



Hospital* for the Earth

*In colloquial terms the hospital describes a place where ill people are cured. It comes from the Latin hospitalis, 'hospitable' (hospes, hospit) and means to host a guest, the reception of a stranger. In the early past, it was a place for the poor because the rich were treated at home.

Can we imagine these meanings together?

Maybe it 's too late to protect -
maybe we have to heal the Earth

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A

What has happened so far*

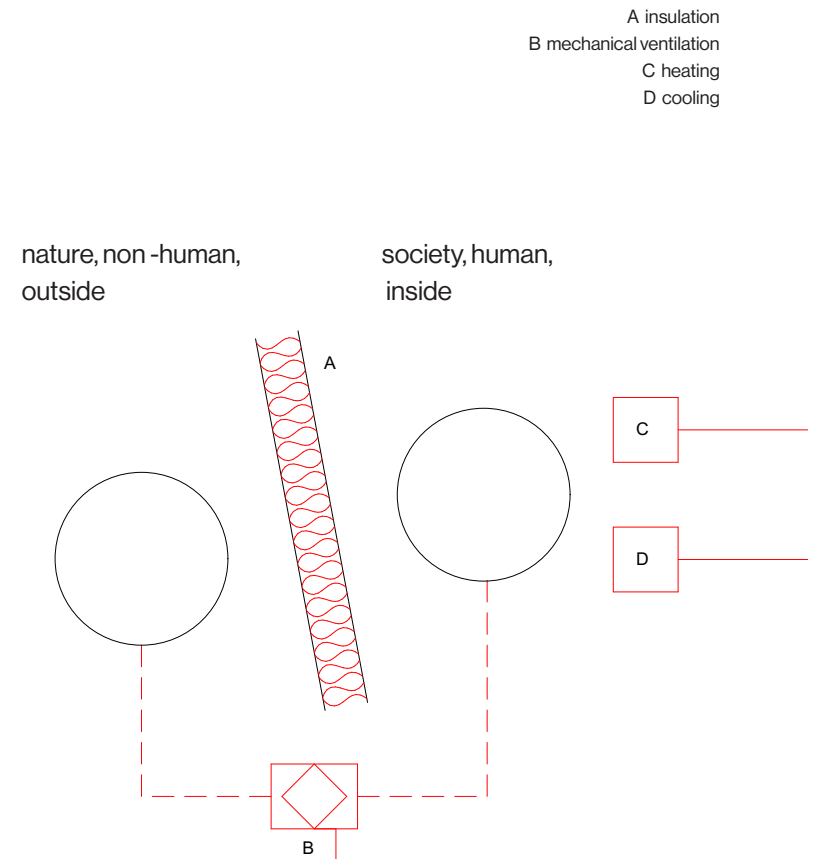
*in the climate crisis

We (modern humans) have built uncountable houses all over the (modern) world. These (modern) houses form inside spaces which are detached from their surroundings. In the beginning, this separation was a modern dream. We have made an enormous technical effort to create tight envelopes, mechanical ventilations and technical heating or cooling systems. Nature has only been a reliable background of human actions in this story.

Having settled in controlled inside spaces we believed our human world to be independent from what we called the natural world.

For a while we have taken the basis of our existence for granted. But in the climate crisis we realise that its very basic components are affected by us and affect us. It has become clear that our way of living is only possible at the expense of the Earth.

So this separation became a necessity. The Earth had to be protected from the harmful human impact - from ourselves. By improving the efficiency of insulation, mechanical ventilation, heating and cooling we tried to minimise the traces of our life, to make ourselves invisible in an ecological sense, to live as ghosts in this world - from a dematerialised distance.

