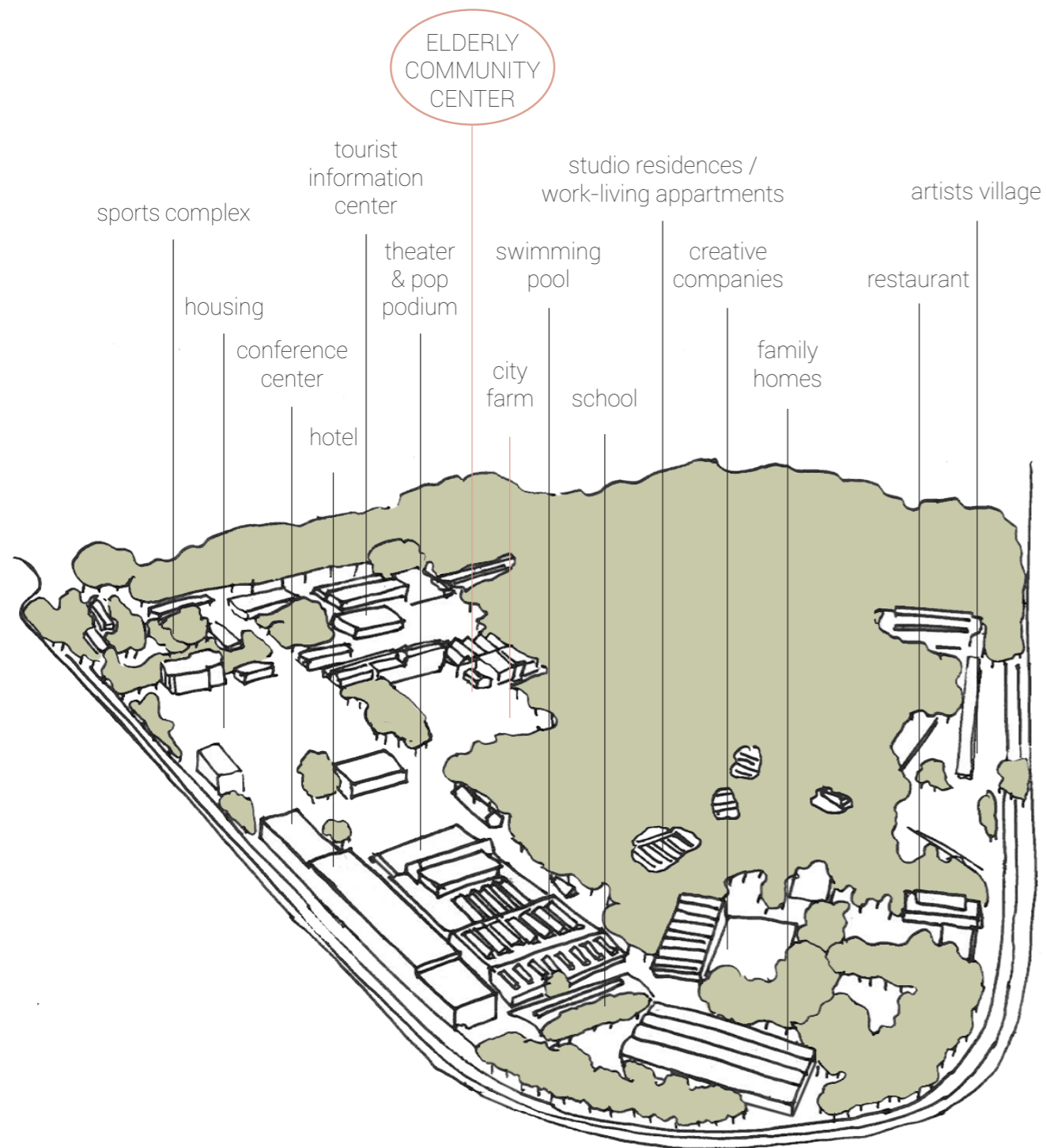
These activities can be organised for them or by themselves for other people.

Next, to that, it is important to have support functions in the neighbourhood to increase further independence:

- Hairdresser
- Physiotherapist
- General practitioner
- Nurse
- Supermarket
- Restaurant/bar

These supporting functions can be open to all residents of Hembrug

Another point worth monitoring is that these elderly people are in the last phase of their life and they have to deal with the passing away of several friends and relatives. It is important that they get support in grief as well as support in the last phase of their life (hospice).



## Program of recommendations

The Huize Hembrug elderly community center will be integrated into society. The Hembrug area is the perfect location to house different groups of society, from students to families with children and from young entrepreneurs until elderly. The Hembrug area is a multifunctional terrain.

For the elderly at the community center, on one hand, it is important to have facilities very close, inside the complex. These could be for example; a supermarket, restaurant, hairdresser and a pharmacy. The facilities at the community center could also be open to different users of the Hembrug area.

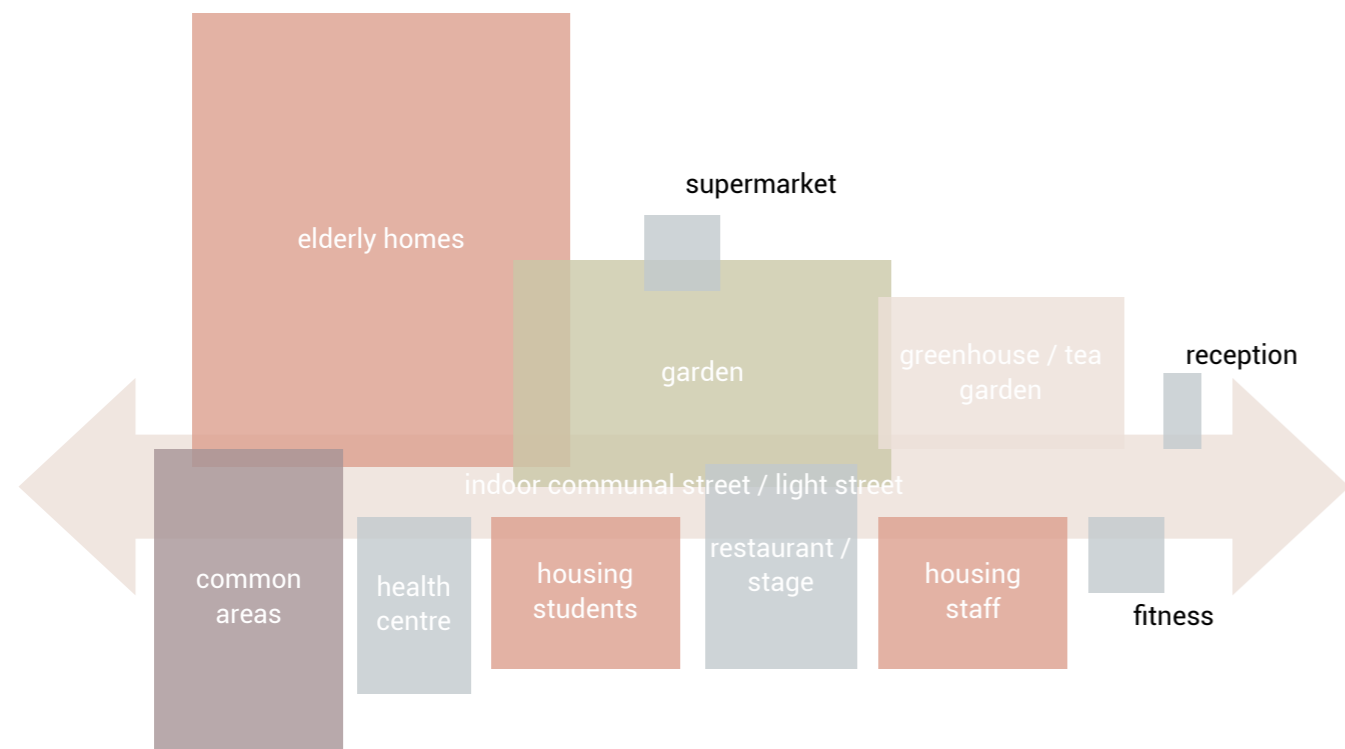
On the other hand, other facilities in the neighbourhood with a primary purpose for the other residents of the Hembrug area, could also be used by the elderly. In this way, isolation of the elderly will be prevented and they will be part of society. Facilities for the wider public that can be considered are a library, a petting zoo/city farm, and a swimming pool.

## Requirements

- Social inclusive
- Integral accessibility (no thresholds)
- Car-free
- Friendly roads for disabled people
- Facilities accessible for disabled (big toilets, lifts, etc.)

The elderly complex should not stand on its own but should be integrated into society.





## Program (m2)

### Housing:

- Elderly homes 3.000 m2
- Housing staff 500 m2
- Housing students 500 m2

### Entertainment:

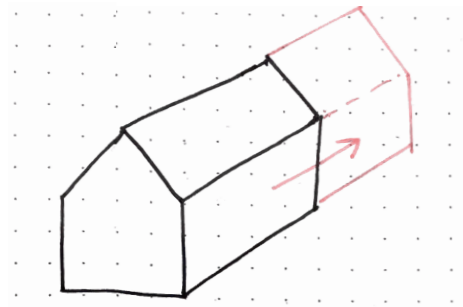
- Restaurant/stage 540 m2
- Reception 50 m2

### Supporting functions:

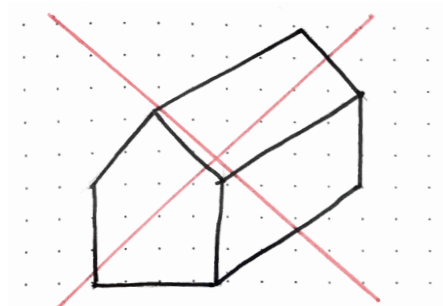
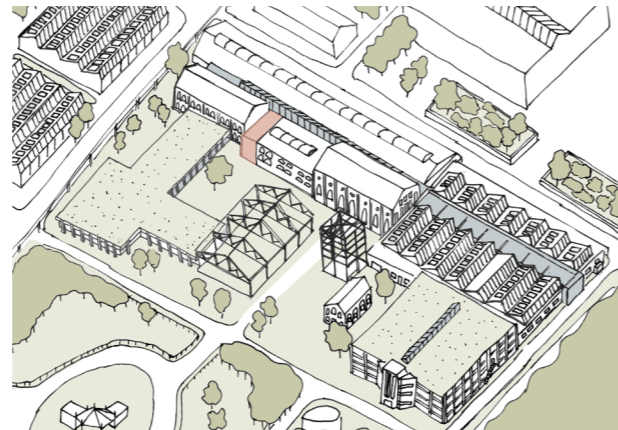
- Supermarket 100 m2
- Health centre 350 m2
- Fitness 100 m2
- Common areas 1.000 m2

### Other

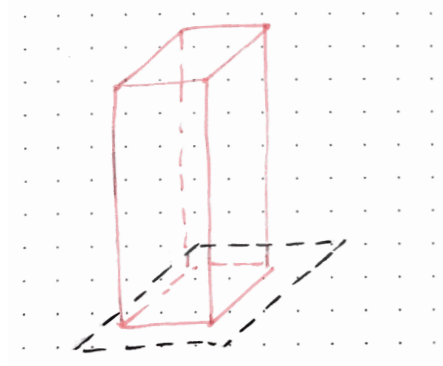
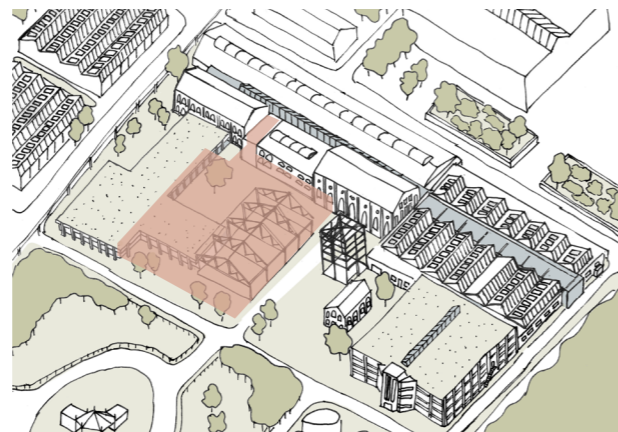
- Indoorstreet 2.150 m2
- Greenhouse / tea garden 650 m2
- Garden 1.500 m2



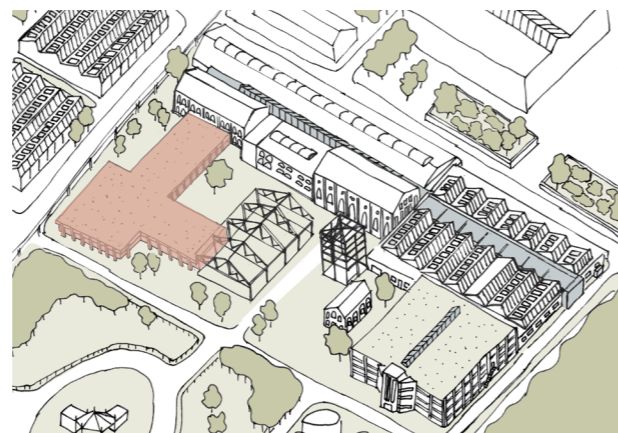
extension



demolition



new construction

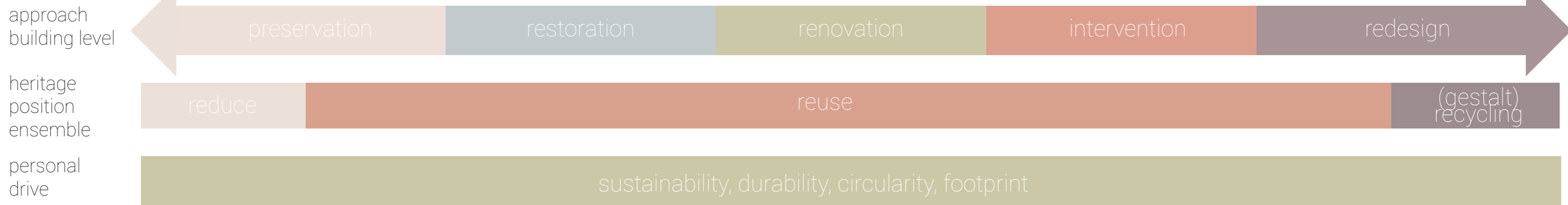


## Transformation strategies

Originally the Changing zone was made in a functional approach and over time it got changed a lot. A special exchange emerged in the density of the ensemble. When production started growing, buildings that were seen as unfunctional were demolished and often the newly created open space was filled with new buildings.

