

## **Micafil Housing - Research Phase**

*(does affordable housing have to be purely housing?)*







**Enough**  
*Master Thesis*

**Excess**  
*Rolf Imseng*

**HS23**  
*Studio Emerson*







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## History of the Site

*The site of the Micafil residential complex was formerly owned and used by the electrical components manufacturer «Micafil Insulation Technology». The company name derives from two crucial materials in the field of electrical engineering: «Mica» as in the mineral «mica» and «fil» which stands for «wire». Even though the housing complex and the manufacturer have no affiliations anymore the name remained. The plot is situated east of their production facilities and served in the 1960's as storage space for the epoxy and wires used to craft their products. With the rising popularity of the automobile and on-demand delivery in the early 1970's the plot was utilised as parking space for the companys employees.*

*In 1996 when «ABB» bought «Micafil», they planned to transform the empty plot into a housing complex to diversify their portfolio. A private «Gestaltungsplan» was designed but later on, as the financial risk was seen as too high for an electrical components manufacturer, sold to an investor.*

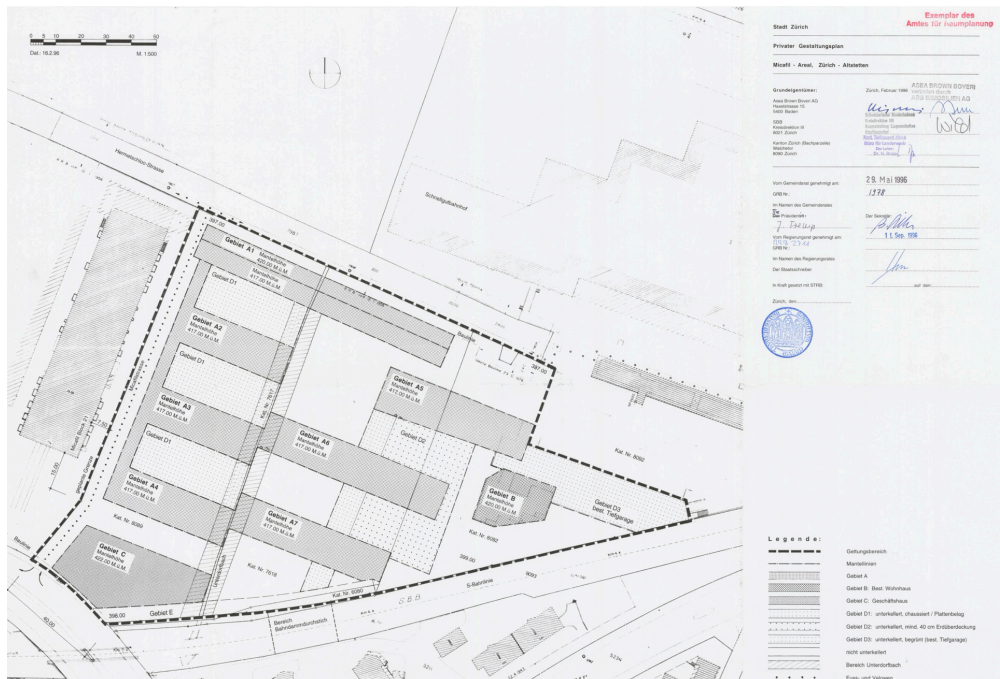


Site in 1966





Site in 1973



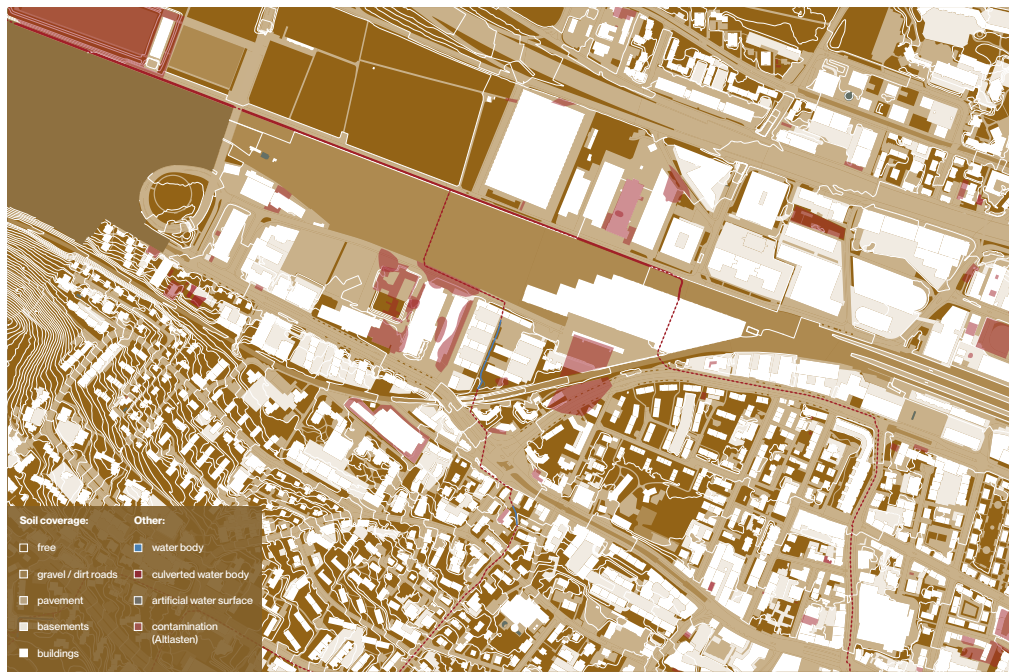
«Privater Gestaltungsplan Micafil» from 1996

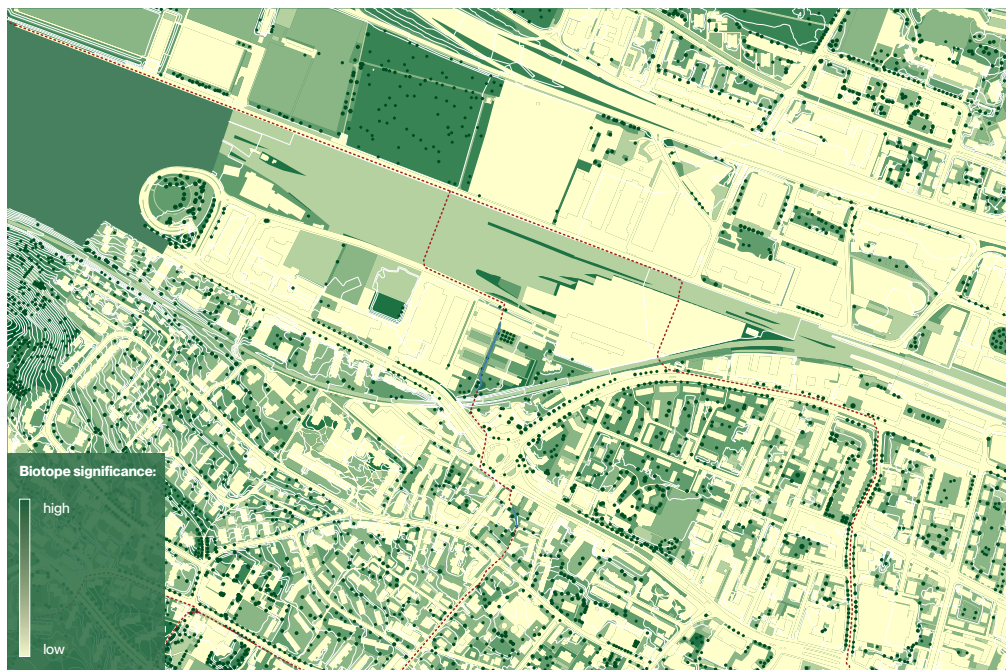


## Anatomy of the Site

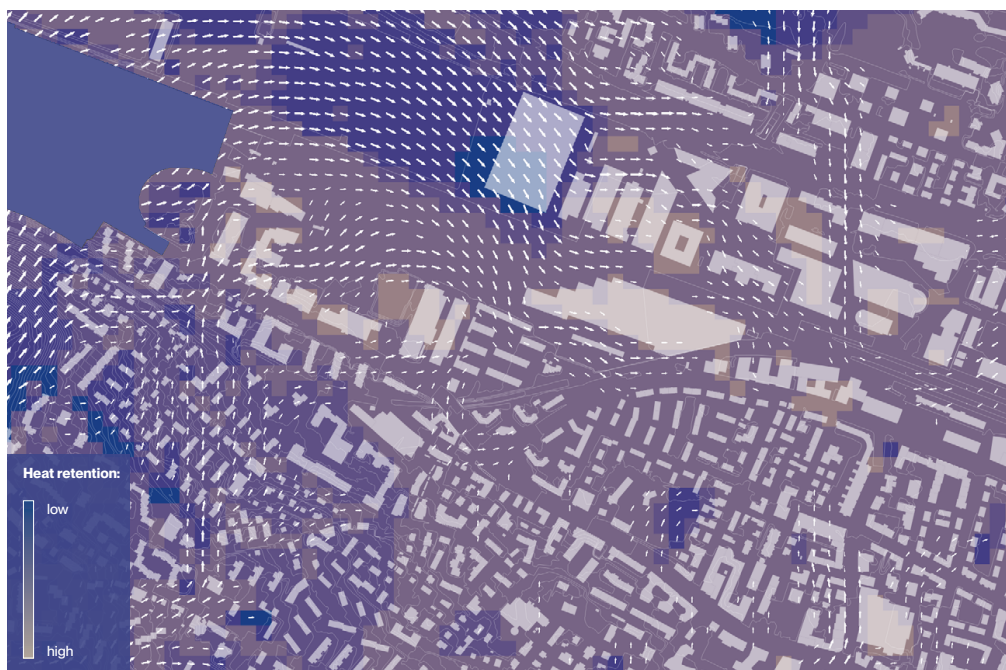
*The sites location between the train tracks makes it an exception as it is the only housing complex in the «Hermetschloo» Area. The unique location poses its own challenges and qualities. Given the sites history the soil was partially contaminated and had to be treated until a certain depth. Nevertheless the pollution, an important biotope has evolved in the last 23 years around the housing complex. Especially the «Altstetter Bach» which was uncovered during the construction of the housing complex and is now home to a variety of plants and smaller animals.*