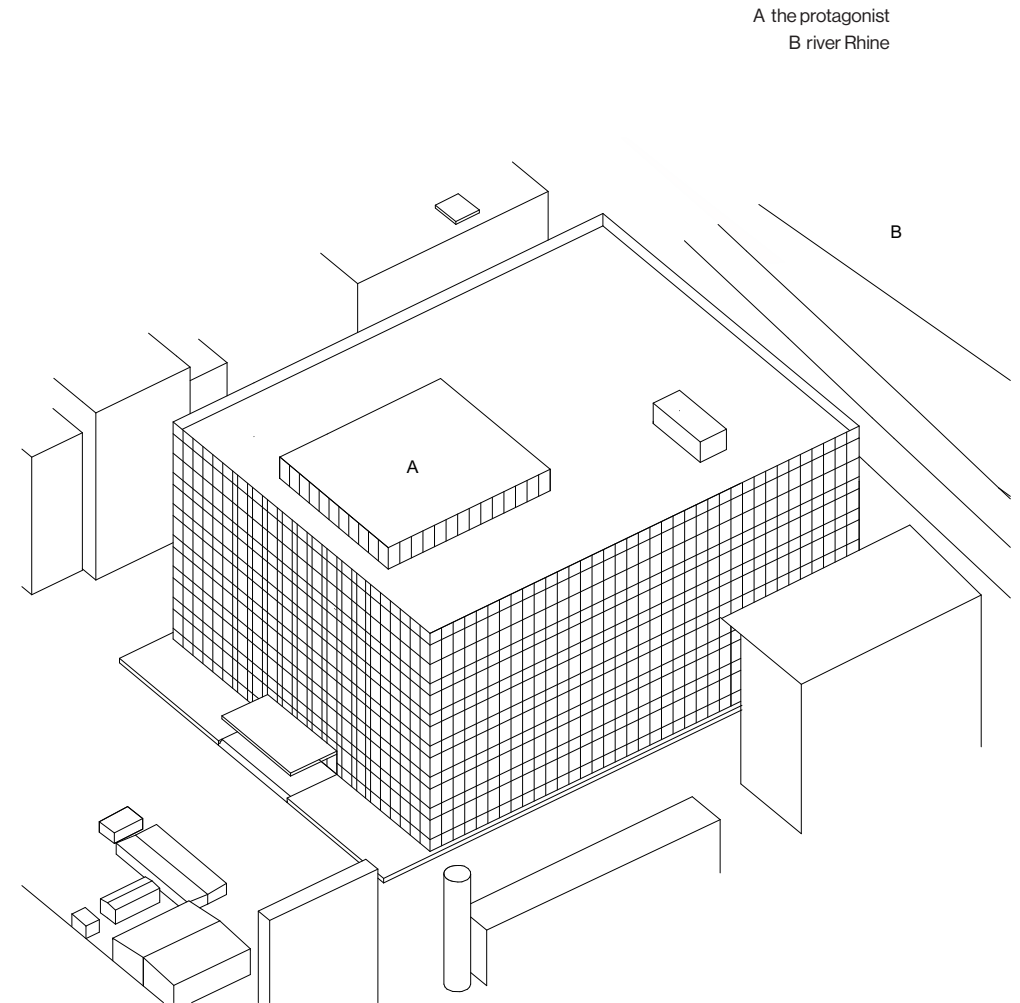


*based on the "Two House Collective" diagram by Bruno Latour

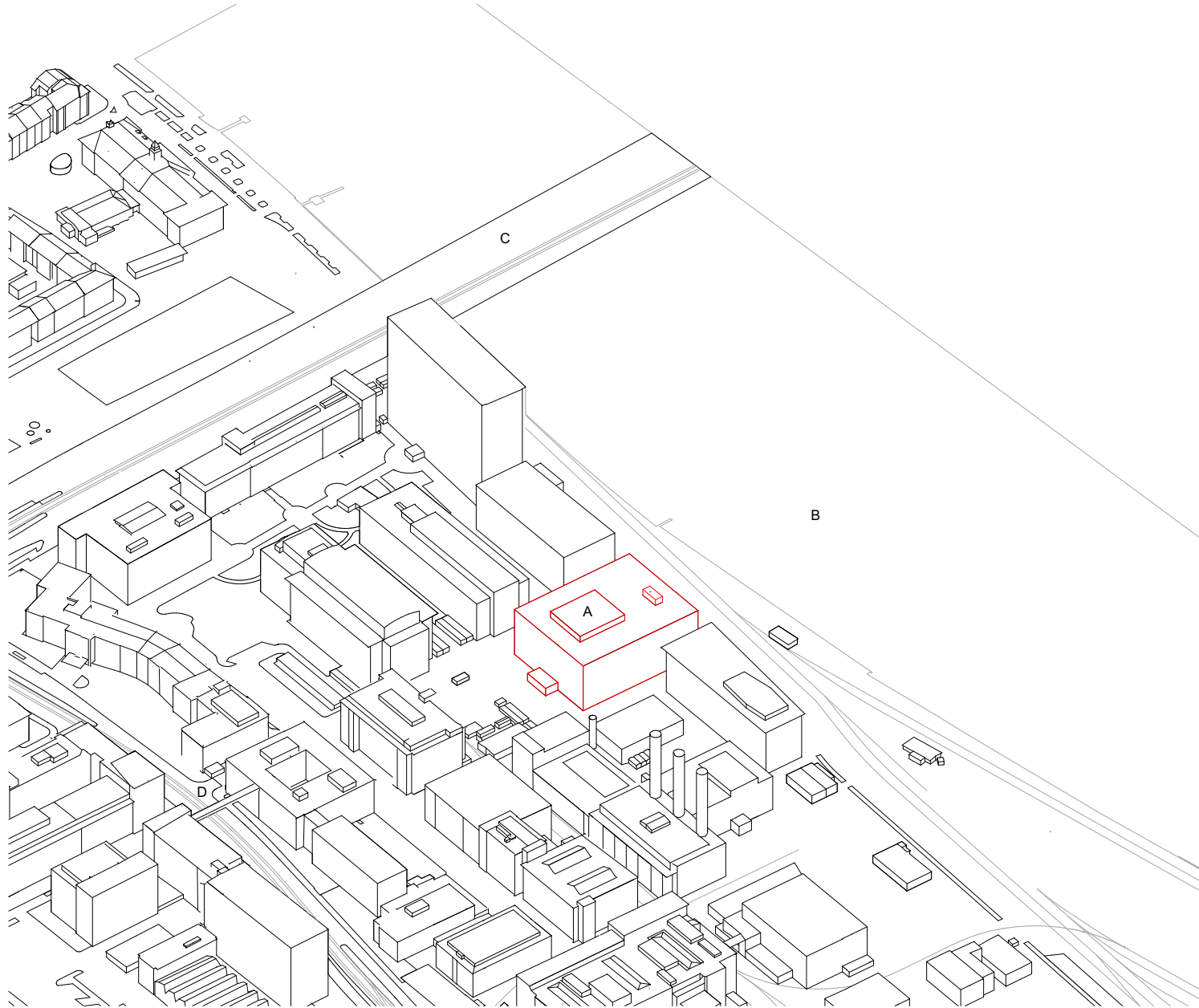
The protagonist

The main character of this story was built in the time of modern dreams. It is called B127. Since 1973 it was used as a laboratory and office building. Before moving out, up to 600 people worked in 154 laboratories and additional offices. The building's structure is based on a strict office grid of 1,70 m with a column every 3rd unit (span of 5.10m).

It is situated in the north of Basel in a former industrial area in the district of Klybeck. Its west facade faces the Rhine river.