Now the function, will be 'Huize Hembrug' a community center for elderly with a physical care demand. Repeating the steps that were used in history and keeping the (heritage) starting points in mind, resulted in my heritage position. Dealing with the existing can take place in three different ways: reduce, reuse and recycle (Petzet, Heilmeyer and Overmeer, 2012). My main focus in the Changing zone ensemble and the Hembrug terrain is on 'reuse'. This alongside with reduce: firstly, by looking what is already present and what is of value without alteration leads to the new framework. Elements that do not meet the requirements of the framework will be demolished and recycled as much as possible. The new programme function and target group erupted from the social necessity to give home to fast growing group of elderly people with a physical care demand. This differs from the original function of the ensemble: industrial production place. In my personal opinion this new programme has also to meet up with the need for building in both a sustainable and in an (social) inclusive way









*"There is no standard solution for a good intervention. Starting point for the new development are the existing qualities".*

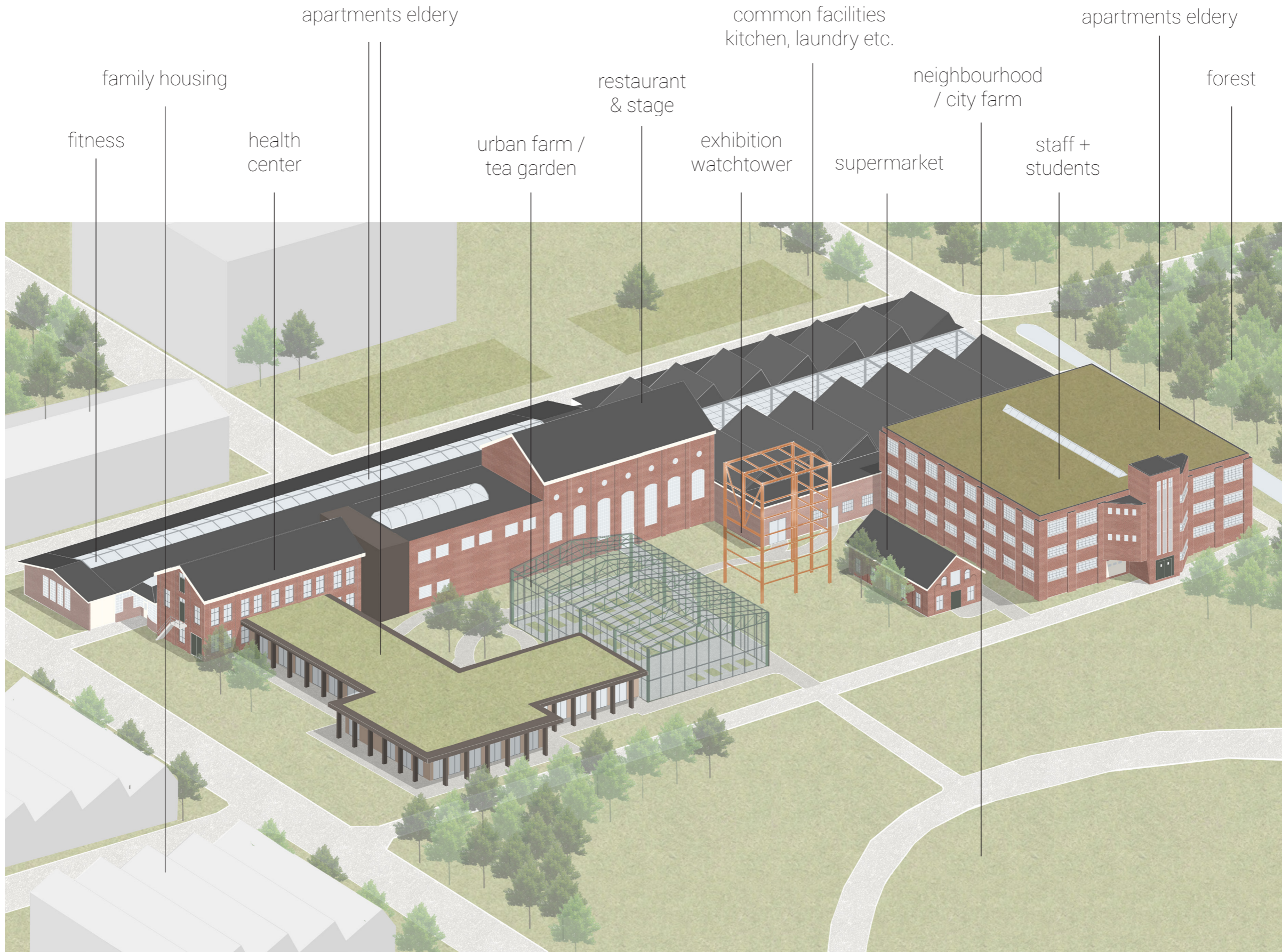
Heritage-based design

## Design

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"How to deal with the coherence between social inclusiveness and the Changing zone?"





program





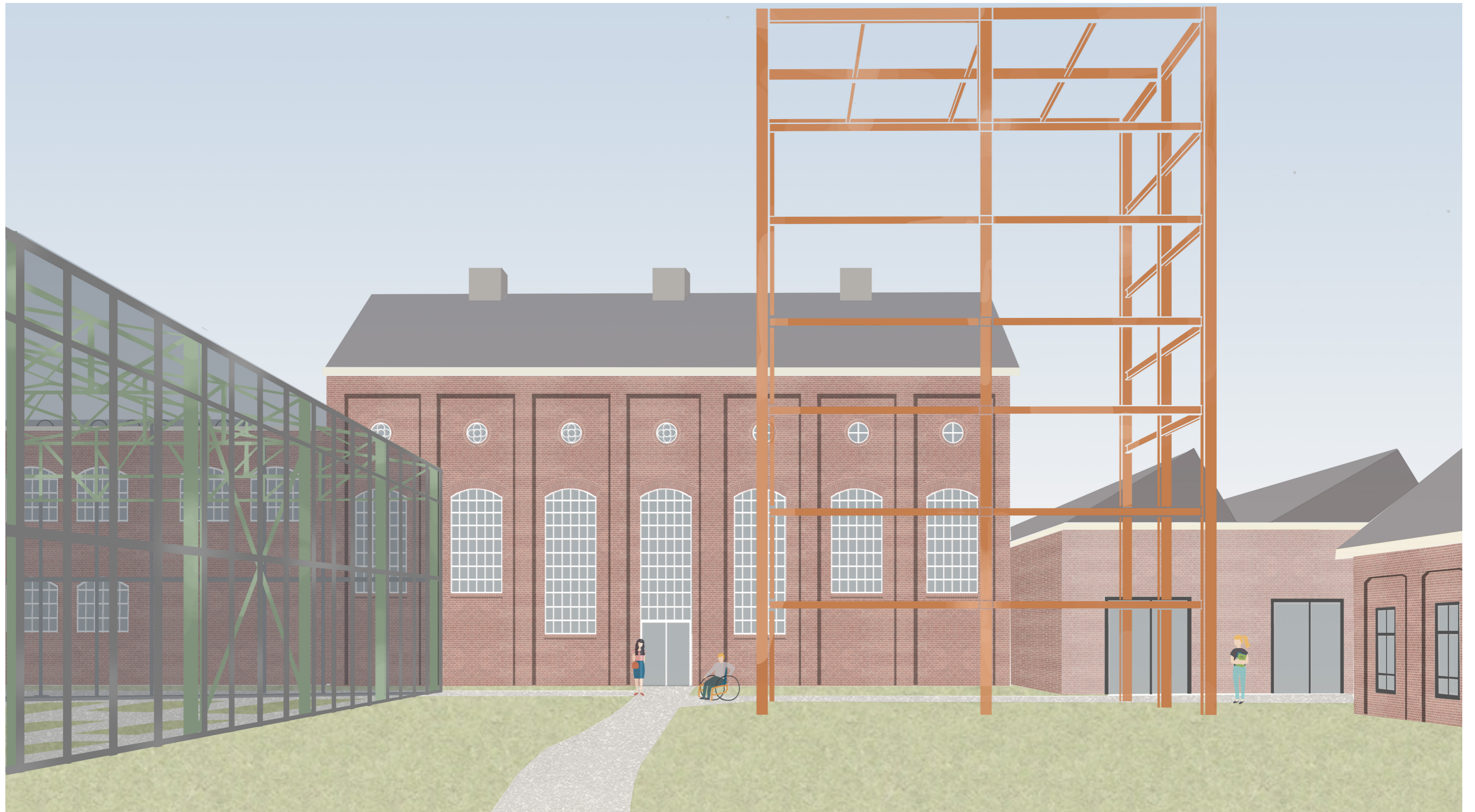
- housing (private)
- 'light' indoor street (semi-private)
- activity rooms
- public facilities

Zoning plan





























Source: Own illustration

## Building technology

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The strategy chosen is inextricably linked with my Heritage position and my target group. My target group, elderly people with a physical care demand, has specific wishes and needs regarding to a comfortable living environment and diminishing thresholds. My heritage position mainly focusses on reuse, by "renovating: upgrading an existing building to comfort and to technical and functional requirements, while leaving the appearance more or less unchanged". The main strategy hereby is insulating from the inside and keeping the characteristic atmosphere of the outside. In this way, the heat loss will be reduced and energy will be saved. A comfortable living environment does also mean having a connection with the outside world. This is done by adding new window openings, extending the roof lights and connections with the internal street.

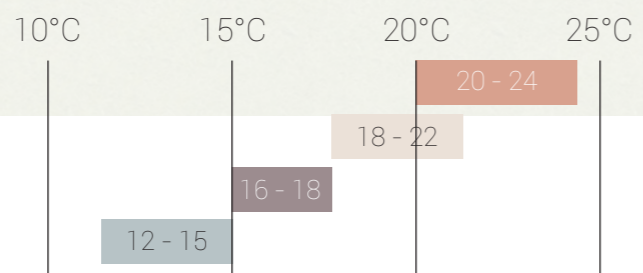
Some of the buildings will be redesigned, which is an important part of reuse. Redesigning with references to the "original" and adding new volumes as a need for more space. This is also in line with gestalt recycling "historical and traditional typologies and designs can be recycled by transforming them into the present day context". This has more to do with the new volumes I add. Reusing structures of demolished buildings and adding a new volume that reference to buildings in the past.