*While natural ventilation was originally given, the strict measures of noise protection blocked off the main ventilation corridors. Coupled with the sheer mass of concrete in the area, a high heat retention is the result.*





Biotopes and their Significance



Ventilation and Heat Retention



## **Leopold Bachmann**

*Leopold Bachmann is a Swiss entrepreneur, investor and trained civil engineer. He built 1500 inexpensive apartments in and around Zurich. He started his first settlements in the suburbs of Zurich in the 1970s, and since then, he has been building cheap apartments without project developers and construction managers. The deceased engineer was working as a one-man business. His main principle was to provide as much living space as possible for as little money as possible. Leopold Bachmann's approach to building cheap apartments involved developing his own projects and building them without the involvement of project developers and construction managers. He developed his own method of project development and has built a network of relationships in the construction industry. He achieved his low rent prices by using simple and functional designs, using prefabricated elements, and avoiding expensive materials.*

*Despite his success, Bachmann has faced several challenges related to his projects. One of the main challenges has been the resistance from local residents who are opposed to the construction of large settlements in their neighborhoods. Bachmann's settlements are designed to be pedestrian-friendly, with car-free zones and plenty of green spaces, but some residents have criticised them for being too dense and not in keeping with the character of the neighborhood. Another challenge has been the difficulty of obtaining financing for his projects. Bachmann's approach to building cheap apartments has been successful, but it has also made it difficult for him to obtain financing from traditional sources such as banks and investors. As a result, he had to rely on his own resources.*

*One of the main problems of all his housing complexes is the lack of insulation in the buildings, which lead to high heating costs, thermal discomfort and poor sound insulation. The use of low-quality materials also led to multiple big renovations only after 13 years such as a leaky roof in the «Micafil Areal», which was fixed over two months compared to the total construction time of just 9 months.*

*Despite these challenges, Bachmann has been able to build affordable housing that meets the needs of people with low to medium incomes, and his approach has been recognised by the Swiss government as a viable solution to the housing crisis.*



Micafli Alstetten. 247 Units. 2000



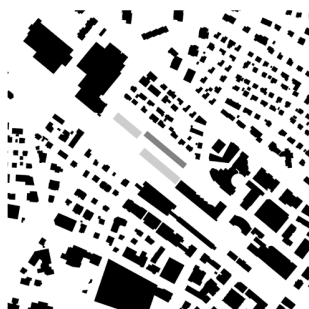
Röntgen Zurich. 317 Units. 2000



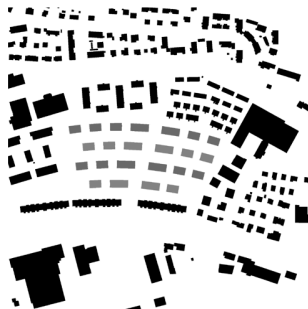
Neunbrunnen Oerlikon. 140 Units. 2003



Wülflingen Winterthur. 400 Units. 2003



Bahnhof Uster. 160 Units. 2004



Hezi Winterthur. 420 Units. 2003



Bachmann in 2002





Micafil Housing Complex in Altstetten with 247 Apartments, 2000



Röntgen Housing Complex in Zurich with 317 Apartments, 2000



Housing Complex in Winterthur Hegi with 420 Apartments, 2003



Housing Complex in Oerlikon Neunbrunnen with 140 Apartments, 2003



## Micafil Residential Complex

*The Micafil Housing was, as stated, built with the sole supervision of the investor and engineer Leopold Bachmann. He kept the construction time as low as possible by employing numerous contractors who worked simultaneously. While on the top floor concrete was still poured, the ground floor was already done. This, the systematic approach and the contractors freedom to use overflux materials for jobs like tiling, led to a record breaking of only 9 months for the construction of the 247 apartments.*

*All of them follow the same principles and the floor plans is carried through all floors with little to no alterations. This is mostly noticable on the ground floor where no community spaces are situated but solely apartments to maximise space and profit. The only commonly used space is the playground which was not originally planned. Parents had to fight four years for it after the finition of the construction, which highlights the stance of the investor on unprofitable spaces.*

Apartment Size	Quantity	Size	Occupancy	Space p.P
1.5 Rooms	6	37 m2	1.3	28 m2
2.5 Rooms	89	66 m2	1.4	47 m2
3.5 Rooms	57	90 m2	2.4	38 m2
4.5 Rooms	89	110 m2	2.8	39 m2
5.5 Rooms	6	130 m2	3.2	41 m2
<b>Total and ø</b>	<b>247</b>	<b>88 m2</b>	<b>2.18</b>	<b>41 m2</b>