Axonometry existing



- A the protagonist
- B river Rhine
- C Dreirosenbrücke
- D Klybeckstrasse

Site plan



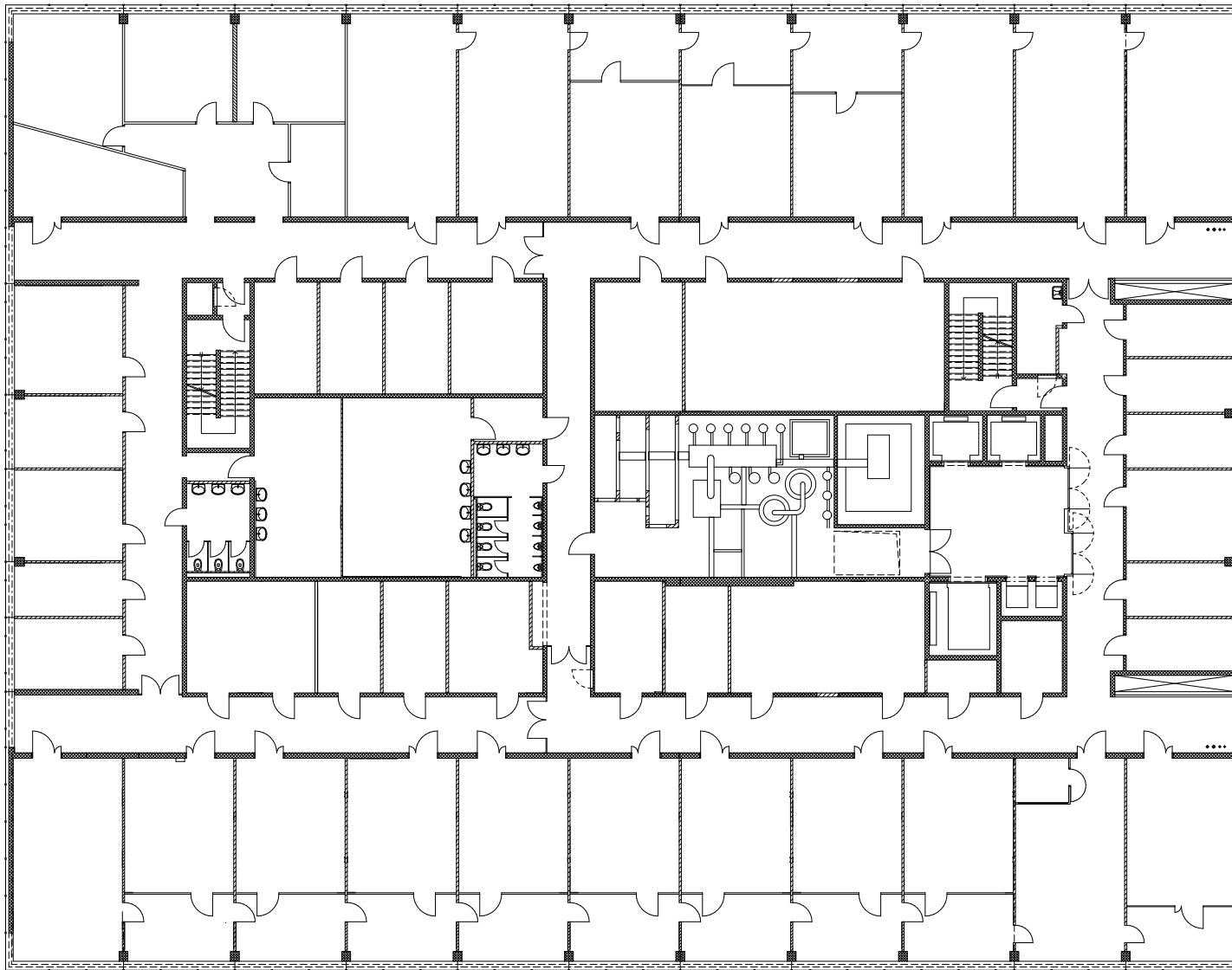




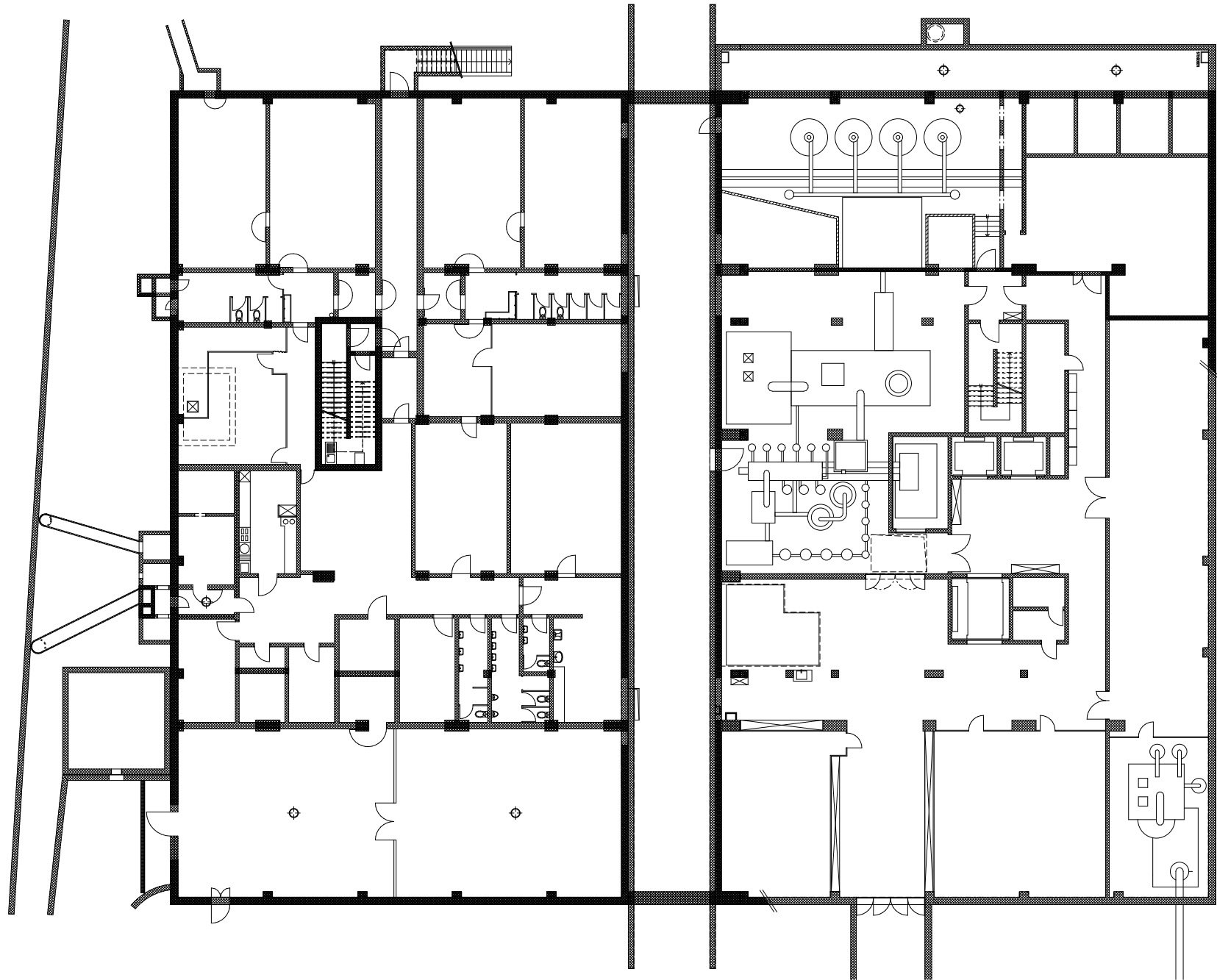




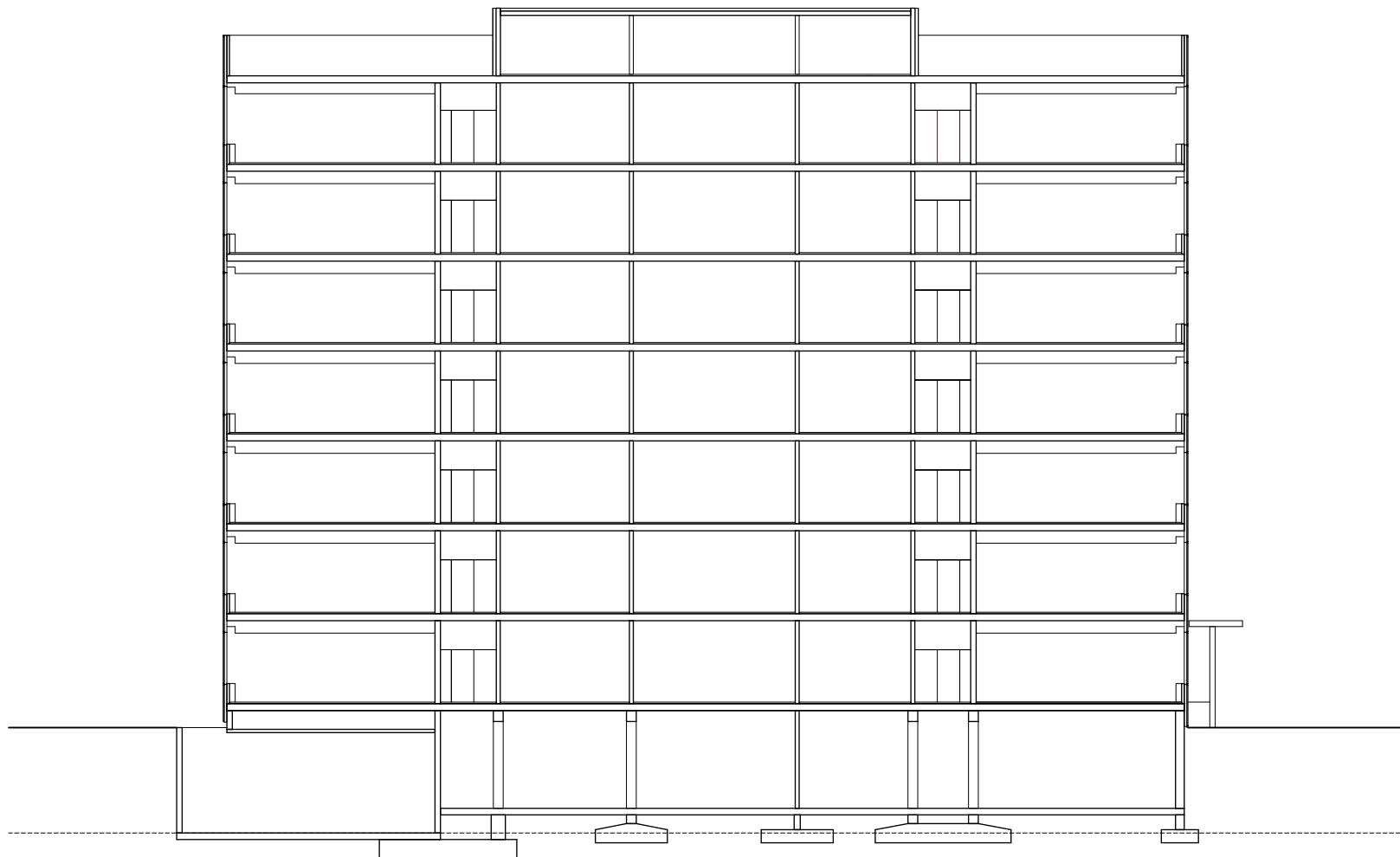