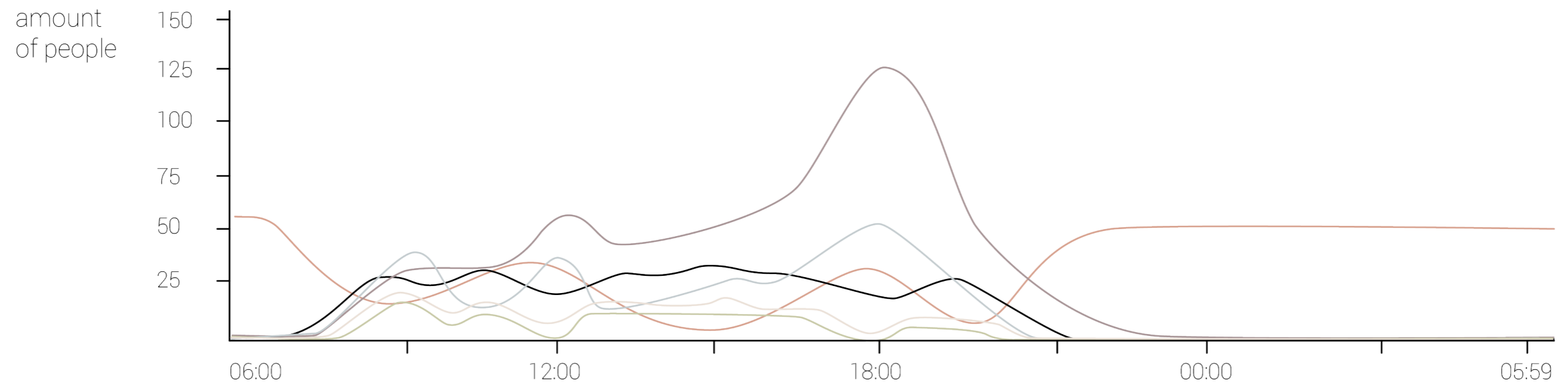


**Legend**

- apartments
- living space
- supermarket/fitness
- tea garden / greenhouse

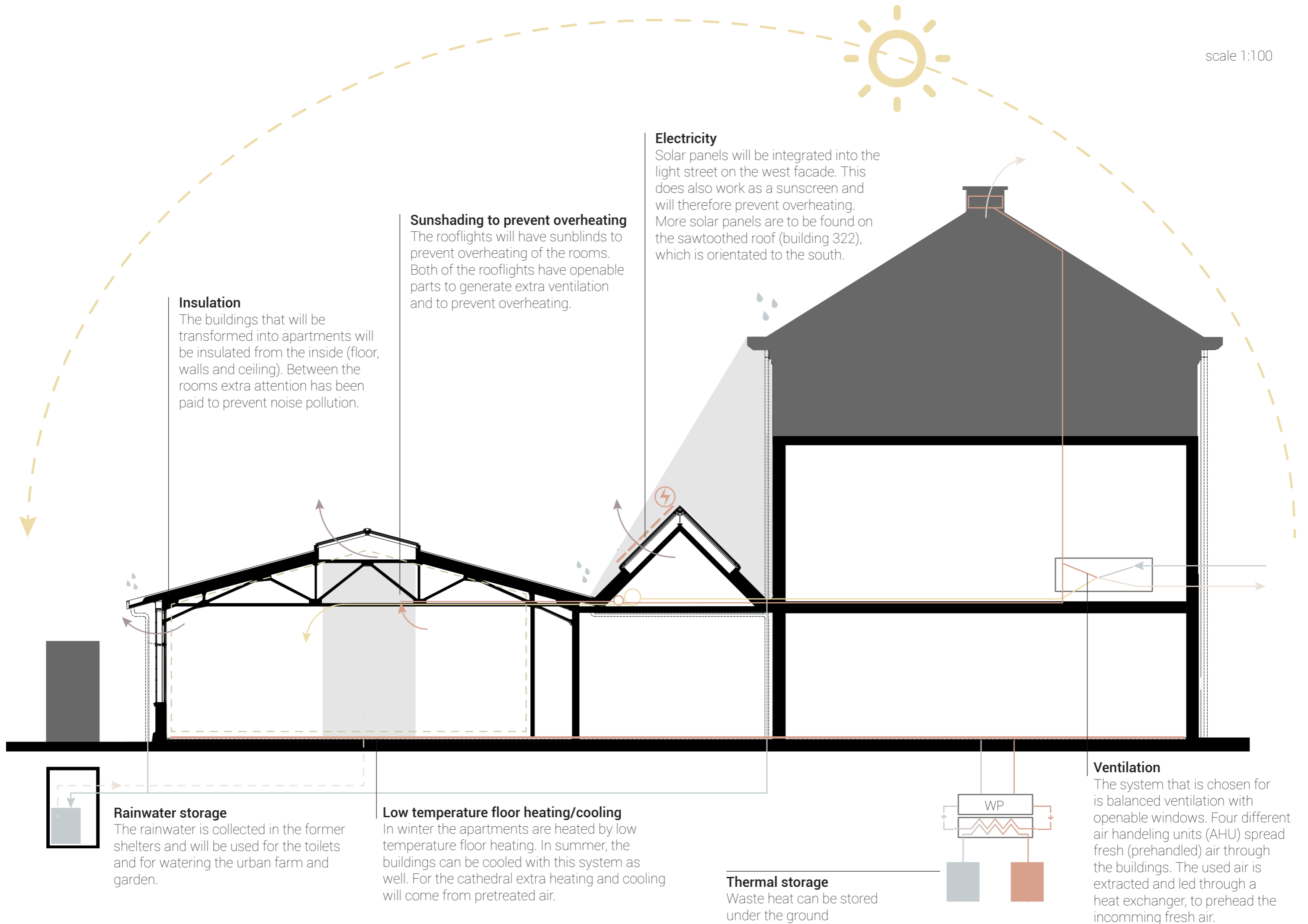






- housing elderly & staff (60)
- restaurant (max 150)
- common areas (5 x 15)
- fitness (max 14)
- health centre
- indoor light street





**Insulation**

The buildings that will be transformed into apartments will be insulated from the inside (floor, walls and ceiling). Between the rooms extra attention has been paid to prevent noise pollution.

**Sunshading to prevent overheating**

The rooflights will have sunblinds to prevent overheating of the rooms. Both of the rooflights have openable parts to generate extra ventilation and to prevent overheating.

**Electricity**

Solar panels will be integrated into the light street on the west facade. This does also work as a sunscreen and will therefore prevent overheating. More solar panels are to be found on the sawtoothed roof (building 322), which is orientated to the south.

**Rainwater storage**

The rainwater is collected in the former shelters and will be used for the toilets and for watering the urban farm and garden.

**Low temperature floor heating/cooling**

In winter the apartments are heated by low temperature floor heating. In summer, the buildings can be cooled with this system as well. For the cathedral extra heating and cooling will come from pretreated air.

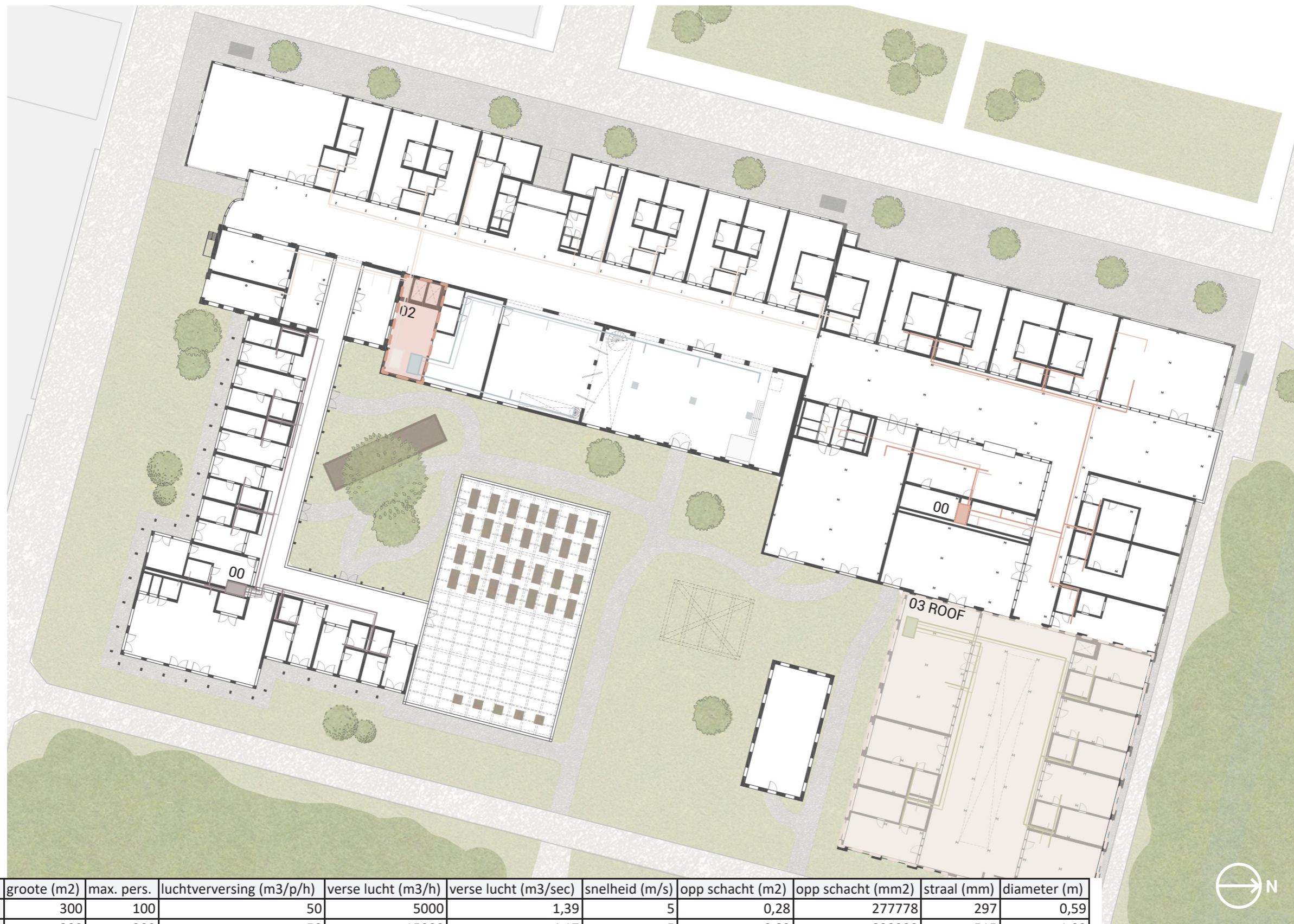
**Thermal storage**

Waste heat can be stored under the ground

**Ventilation**

The system that is chosen for is balanced ventilation with openable windows. Four different air handling units (AHU) spread fresh (prehandled) air through the buildings. The used air is extracted and led through a heat exchanger, to preheat the incoming fresh air.





Ruimte	grote (m2)	max. pers.	luchtverversing (m3/p/h)	verse lucht (m3/h)	verse lucht (m3/sec)	snelheid (m/s)	opp schacht (m2)	opp schacht (mm2)	straal (mm)	diameter (m)
Grote kathedraal	300	100	50	5000	1,39	5	0,28	277778	297	0,59
Grote kathedraal dans	300	300	50	15000	4,17	5	0,83	833333	515	1,03
Kleine kathedraal	146,4	50	50	2500	0,69	5	0,14	138889	210	0,42
Kleine kathedraal dans	146,4	150	50	7500	2,08	5	0,42	416667	364	0,73
1P appartement*	55	3	35	105	0,03	5	0,01	5833	43	0,09
2P appartement*	78	6	35	210	0,06	5	0,01	11667	61	0,12

Bron: Bouwbesluit min. Luchtverversing verblijfsgebied, verblijfsruimte, toiletruimte, badruimte = 25m3/p/h (=7•10<sup>-3</sup> m<sup>3</sup>/s)

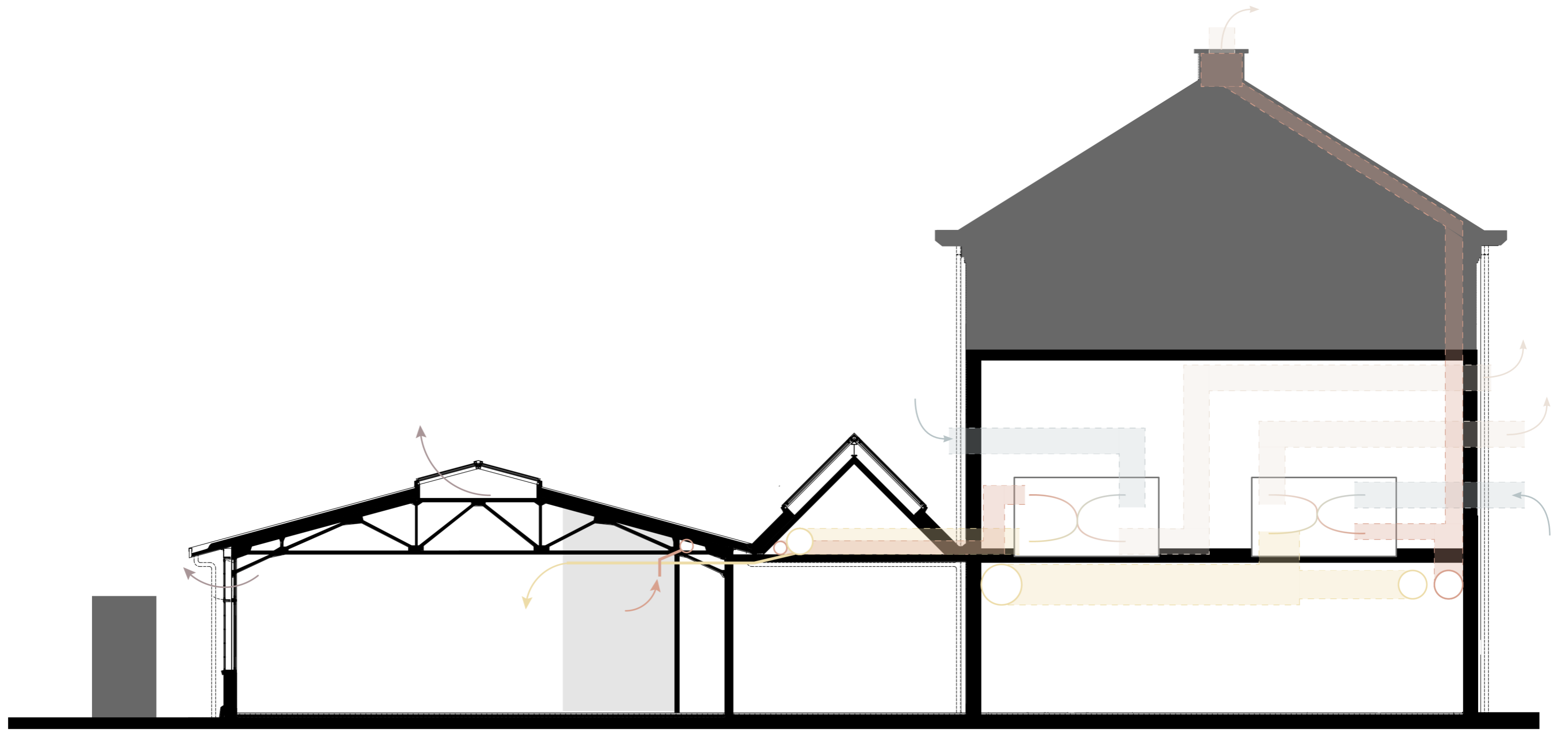
Bron: Bouwbesluit min. Luchtverversing Logiesfunctie, andere logiesfunctie (ruimte aan gemeenschappelijk gang) = 43m3/p/h (=12•10<sup>-3</sup> m<sup>3</sup>/s)