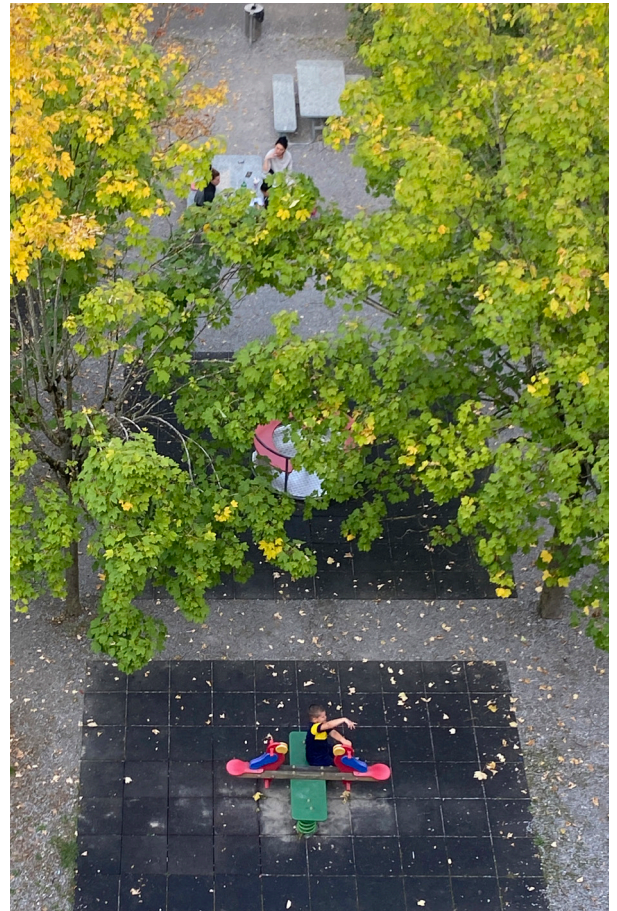


Facade towards Train Tracks





Ground Floor Kids Room



Playground





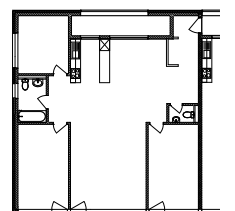
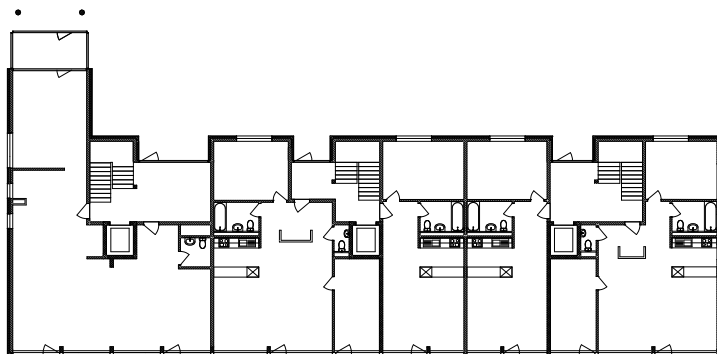
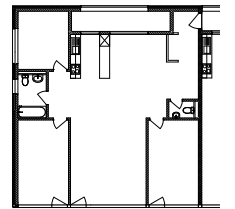
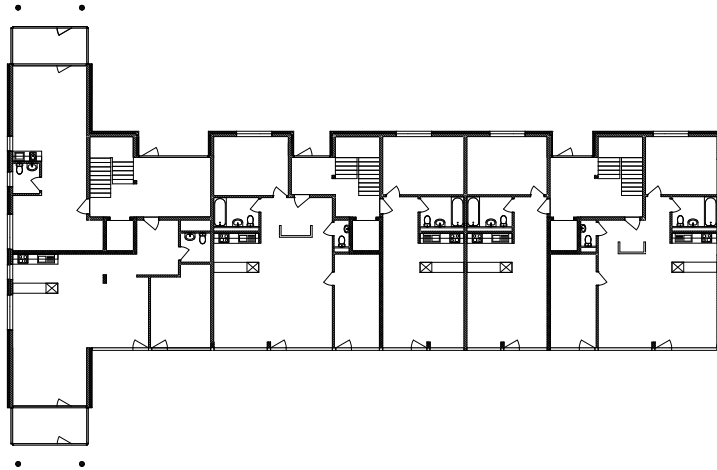
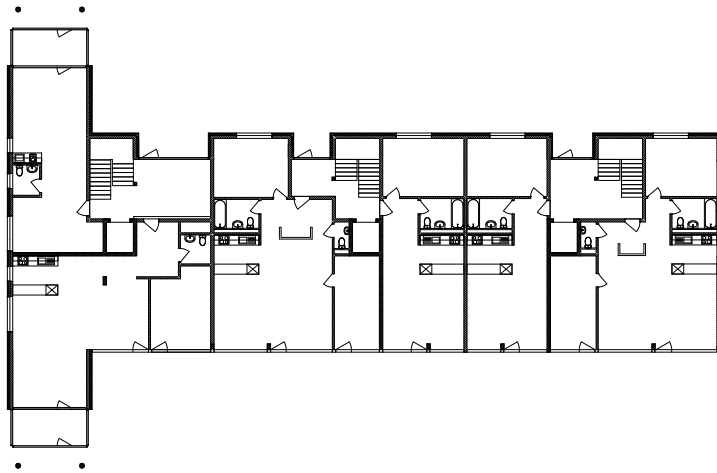
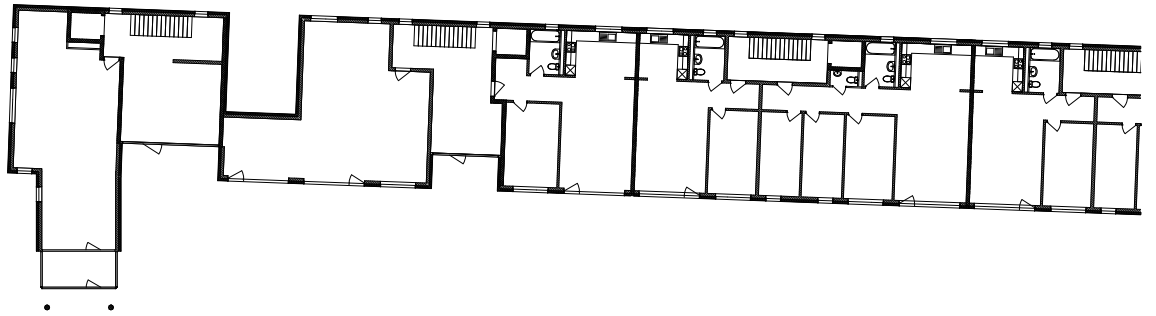
View inside the Complex

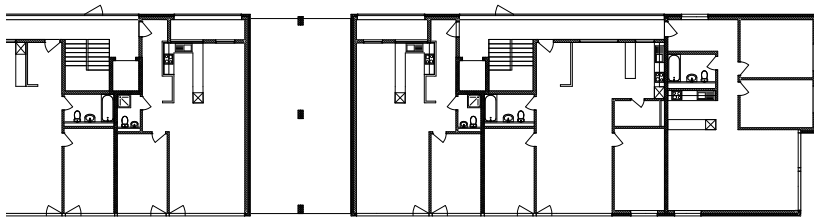
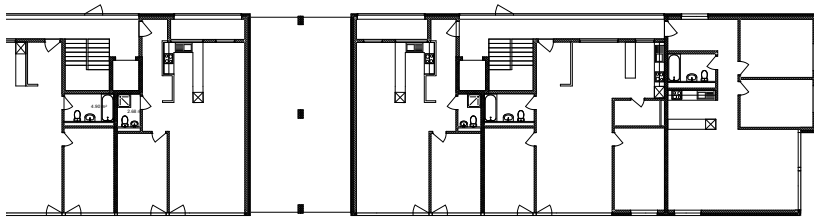
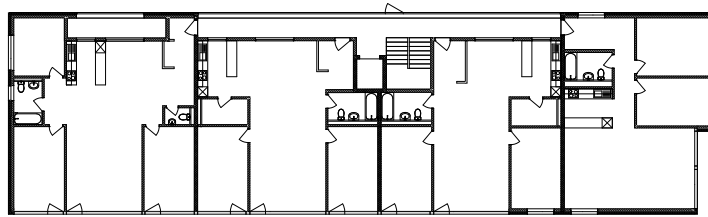
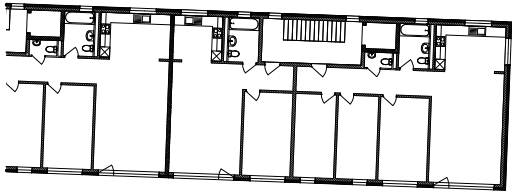




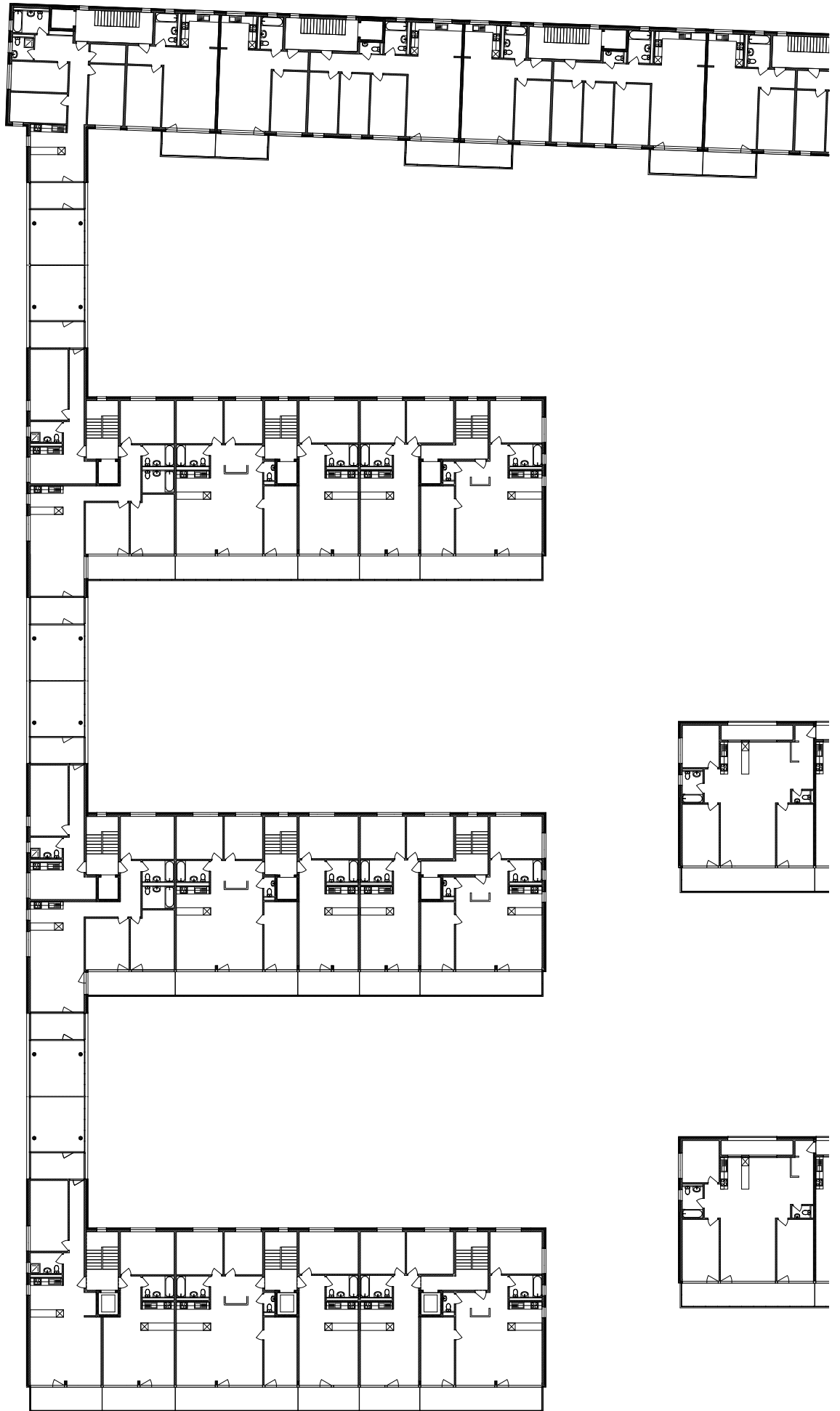


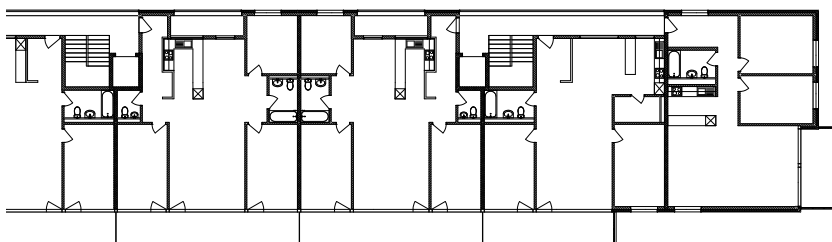
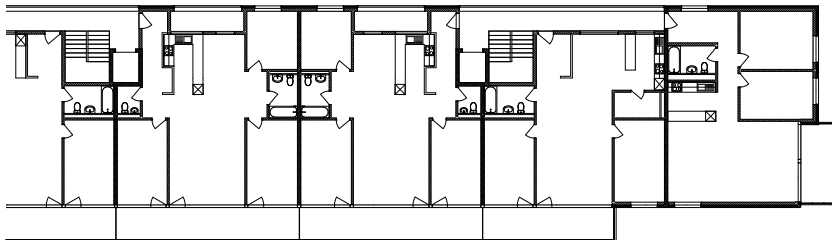
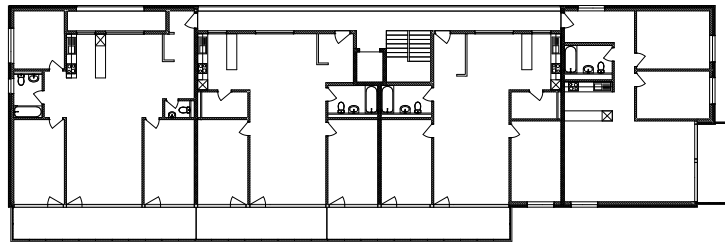
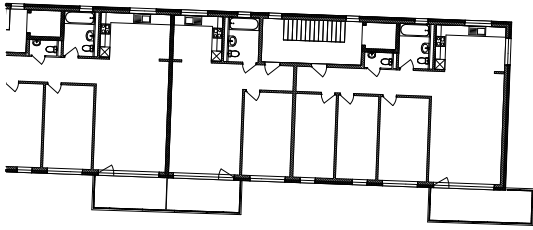