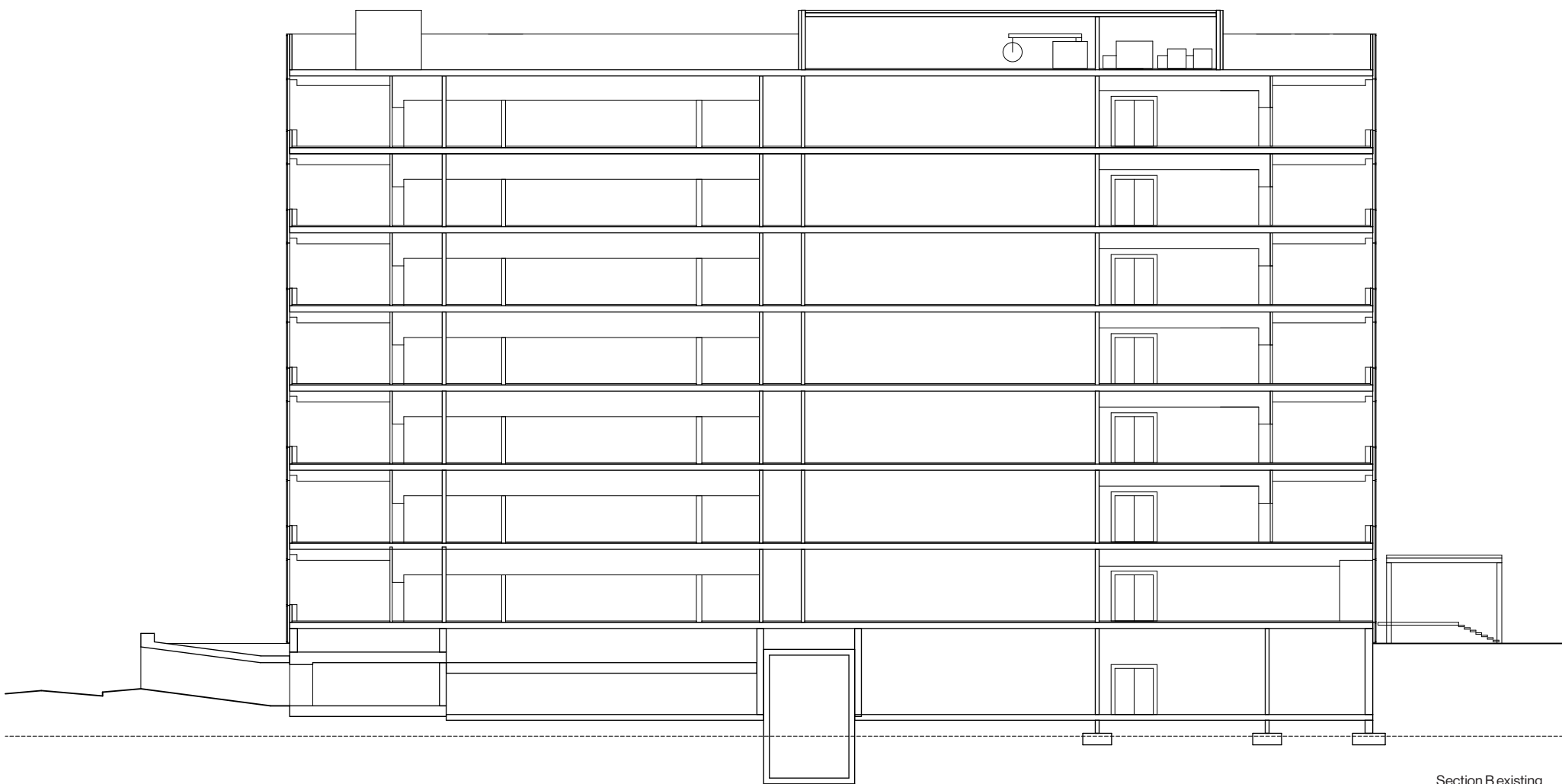
Standard floor plan existing



Basement floor plan existing



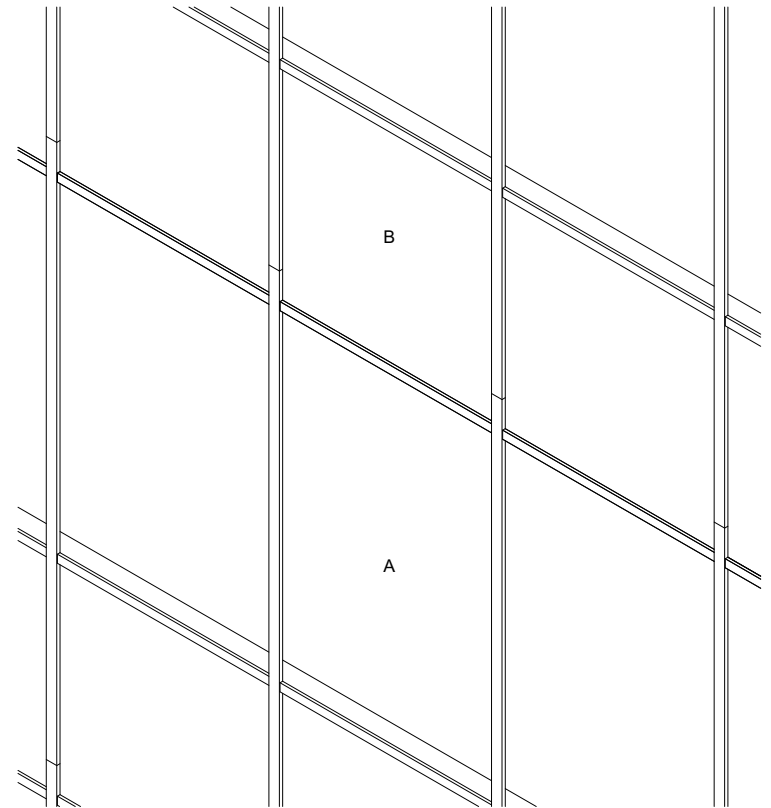
Section A existing



Section B existing

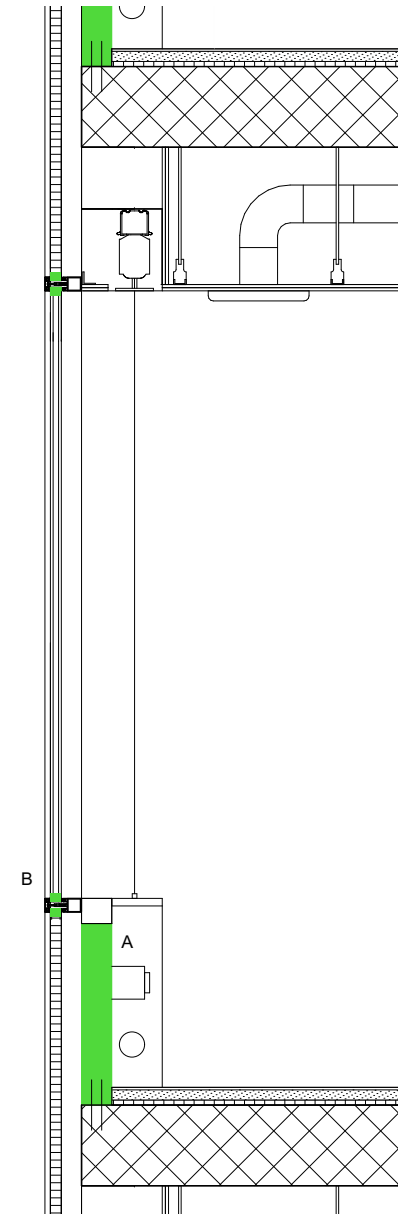