\* incl. slaapkamer en badkamer

scale 1:500



scale 1:100

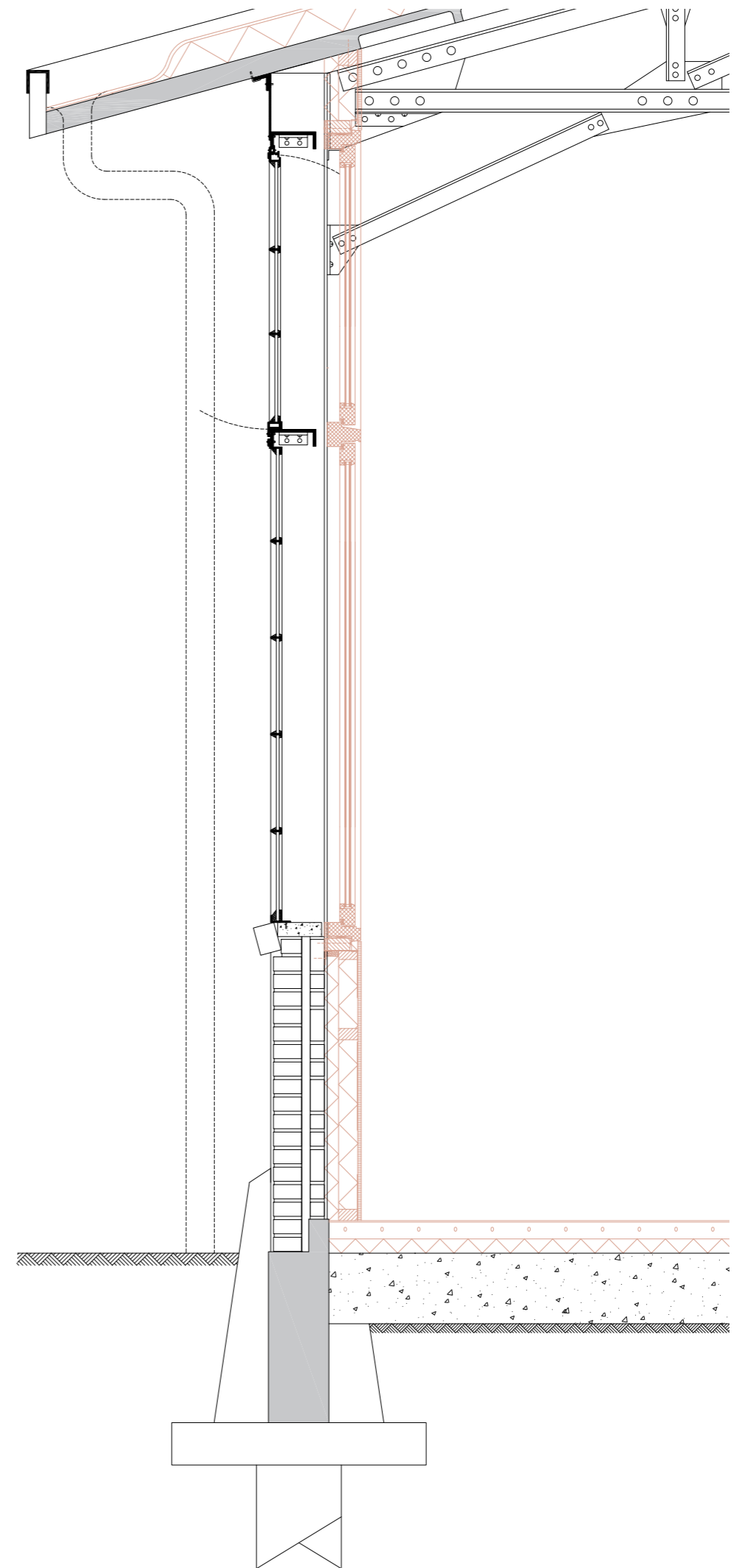
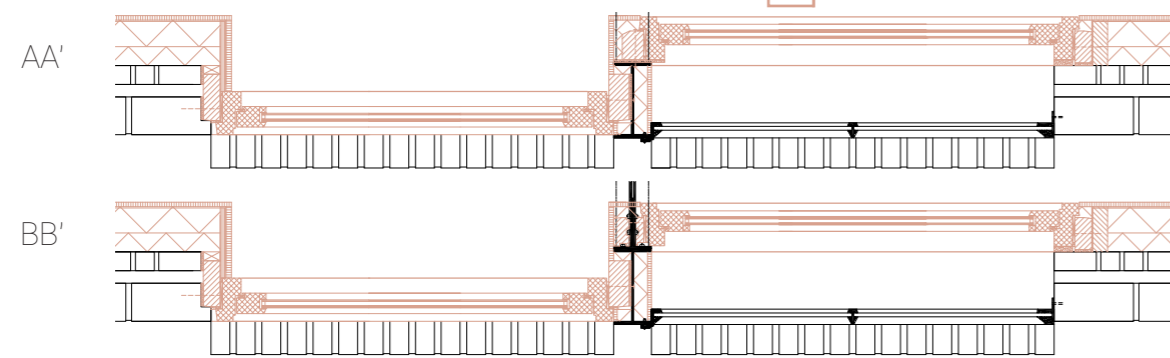