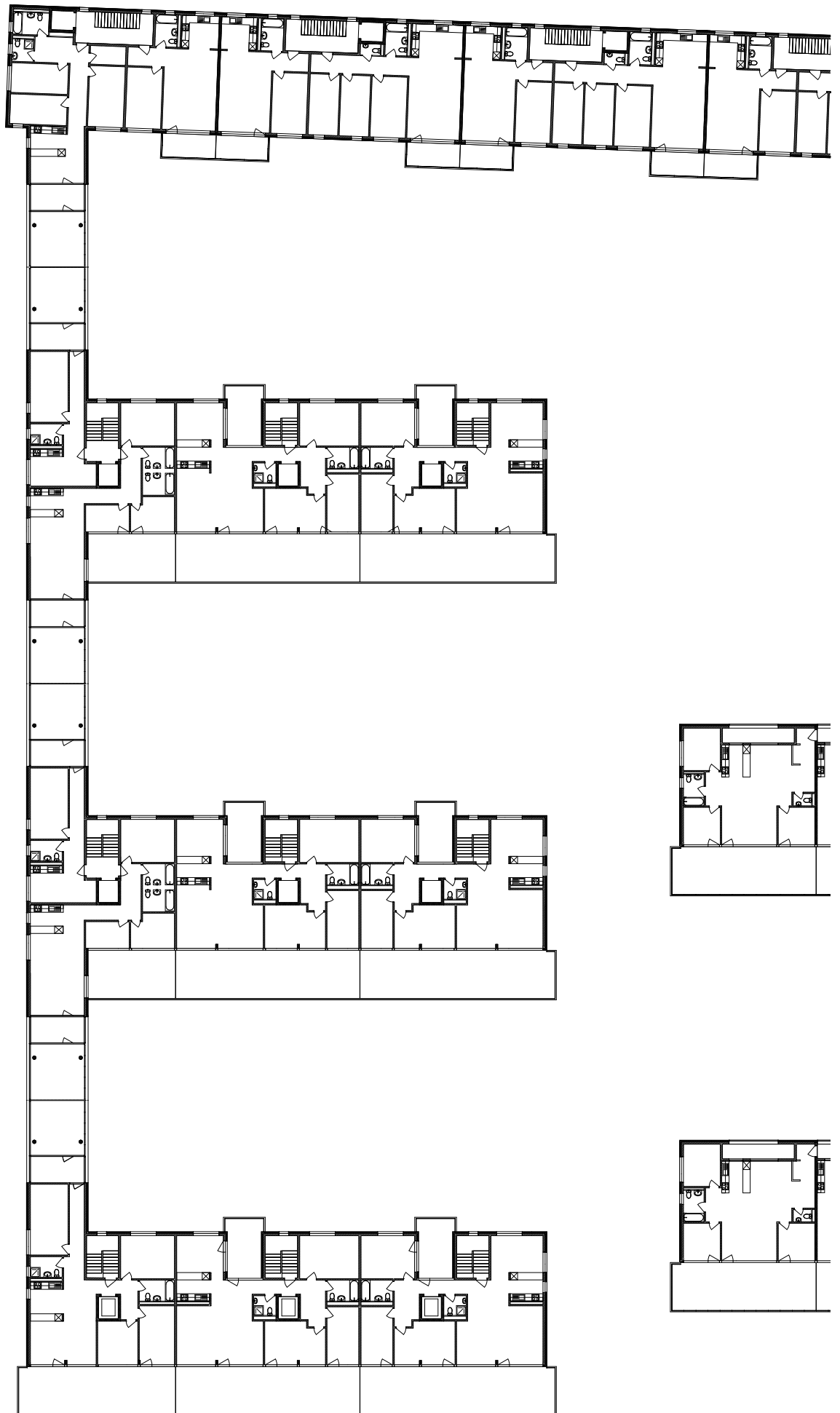


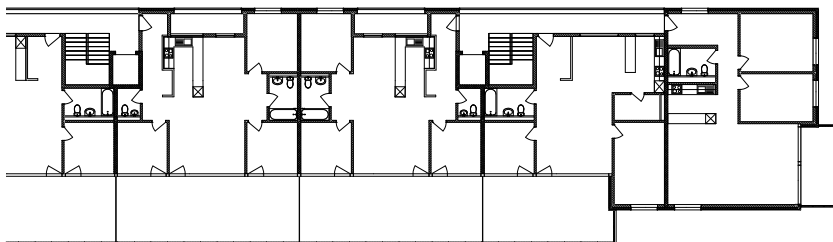
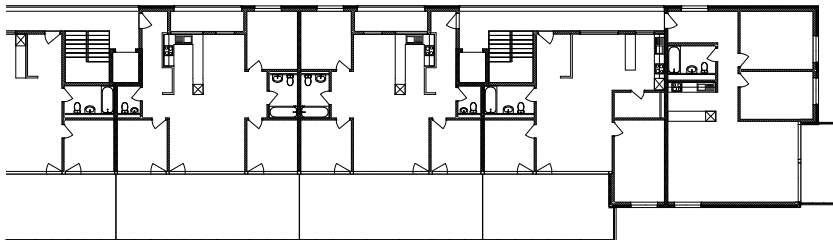
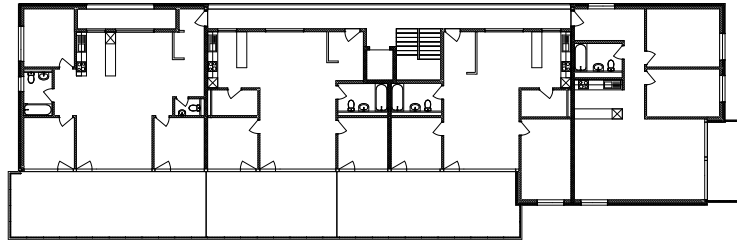
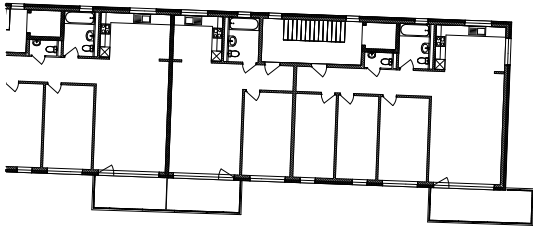