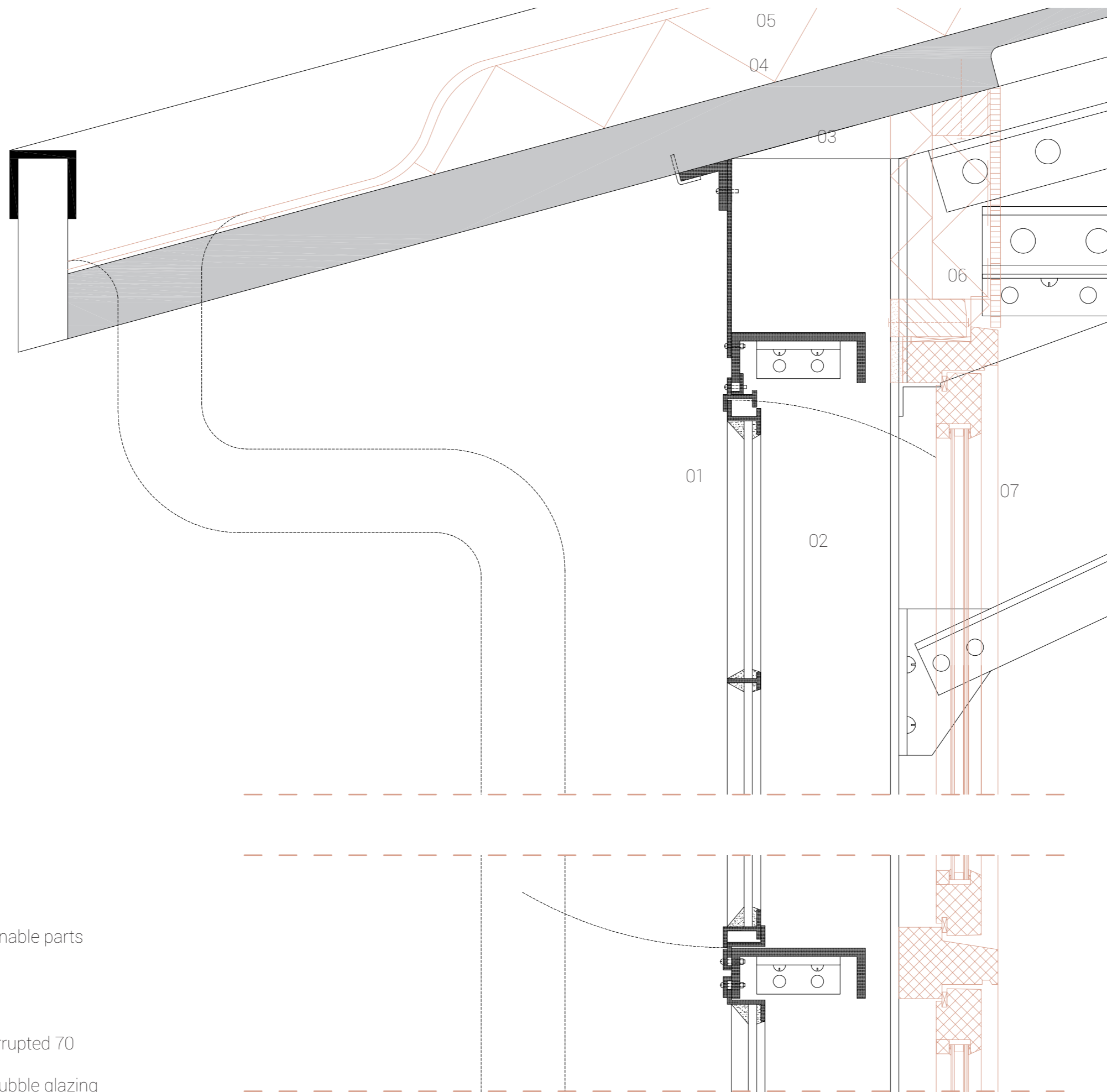
scale 1:100





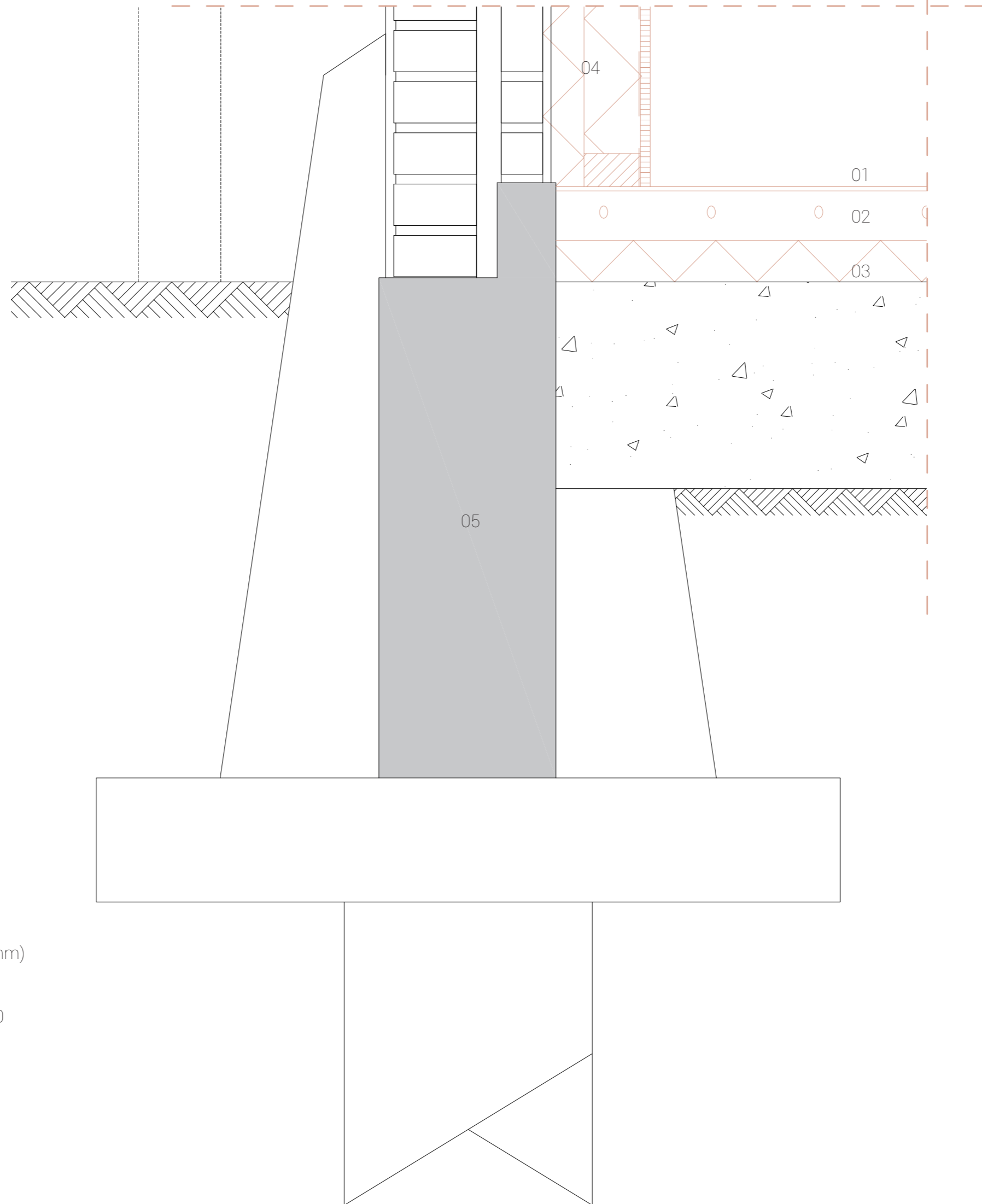






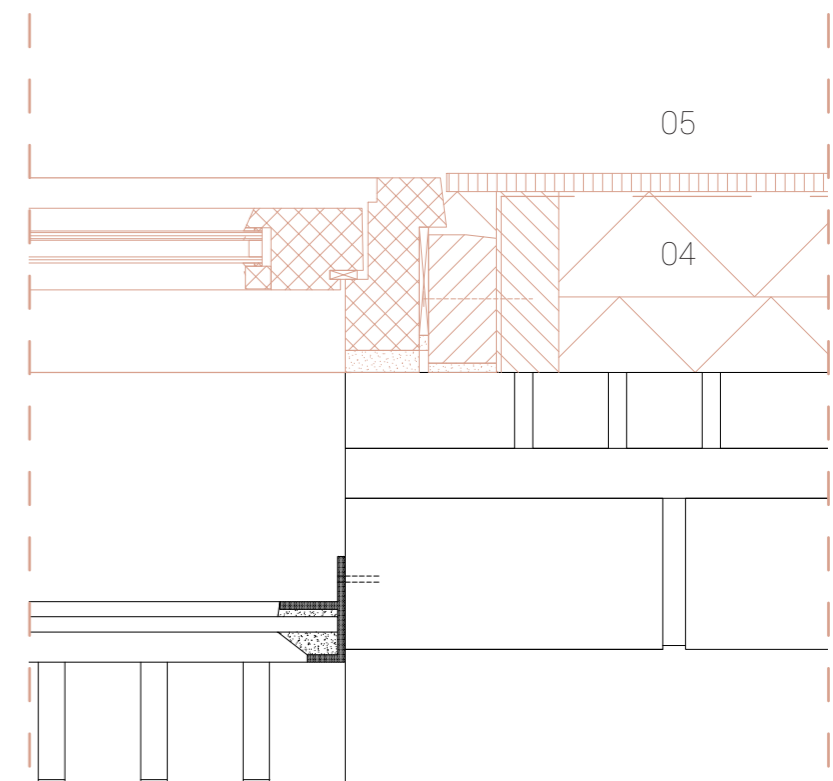
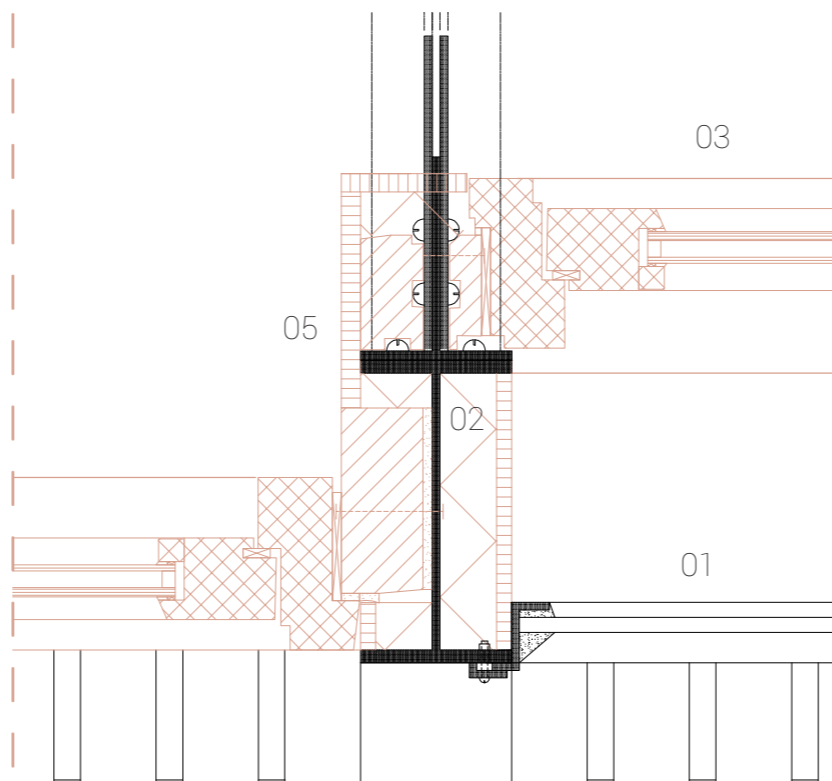
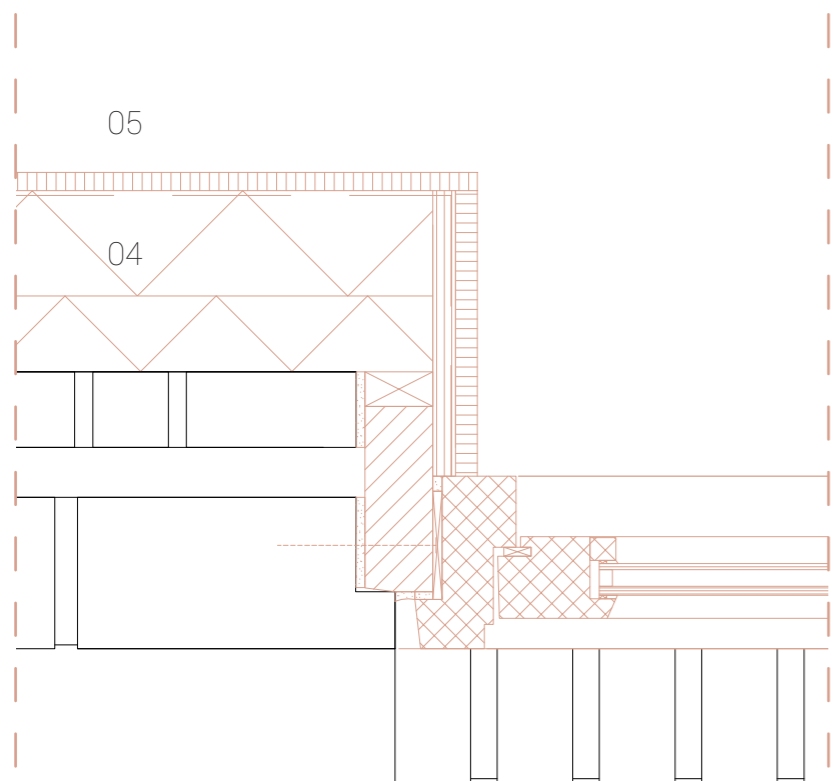
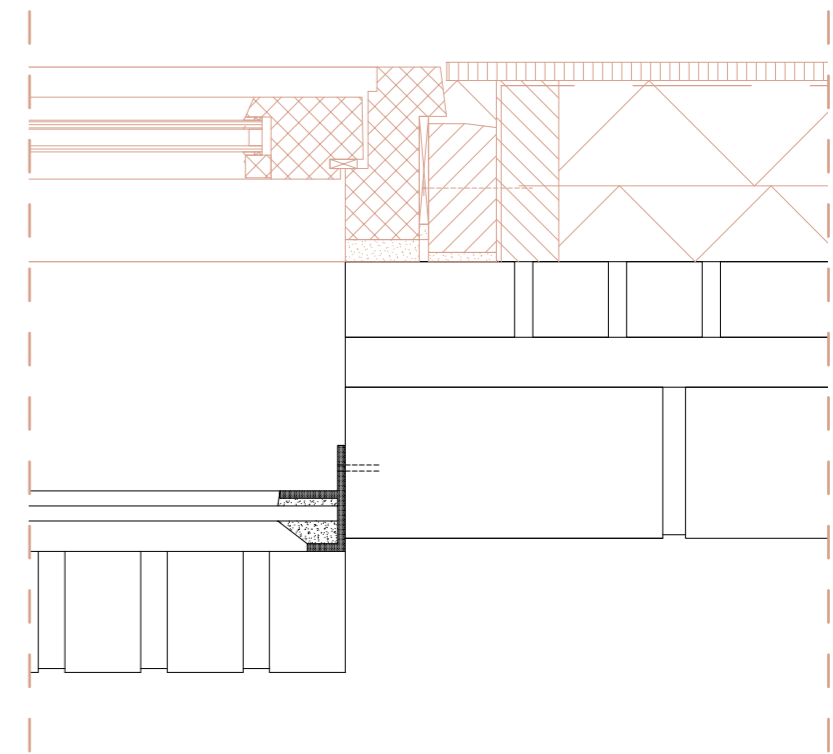
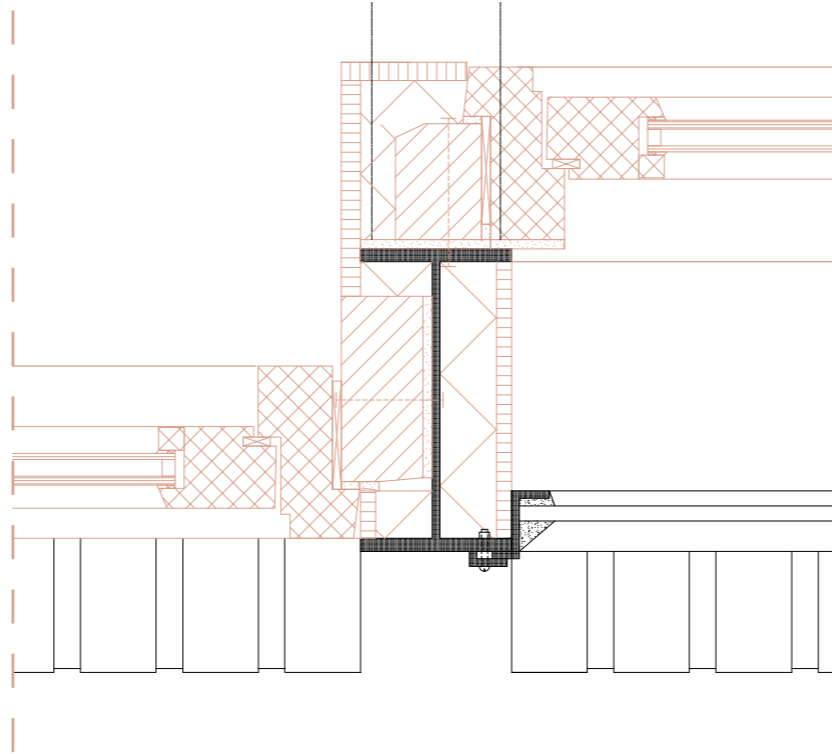
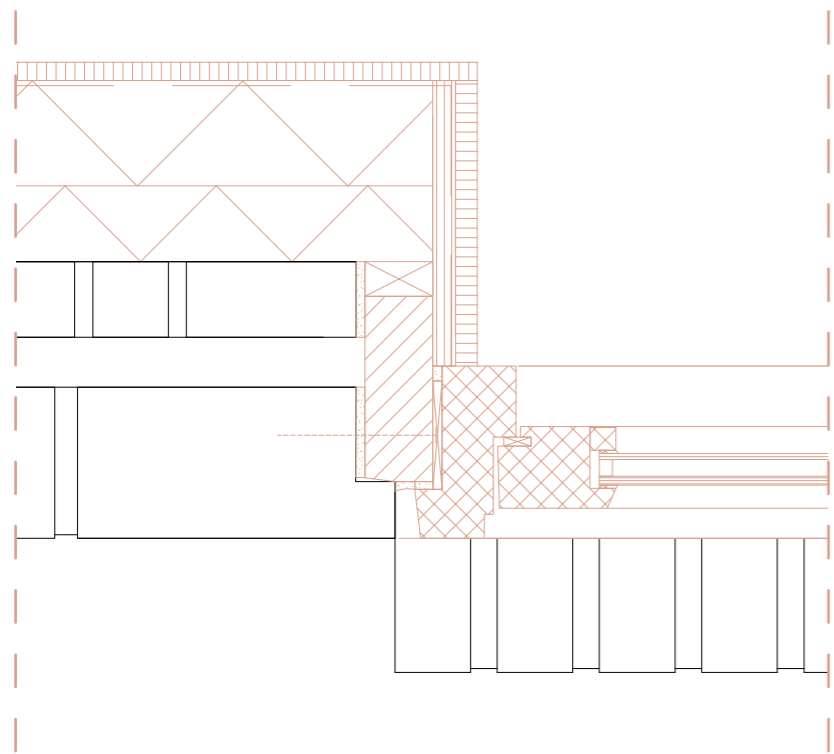
- 01 - existing steel windows, with openable parts
- 02 - existing steel column HEA 200
- 03 - existing Bimsbeton roof panels
- 04 - roof insulation 105 mm
- 05 - bitumen
- 06 - facade insulation 50 mm uninterrupted 70 mm in timber frame
- 07 - new second glass facade with double glazing with timber window frames