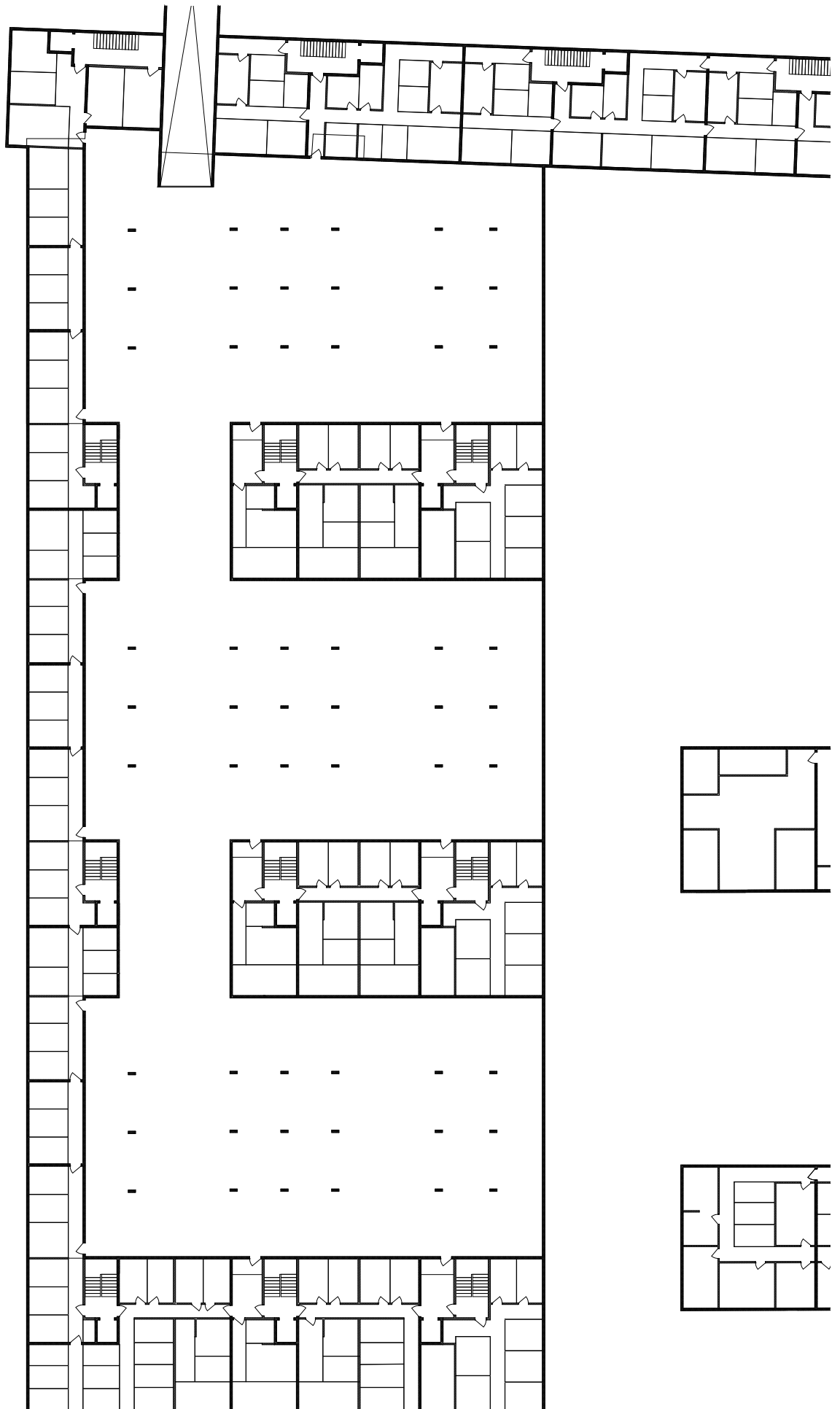


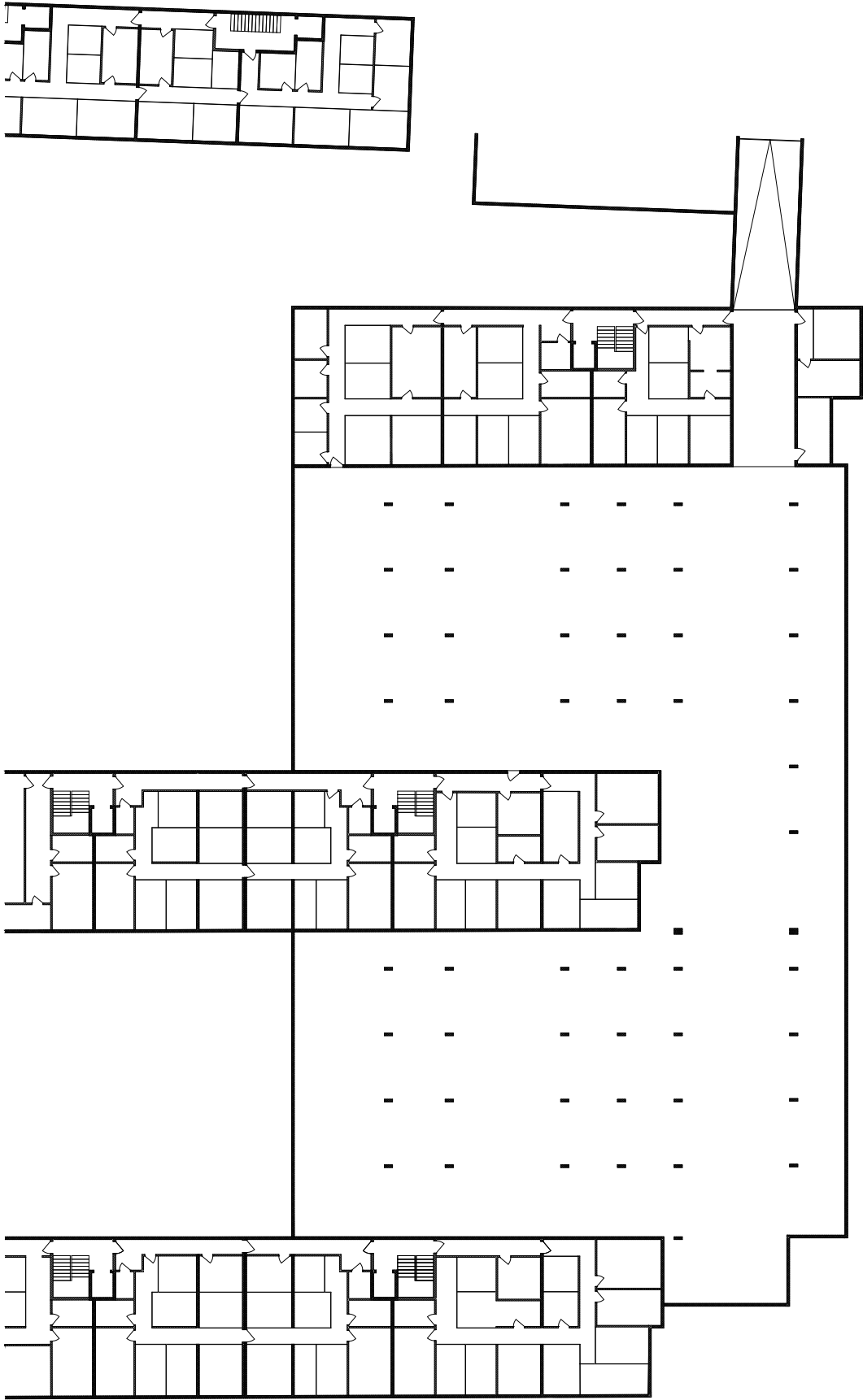














## **The Apartment**

*Living inside the Micafil Housing Complex comes with its own perks and problems. All apartment units follow the same logic and are identical over all floors. The units are on the spacier side and are flooded with natural daylight from the completely glazed south facade. On the contrary, the remaining windows are small and leave kitchen and secondary rooms with little light.*

*Climatically and acoustically the house lacks insulation and therefore exposes its residents to noise and high temperature differences over the course of a year. Also privacy proves as a difficulty inside the complex, as the ground floor apartments all face pathways while in the upper floors the balconies add as a filter with the screens added illegally by the residents.*

*The used materials are standardised over all of Bachmanns developments as they proven popular in the property market of the early 2000's. The market dictates the architecture and no changes were made to the original blueprints until local laws requested adaptation.*



Screens to create Shadow and Privacy





Living Room on third Floor



Kitchen facing North

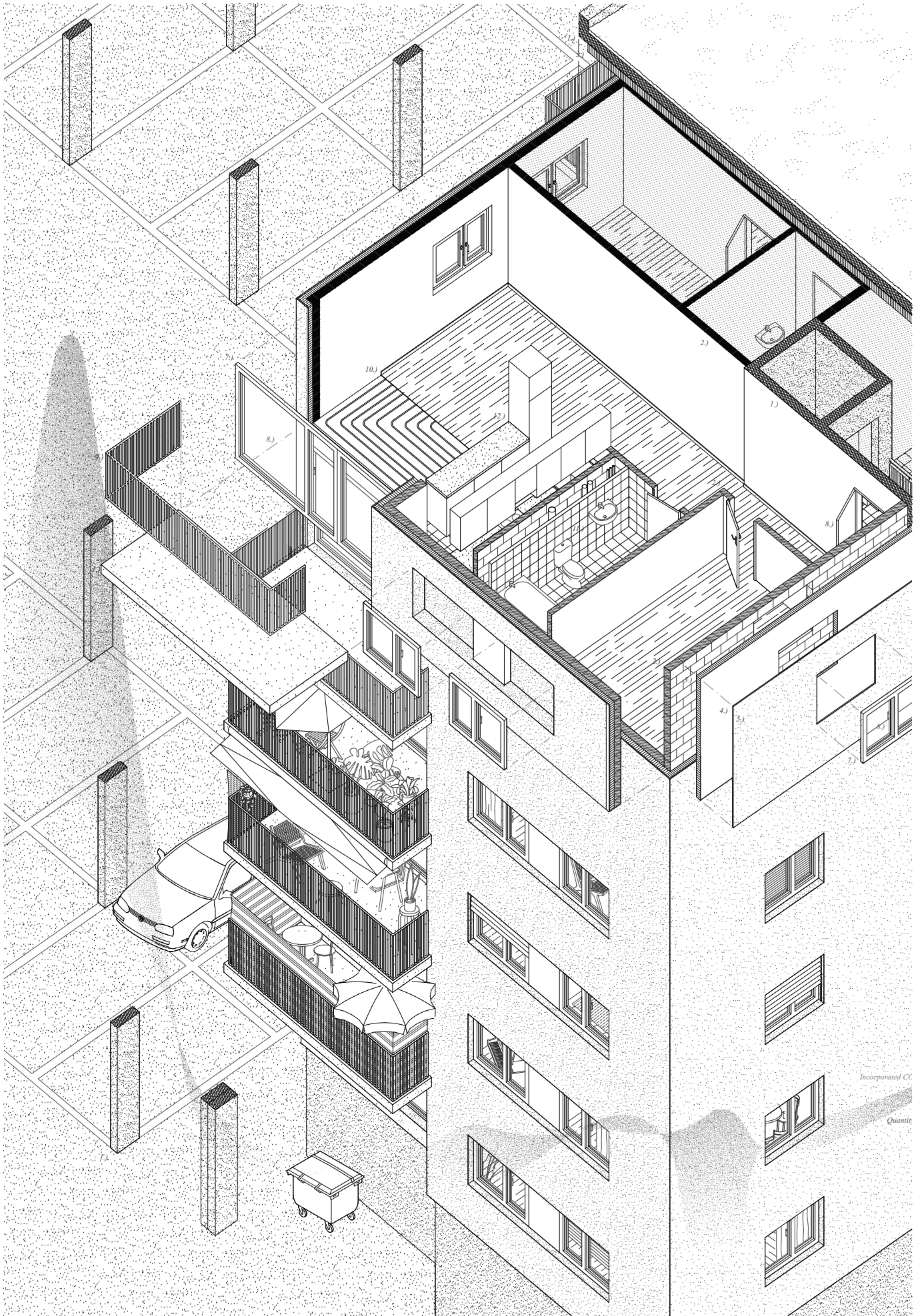


Bedroom with glazed Facade



<b>Bodenbeläge</b>	Keramische Bodenplatten in Küche / Bad / Dusche Teppichböden in Zimmern / Wohnen
<b>Wand und Deckenbeläge</b> Zimmer / Wohnen Bad / Dusche / Küche	Wände Abrieb, Decken Spritzplastik Keramische Wandplatten bis ca. 2m Höhe, darüber Abrieb, Decken Spritzplastik
<b>Briefkasten</b>	Gemeinsame Briefkastenanlage ( gemäss Vorschriften Post ) kombiniert mit Gegensprechanlage.
<b>Heizung</b>	Zentrale Heizung und Warmwasseraufbereitung ( Gas / Wärmepumpen ) Niedertemperatur Fussbodenheizung mit Thermostatregelung in jedem Zimmer.
<b>Vorhangbretter</b>	Spanplatte mit Kunststoffolie weiss, alle Zimmer 2 Vorhangschienen, Küche / Bad 1 Vorhangschiene.
<b>Schliessanlage</b>	Sicherheitsschliessanlage mit 3 Schlüsseln pro Wohnung.
<b>Elektrische Installationen</b> Telefon / TV Beleuchtung Ventilation	Sicherungen für die Wohnungen im Spiegelschrank im Bad. Anschluss im Wohnzimmer Lampenanschlüsse in Decken resp. geschaltete Steckdosen. Lampen bei Spiegelschränken in Bädern, und Dampfzug in der Küche. Entlüftung der innen liegenden Bäder, WCs und Küchen mit Ventilation über Dach.
<b>Küchen</b>	Forster Einbauküchen mit grossem Kühlschrank und Tiefkühlteil, Geschirrspüler und Glaskeramikherd. In Kleinküchen und Büros 121 Lit. Kühlschrank, keine Geschirrspüler
<b>Waschen / Trocknen</b>	Waschküche im Untergeschoss mit Waschküche und Tumbler.
<b>Aufzugsanlagen</b>	behindertengerecht in allen Häusern.
<b>Allgemein</b>	Der Baubeschrieb und die beiliegenden Pläne erheben keinen Anspruch auf Rechtskraft. Der Bauherr behält sich Änderungen während der Bauausführung vor.

Original Indications for all Components to use



Incorporated CC

Quantit

## Embodied Emissions

*Embodied emissions tend to be elevated in cost-effective building standards as in the case of the «Micafil Areal». Low-cost materials exhibit lower quality characteristics, which can lead to increased energy consumption during the buildings operational phase, thus offsetting the initial cost savings and contributing to heightened embodied emissions. The manufacturing processes associated with these materials often rely on older, less energy-efficient technologies, further amplifying the carbon footprint.*

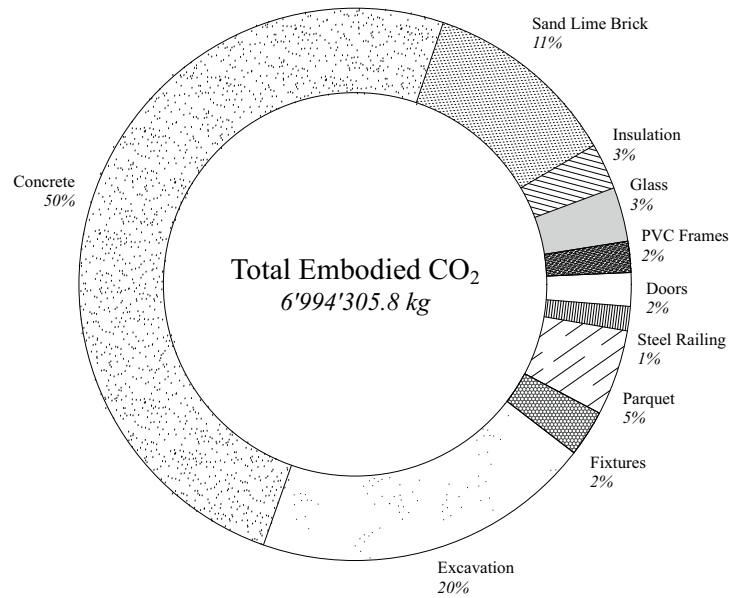
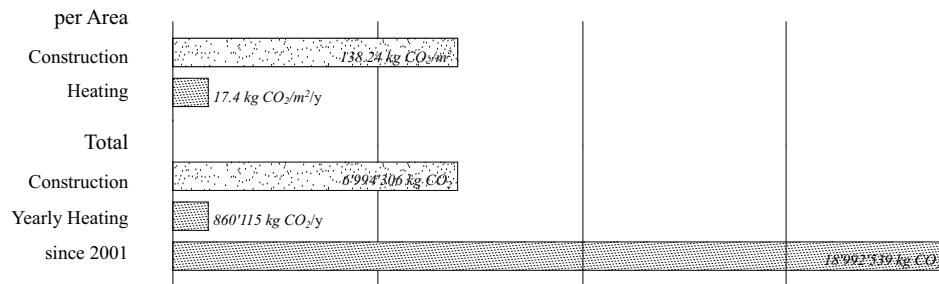
*Cheaper materials often come from more distant sources, intensifying emissions linked to transportation logistics. These materials are typically sourced with less consideration for sustainability, utilising resources from less environmentally responsible origins. They are also less inclined to incorporate recycled content or possess recognised eco-certifications that validate their suitability for a conscious architecture.*

Material	Weight	Quantity	Volume	Kg CO <sub>2</sub> per Unit	Incorporated CO <sub>2</sub>
Excavation	41'935 t	-	29'081 m3	52.98 kg	1'540'748 kg
Reinforced Concrete	34'147 t	-	14'228 m3	272 kg	3'870'013 kg
Sand Lime Brick	5'958 t	-	4'256 m3	208.6 kg	887'802 kg
Insulation	45 t	-	1'123 m3	180.4 kg	202'646.93 kg
Mortar	216 t	-	140 m3	0.96 kg	134.38 kg
Paint	3 t	-	94 m3	0.92 kg	86.03 kg
Glass	347 t	-	526 m3	45.7 kg	24'032.11 kg
PVC Frames	39 t	1988	263 m3	53 kg	13'935.47 kg
Doors	83 t	1527	98 m3	62.09 kg	152'639 kg
Steel Railing	38 t	-	5 m3	22'892.28 kg	112'246 kg
Parquet	46 t	-	526 m3	-720.18 kg	-378'957 kg
Sanitary Fixtures	28 t	564	5 m2	49.16 kg	27'729 kg
Kitchens	24 t	256	-	93.27 kg	191'026 kg

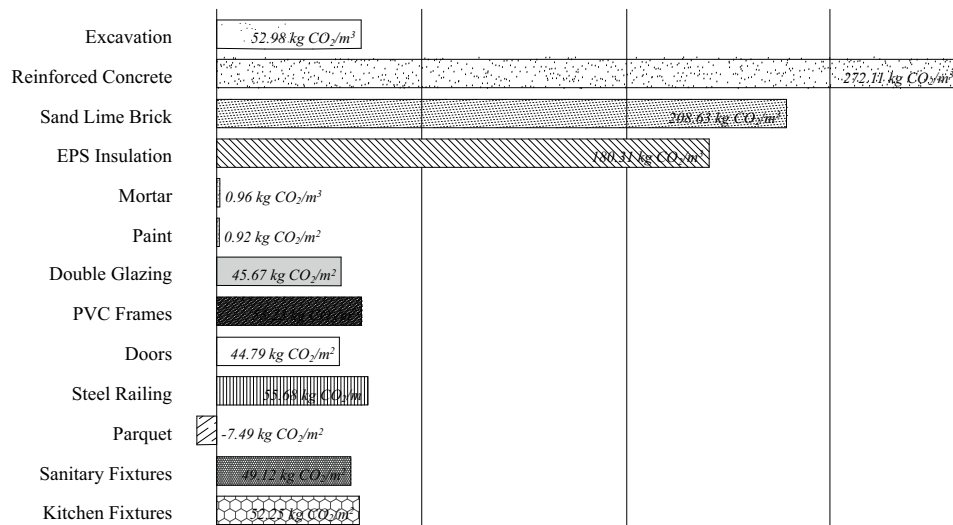
Components and Embodied CO<sub>2</sub>



## Embodied vs Operational CO<sub>2</sub>



## Material CO<sub>2</sub> Footprint per Unit



## Material Catalogue

*Embodied emissions are not just to be seen as a negative thing. More than that, it can be seen as a number that adds value to existing components by not only referring to its monetary worth. This promotes reuse and more sustainable practices in architecture.*



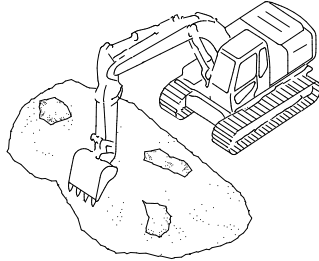
Status Quo: Demolition as the Common Practice

# Inventory

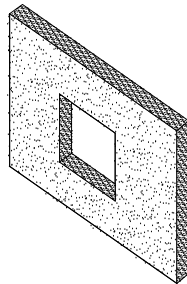
For 247 Apartments

(No Community Spaces included)