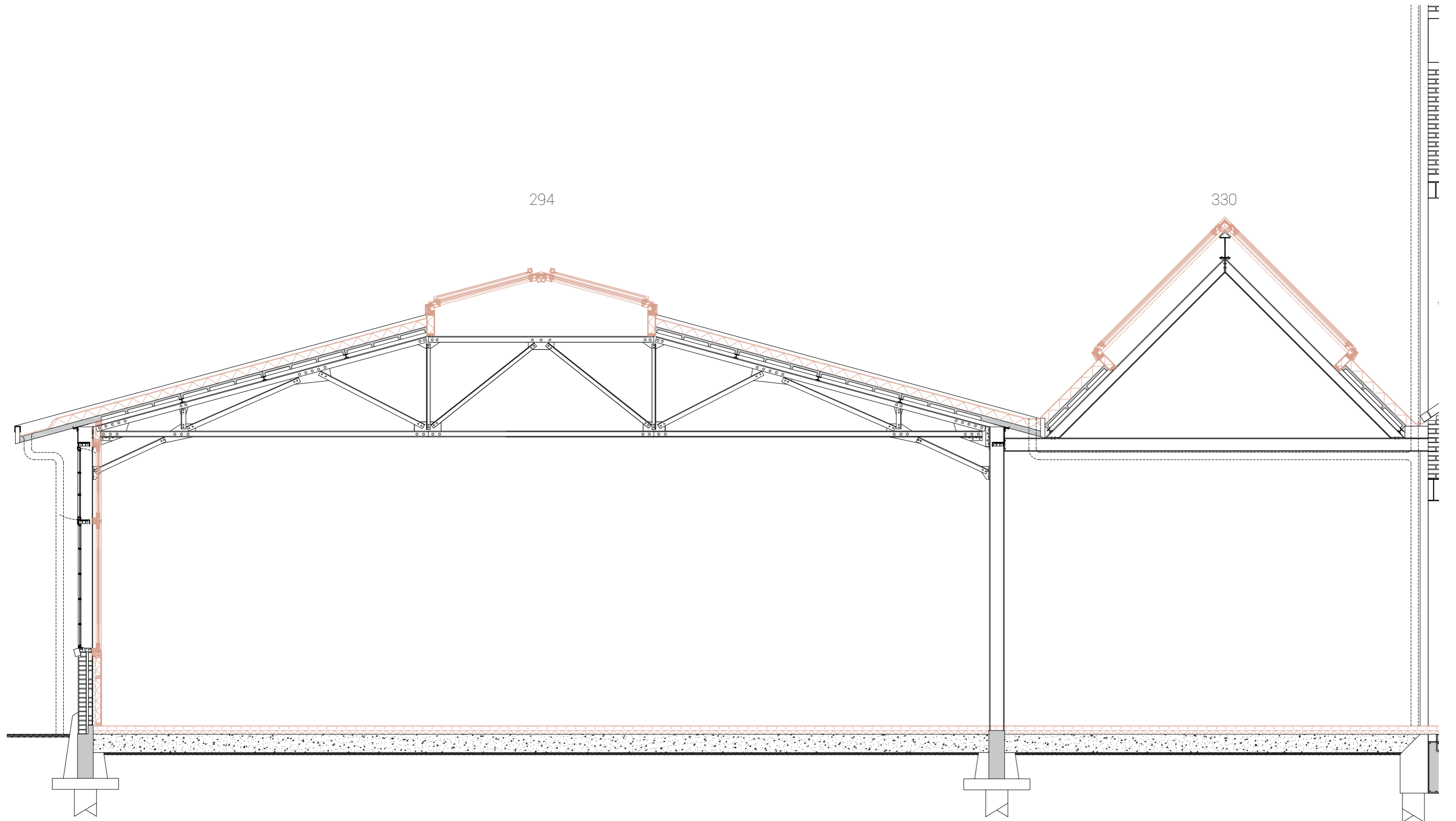
- 01 - marbled marmoleum Fresco Forbo (3,5 mm)
- 02 - low temperature floor heating (60 mm)
- 03 - insulation (70 mm)
- 04 - facade insulation 50 mm uninterrupted 70 mm in timber frame
- 05 - concrete beam





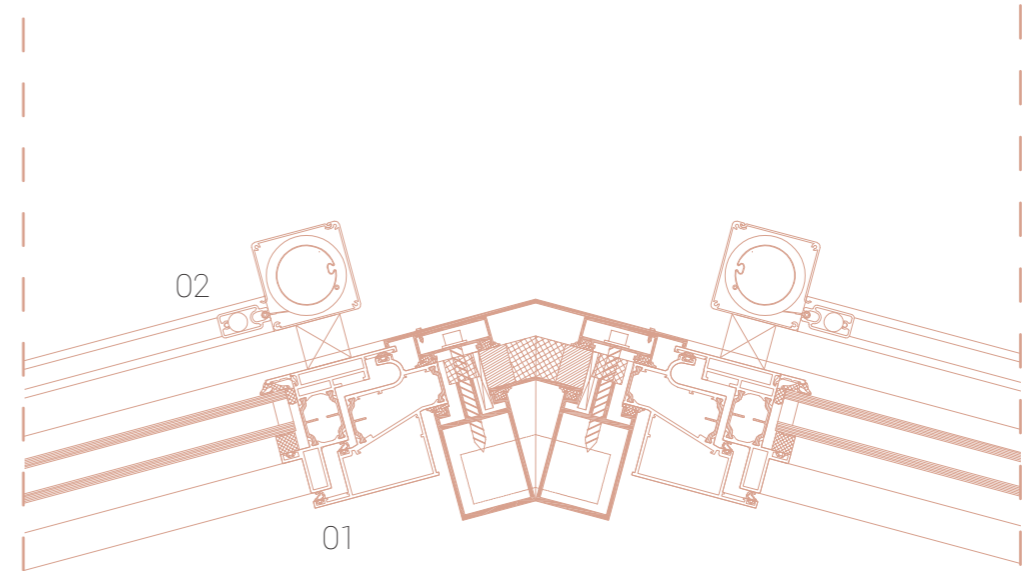
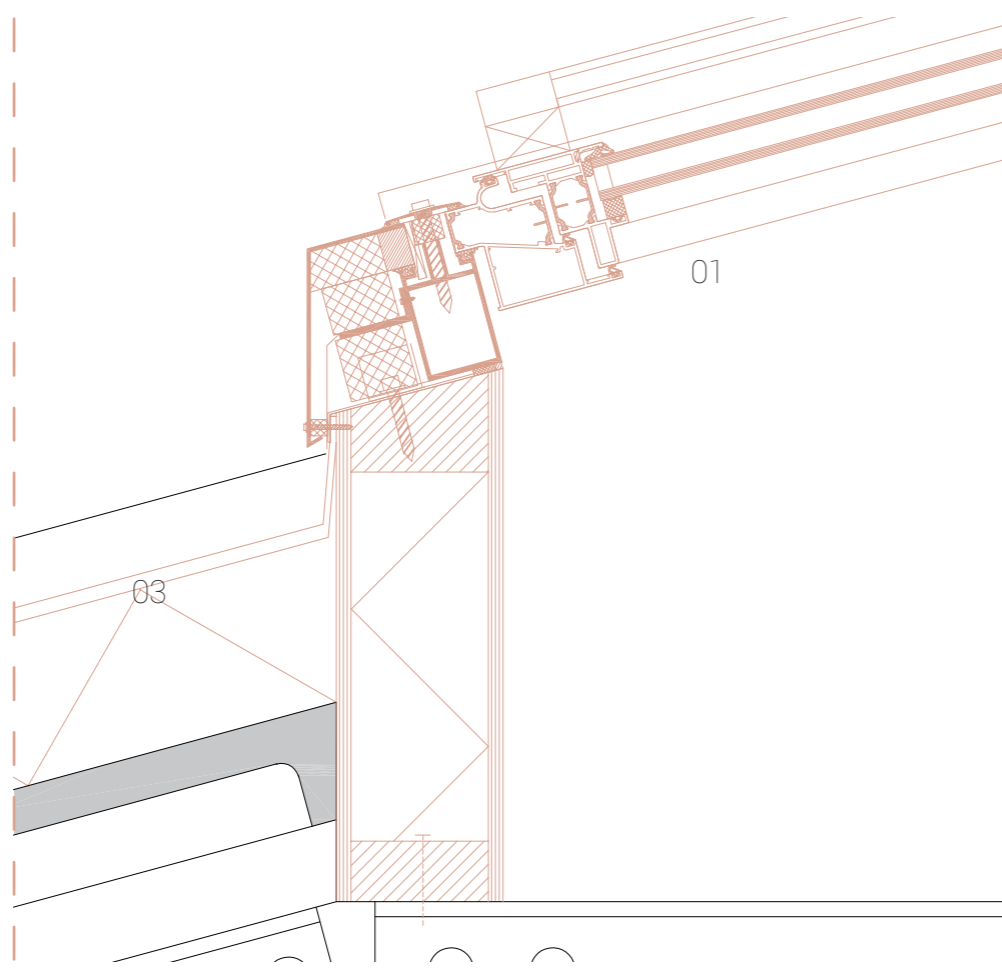
- 01 - existing steel windows, with openable parts
- 02 - existing steel column HEA 200
- 03 - new timber window frame (double glazing)
- 04 - two layers of insulation (50 mm and 70 mm)
- 05 - timber finish