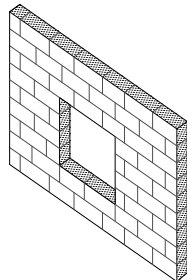
29'081 m<sup>3</sup>  
Excavation  
(52.98 kg CO<sub>2</sub>/m<sup>3</sup>)



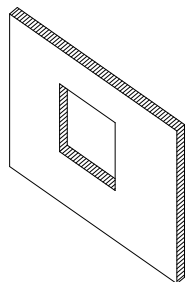
14'228 m<sup>3</sup>  
Reinforced Concrete  
272.11 kg CO<sub>2</sub>/m<sup>3</sup>



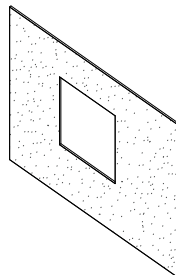
4'256 m<sup>3</sup>  
Sand Lime Brick  
14'547 m<sup>2</sup> - 10 cm  
15'910 m<sup>2</sup> - 18 cm  
208.63 kg CO<sub>2</sub>/m<sup>3</sup>



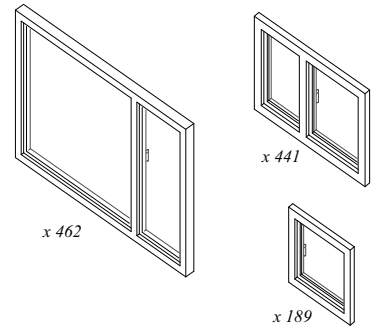
1'122 m<sup>3</sup>  
EPS Insulation  
9'631 m<sup>2</sup> - 12 cm  
180.31 kg CO<sub>2</sub>/m<sup>3</sup>



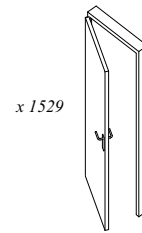
5'259 m<sup>2</sup>  
Facade Finish  
Mortar  
0.96 kg CO<sub>2</sub>/m<sup>2</sup>  
Paint  
0.92 kg CO<sub>2</sub>/m<sup>2</sup>



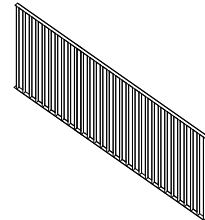
5'259 m<sup>2</sup>  
Windows  
Double Glazing  
45.67 kg CO<sub>2</sub>/m<sup>2</sup>  
PVC Frames  
53.23 kg CO<sub>2</sub>/m<sup>2</sup>



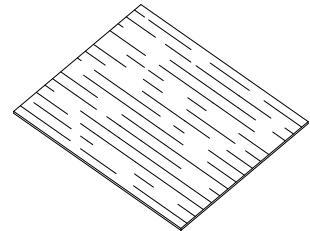
2'458 m<sup>2</sup>  
Doors  
Wood/Steel Frame  
44.79 kg CO<sub>2</sub>/m<sup>2</sup>



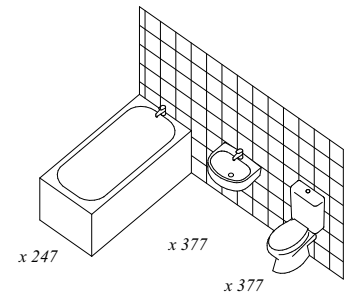
2'016 m  
Steel Railing  
55.68 kg CO<sub>2</sub>/m



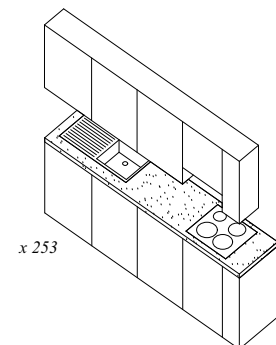
50'595 m<sup>2</sup>  
Parquet  
-7.49 kg CO<sub>2</sub>/m<sup>2</sup>



5'546 m<sup>2</sup>  
Sanitary Fixtures  
49.12 kg CO<sub>2</sub>/m<sup>2</sup>



10.) 2'048 Elements  
Kitchen Fixtures  
52.25 kg CO<sub>2</sub>/unit





## Demographic & Density

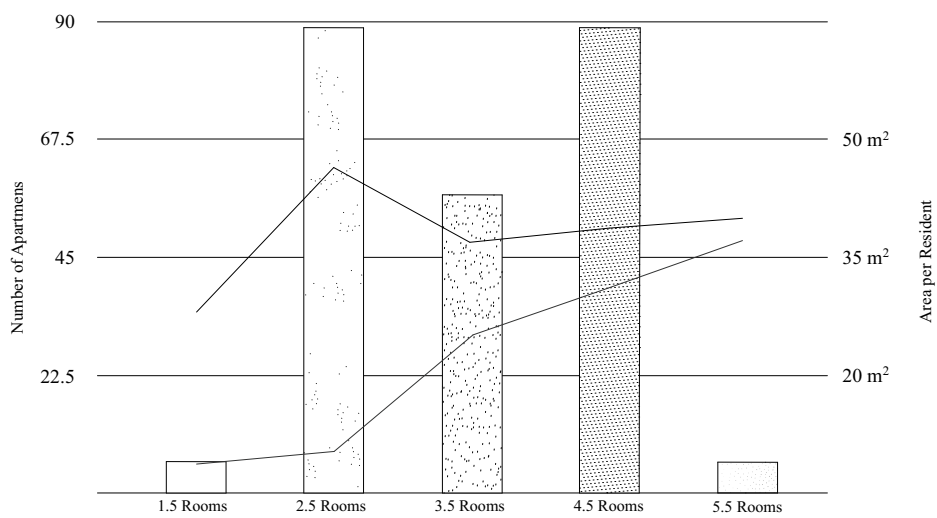
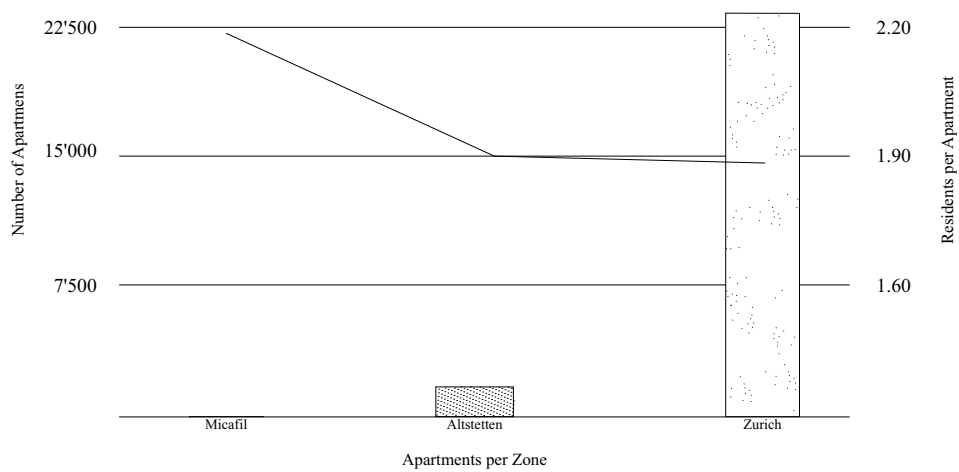
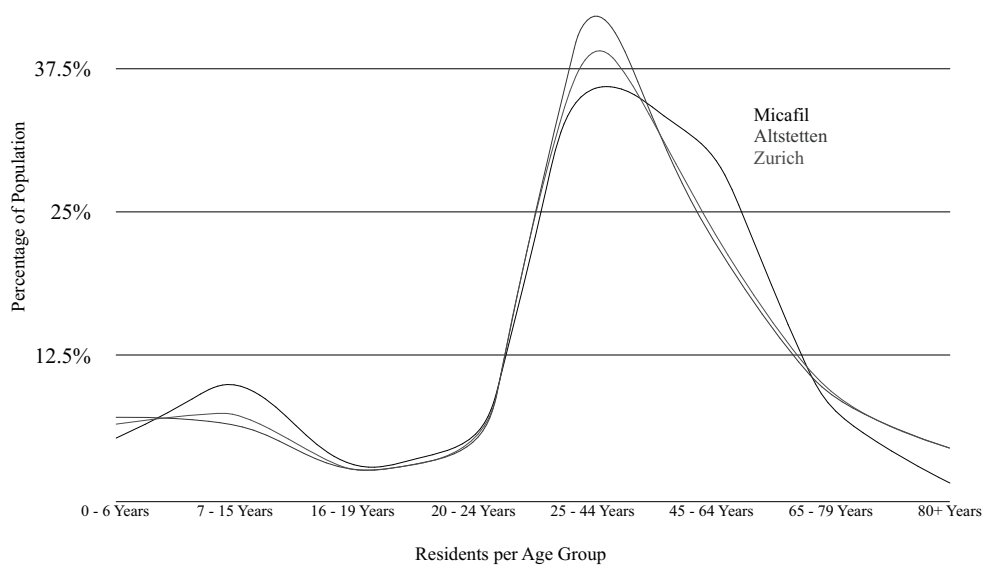
Over 500 people live in the «Micafil Areal» as data suggests. Especially many young families moved originally to the complex as many bigger apartments were built. This is still the case and there is a significant higher number of 7-15 year olds than compared to the city or Altstetten. Another trend is the low number of young professionals, who in general flock more to the center, compared to the elevated percentage of people around their 50's.

Even though many apartments are used below their capacity, the occupancy is higher than in the rest of the city by more than a fifth.

This density is generated more than anything in the bigger apartments which make up most of the 247 apartments. With the increase of livable area a significant decrease of area per person is observable which can be traced back to the numerous families with multiple children in the compound.

	Micafil	Altstetten	Zurich	Micafil
Population	538	35'642	441'397	538
0 - 6 Years	5.4%	7.2%	6.7%	29
7 - 15 Years	10%	6.7%	7.5%	54
16 - 19 Years	3.2%	2.8%	2.8%	17
20 - 24 Years	5.9%	5.4%	5.8%	32
25 - 44 Years	35.9%	41.5%	39.6%	193
45 - 64 Years	29.9%	22.7%	23.7%	161
65 - 79 Years	8%	9.1%	9.4%	43
80 + Years	1.7%	4.7%	4.5%	9
Seniors	13.5%	19.8%	20.1%	73
Youth	25.9%	24%	24.7%	139
Women	49.6%	48.6%	49.7%	267
Foreigners	24.5%	37.7%	33.1%	132
Apartments	247	18'733	233'744	247
<b>People per Unit</b>	<b>2.18</b>	<b>1.90</b>	<b>1.89</b>	<b>2.18</b>

Comparison Population of Micafil Areal, Altstetten and the City



## Interview

*During my first visit on site I met Ruth who lives in the housing complex since the very first day. After a short talk about the life on site and me forgetting to ask her for any contact information, I found her exact adress on the internet and sent her an invitation for an interview which she gladly accepted.*

*The following pages show the transcription and some impressions of the interview I conducted with her.*



Ruth's Living Room





## Questionnaire

10. October 2023

### Personal

Who are you and since when do you live here?

*My name is Ruth and I've lived here since 2000. I'm originally from Bern, was born in 1951 and moved to Zurich in 1987.*

What brought you to Zurich?

*I moved here for a job opportunity and now I am staying as a pensioner.*

### Macro

What do you like about your neighbourhood?

*I like the scale, diversity, my young and older neighbours, but especially my apartment on the top floor with its big terrace. \*laughs\* One summer I slept on the balcony when it was warm at night. This is also just possible because I live up here and feel safe outside.*

Talking about enjoying the neighbourhood, are there any negatives of living here?

*The only thing that comes to mind is the trash collection point, which is constantly a mess. It's just one tiny area for all of the apartments. Some people just put their trash bags and broken furniture next to the bins. Ah and I almost forgot! In 2014 they did some major renovations which were a nuisance to everybody.*

How did the construction affect you?

*Well, my apartment was entirely painted new, because I had a crack up there \*points at the ceiling in the living room\* and the landlord was worried about leakage. Nothing happened in this house though. The neighbouring roof was showing signs of leakage at the same moment and they started to fix the whole thing.*

Did it have a big impact on your life?

*They were working for two months and it felt like forever. They were lifting tons of materials up with a crane once they stripped the whole roof and it was very noisy as these apartments aren't really soundproof.*

Is this the only negative memory you have of living here?

*I actually think so.*

Great to hear! Do you have a favourite memory after living in this very apartment for 23 years?

*My favourite moment is whenever my grandnieces come and visit. They love the playground and I also think that is really great. It is just so nice, they especially love the colourful seesaws.*

The playground did not exist when people initially moved in, do you know when and how it came to be?

*Yeah, we had to fight to get it!*

How long did the negotiations take place?

*Something like 4 years! And it seems stupid, especially when you see how frequented it is nowadays. There were so many families with kids from the first day but I figure kids don't pay rent and don't matter therefore!*

### Social

Do you know your neighbours?

*Next door lives a young woman, who I barely see to be honest. I only hear the door open and close, that's all. On the other side I have a young couple who is currently traveling for a year and I water their plants since they did not sublet. One floor below, on the 4th floor lives Mrs. Langmeyer. She lives alone in a 4.5 room apartment. I know her since the first day and we talk daily. We saw each other in the lift in the morning when we both went to work back then. Nowadays we do our grocery tours together and go get occasionally a cup of coffee near Lindenplatz. We really get along!*

It is nice to see that you maintain relationships of this kind over the years.

*Yes, I don't know if you noticed, how heavy the main door downstairs is. She could not even leave the house without my help at this point because she needs to use a walker. By the time she needs to open the door completely and go back to the walker, the door is already closed again.*

Apart from your downstairs neighbour, how many people live here as long as you?

*Not many. Seeing how often people come and go, you could get the idea that finding an apartment in Zurich was an easy task. There are a lot of changes.*

How long do people stay in general?

*It varies a lot but most who stay longer are families. Others move as early as they find a more central apartment.*

What do you think might be a reason for that?

*I mean in the end we are in Altstetten. Many still don't see it as a real part of Zurich. Another point is how isolated life here can be if you are not actively talking with your neighbours. We have no community spaces and we are also the only housing complex on this side of the train tracks.*

What types of community spaces would be used in your opinion?

*A common room would be enough to start off. Just to eat something with others, for kids birthdays or making little workshops together. That's missing. Perhaps it doesn't exist because it wasn't really popular back in 2000.*

Zurich is actually pretty experienced in including community spaces in their large scale residential projects. But these are led by housing cooperatives or the city itself which is not just profit-driven. Do you feel any of this solely profit-oriented strategy as a resident?

*Of course! Not directly as my rent has stayed the same since I move in but you can see it looking at the materials used or that there are apartments even in all ground floors where people pass by all the time.*

*Micro*

What do you like about your apartment?

*It is roomy and very bright, I like lots of natural light. Even though in the summer this is a drawback. It gets terribly hot to a point I flee several days into the mountains. This year I stayed there for a whole week as it was unbearable. But for the price I can deal with that*

Are there any other negative aspects?

*Well there was... When first moving in everybody had cheap rug instead of parquet but people were not taking it as it was smelling artificial \*sniffles\* almost toxic. They brought in the cheapest parquet soon after and I heard, that they even managed to sell the carpet to minimise losses.*

Would you change anything?

*I would love to have more light in the kitchen since it is quite dark. Other than that I would only wish it was more comfortable in summer and winter.*

Talking about comfort. Are there more and less comfortable spots in your apartment?

*Depending on the season it changes. In summer the shadier areas away from the facade are more pleasant to be at. It is less obvious in winter but then you can feel how cold the glazed facade gets.*

What is your favourite spot?

*\*laughs\* Actually, here at this very table. I can look outside from here. I also have the TV which I can watch sitting here. I use my laptop here, bring out my sewing kit if I have to fix something - I do everything at this table.*

Would you be open to share this table or rooms like the kitchen and bathroom with others?

*I never thought about it, but I think some people waste a lot of space. Some of my friends my age have a bedroom, office plus a room just to hang and iron their clothes. I would be open to share living spaces and a kitchen with others! I think it could enrich everybody's life. The only thing is that I would love to still have a private bathroom and kitchen in case I don't want to talk to anybody. You know, when you have just on of these days...*

Well, thank you for your time Ruth and to answer all my questions!

*Thank you for visiting!*



## Project Proposal

*Regarding my findings and valuing the existing material, as well as social matter, I propose to improve the living conditions with the implementation of climatic and acoustic buffer zones inside the existing building volume which is spacious enough. Other measures could be the addition of a volume to add common rooms with better climatic properties enabling the residents to profit from the diversity attracted by low rents.*

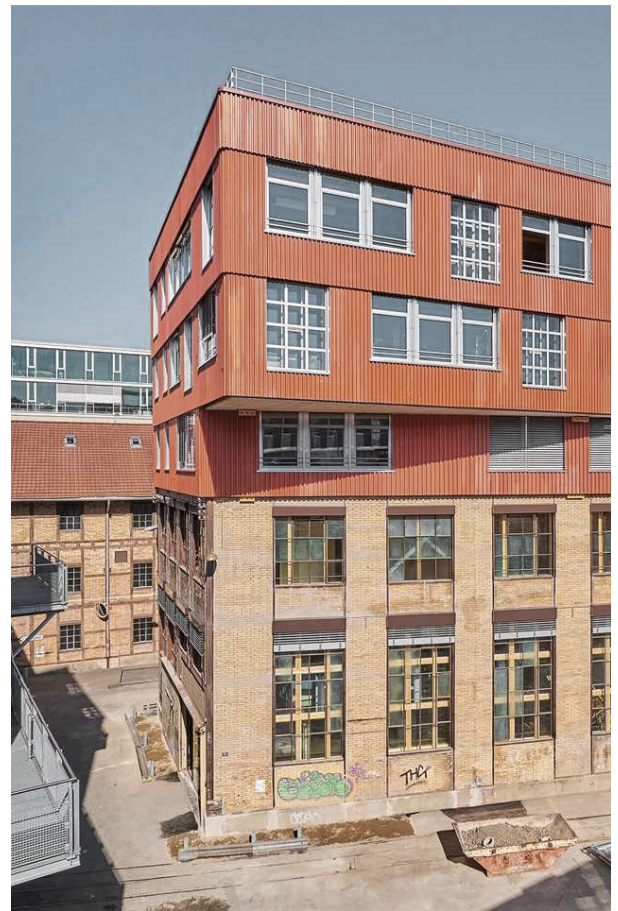
*This strategy could be coupled with reorganising apartments in cluster making them primarily living and private quarters which need less cooling or heating respectively.*



Implementation of Climatic Buffer



Implementation of Filter and/or Green Facade



Addition of Zones





**Colloquium**  
*Master Thesis*

**17. Oct 2023**  
*Rolf Imseng*

**HS23**  
*Studio Emerson*