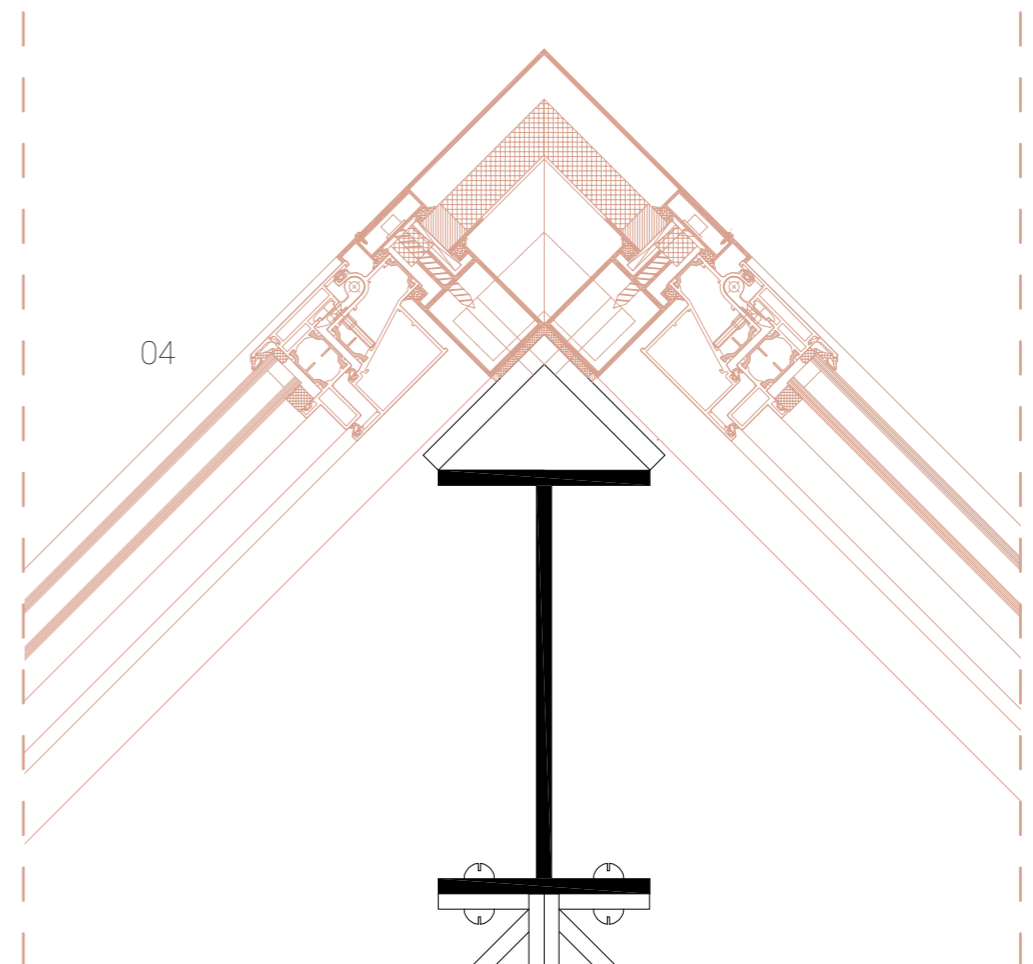
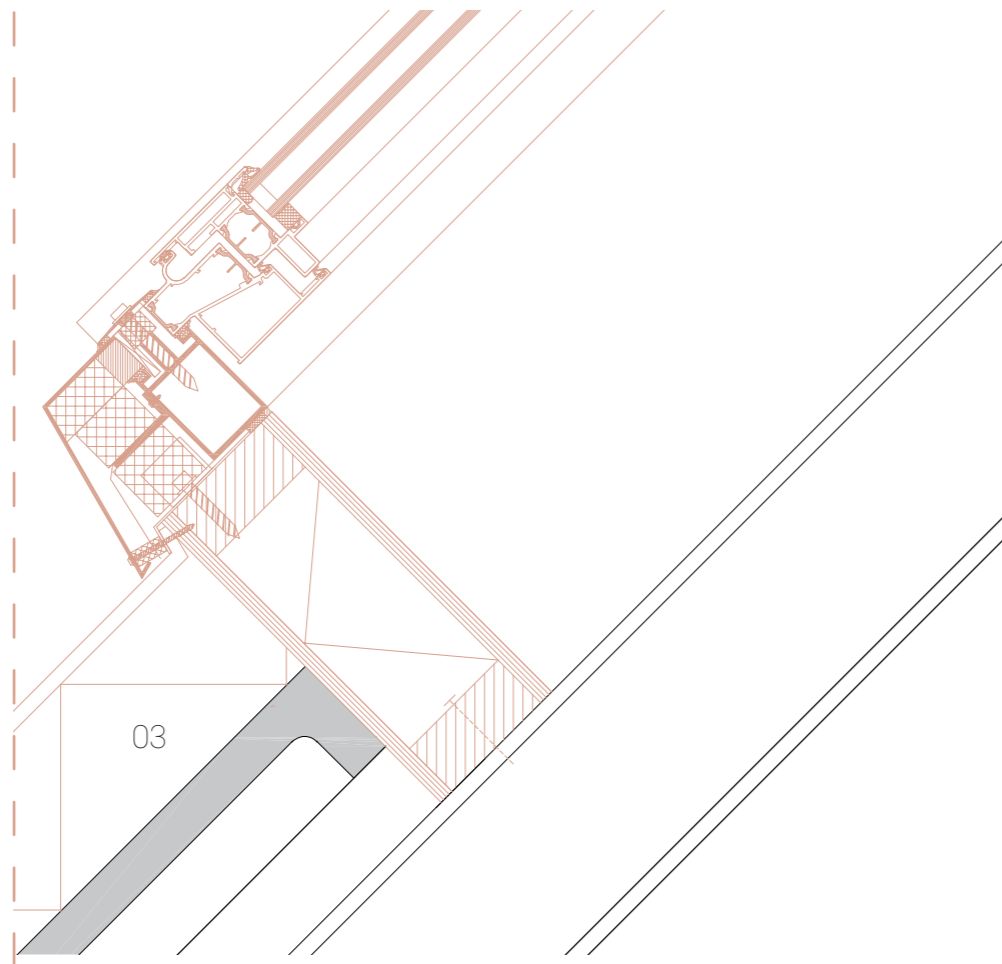




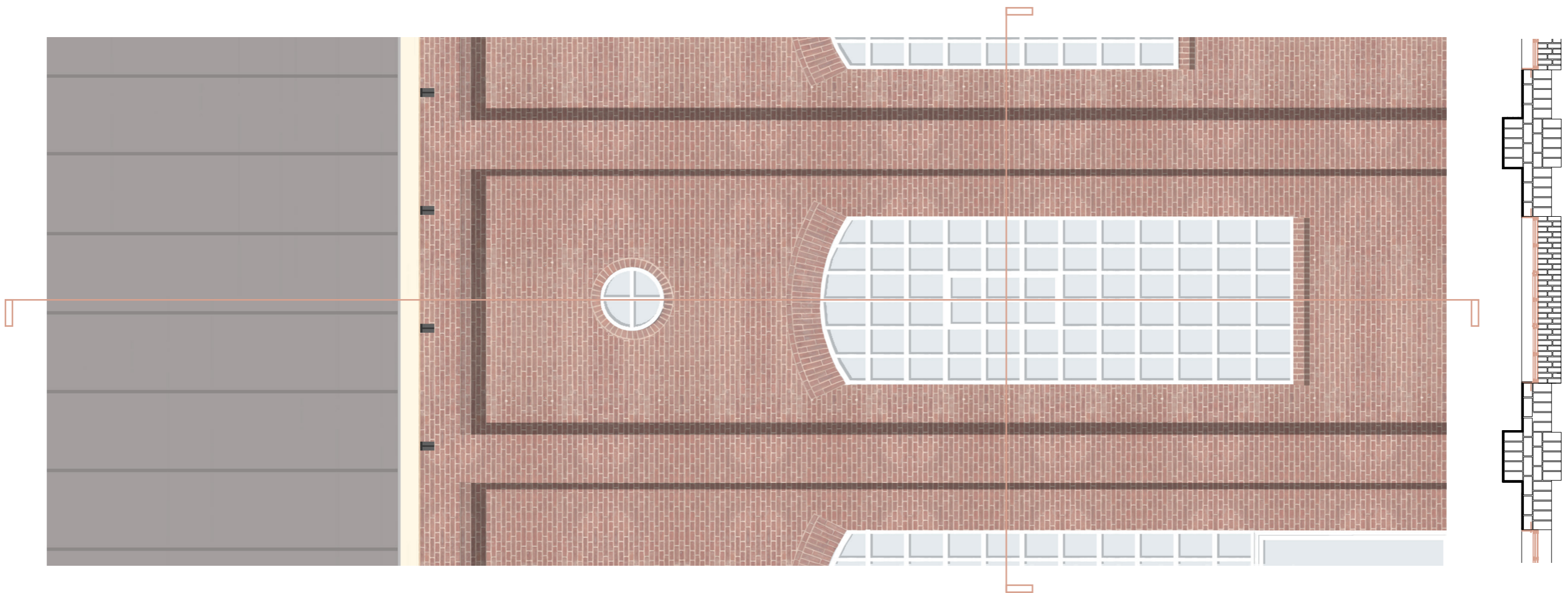
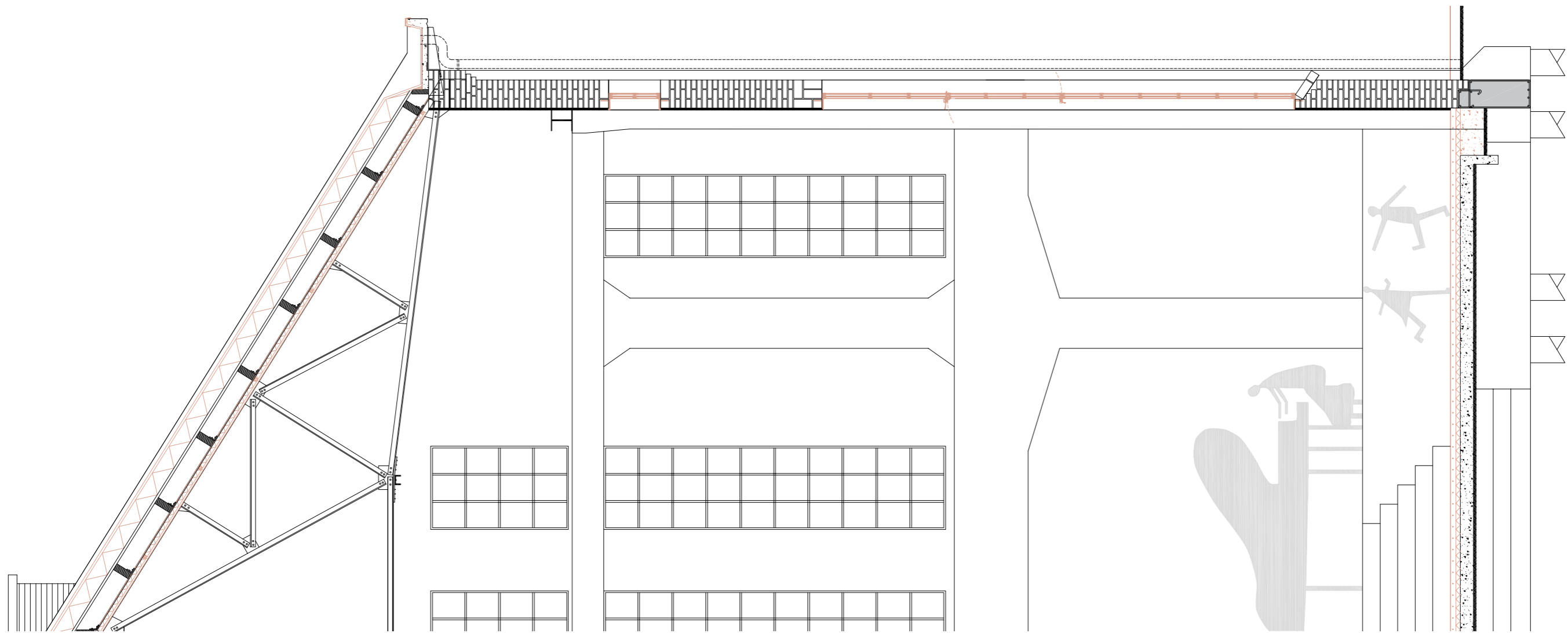
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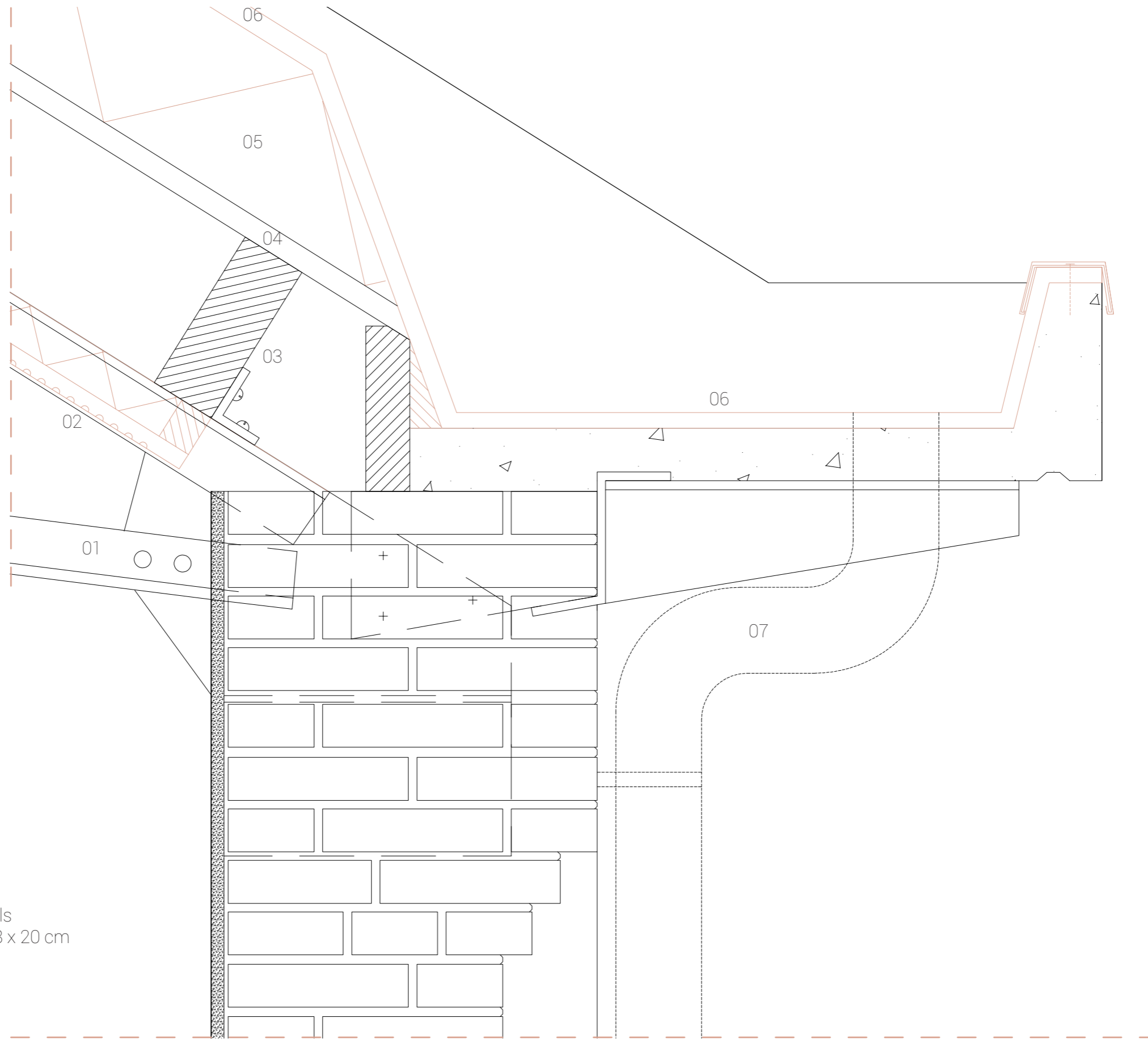
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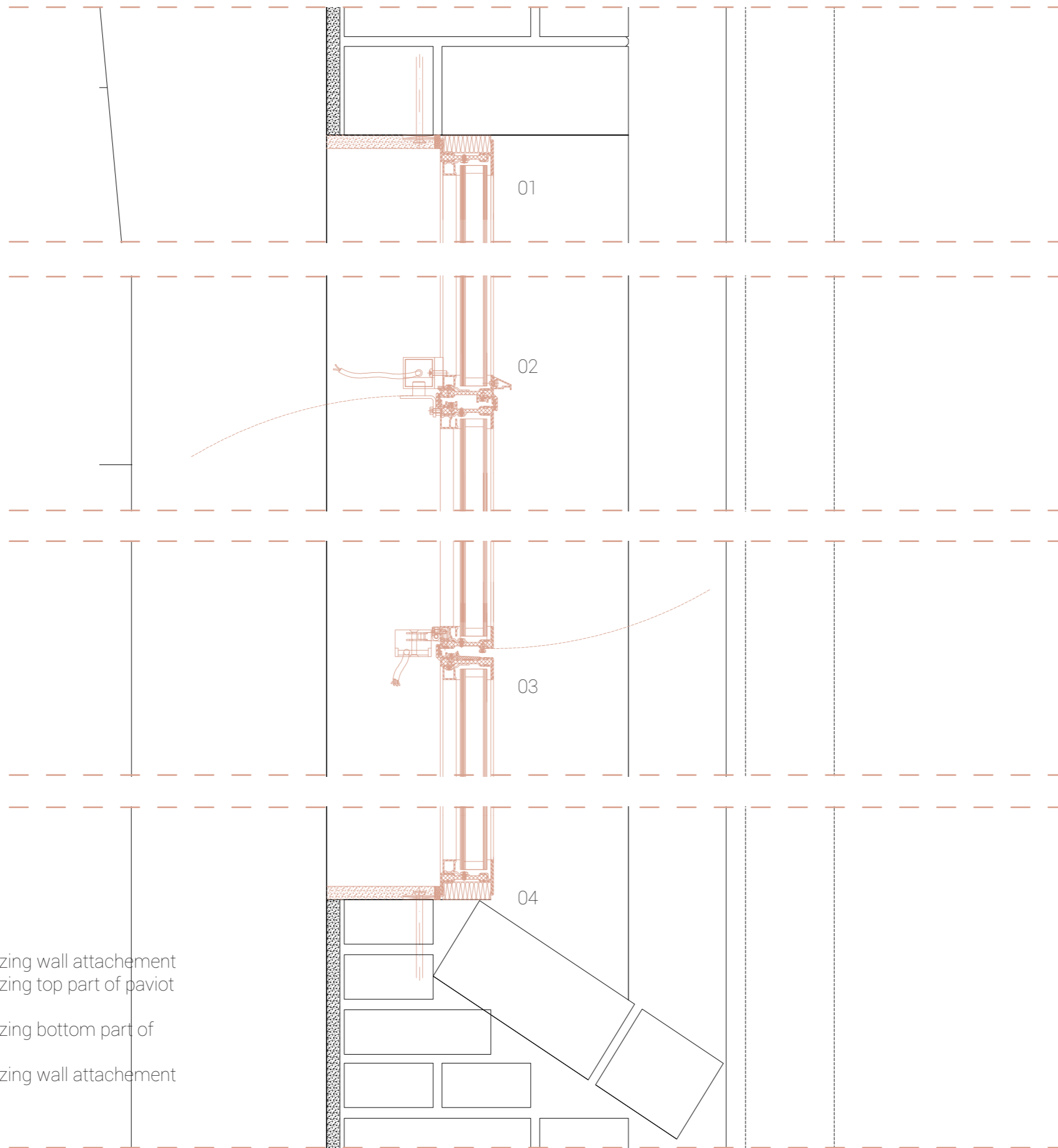


fragment 1:50

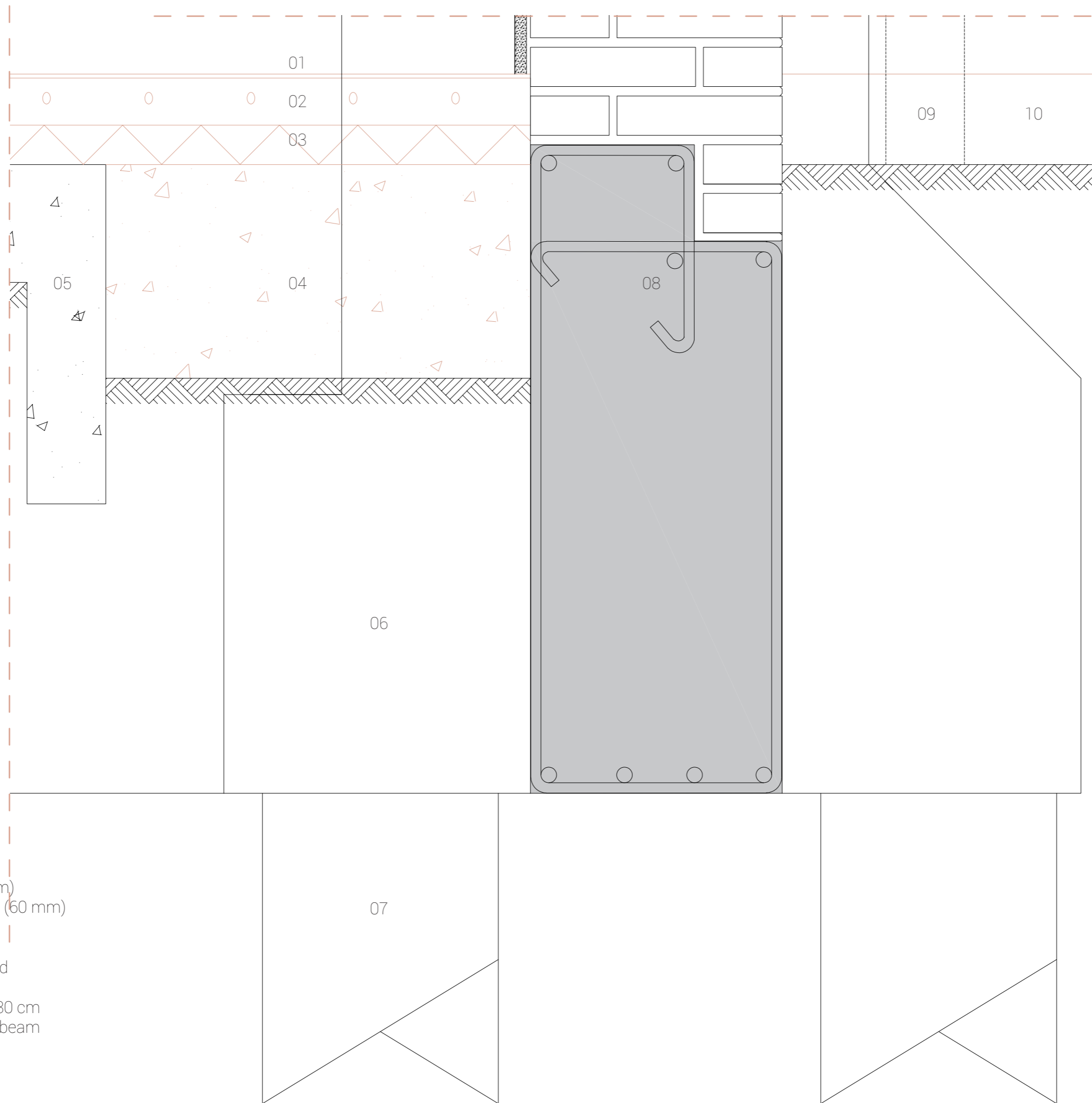


- 01 - existing steel roof construction
- 02 - metsäwood sound absorption panels
- 03 - existing timber roof construction 7,8 x 20 cm
- 04 - existing roof boarding 26 cm
- 05 - roof insulation (180 mm)
- 06 - bitumen water repellent layer
- 07 - concrete gutter
- 08 - drainpipe



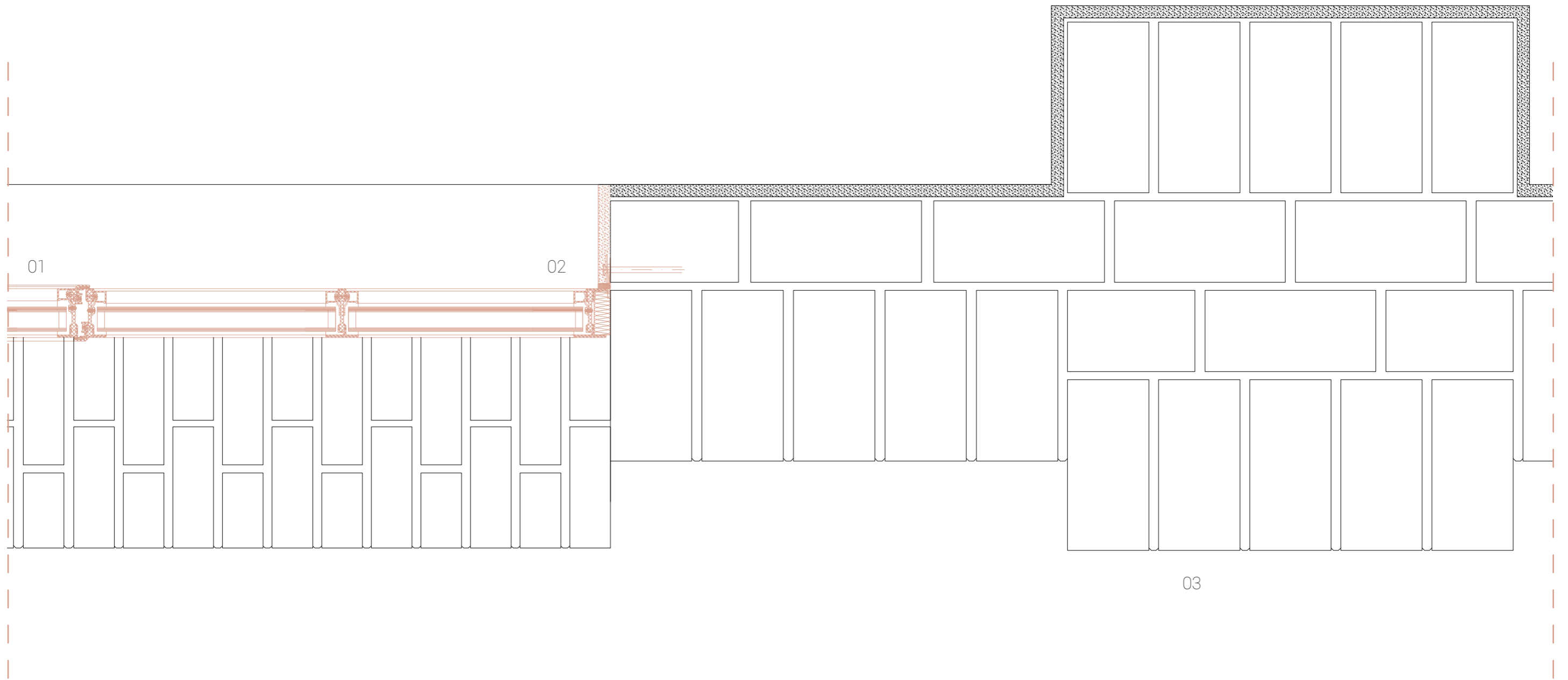


- 01 - janisol arte double glazing wall attachment
- 02 - janisol arte double glazing top part of pivot window
- 03 - janisol arte double glazing bottom part of pivot window
- 04 - janisol arte double glazing wall attachment



- 01 - Vinyl tiles Allura Forbo (3,5 mm)
- 02 - low temperature floor heating (60 mm)
- 03 - insulation (70 mm)
- 04 - new poured concrete
- 05 - existing concrete floor on sand
- 06 - concrete 'poer' (80 cm deep)
- 07 - concrete fudation poles 30 x 30 cm
- 08 - existing reinforced concrete beam
- 09 - drain pipe
- 10 - new floor level garden





- 01 - janisol arte double glazing part of paviot window
- 02 - janisol arte double glazing wall attachment
- 03 - thicker part of the brick walls ('penant')