Like many other office buildings B127 has a mullion transom glass facade which cannot be opened. Although it looks very homogenous, it is divided into reflecting glass and opaque sandwich elements with an outer glass layer.

A insulating glass element
B insulating sandwich element



Axonometry facade

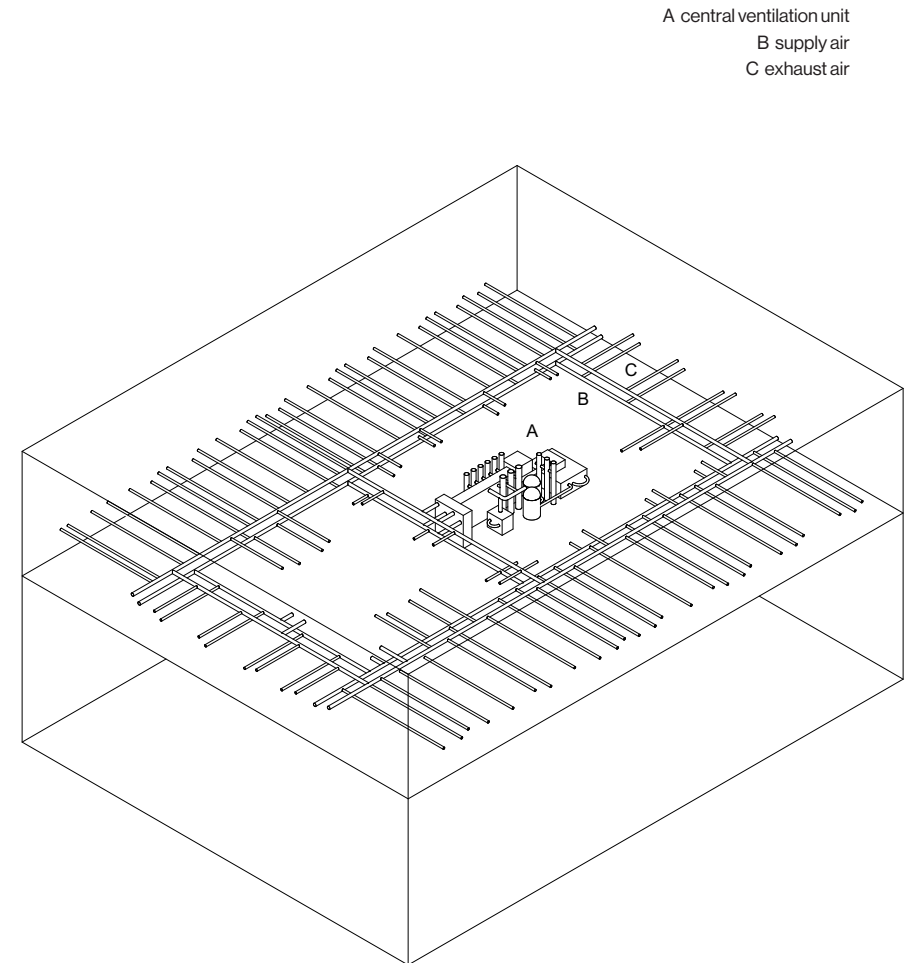
Parts of the facade are contaminated by asbestos. Our protagonist contains asbestos in the seals of the facade and in the concrete railing to prevent fire flashover from floor to floor. If released, this causes severe health problems, so that both elements need to be removed.



A precast concrete balustrade
B facade sealing
asbestos

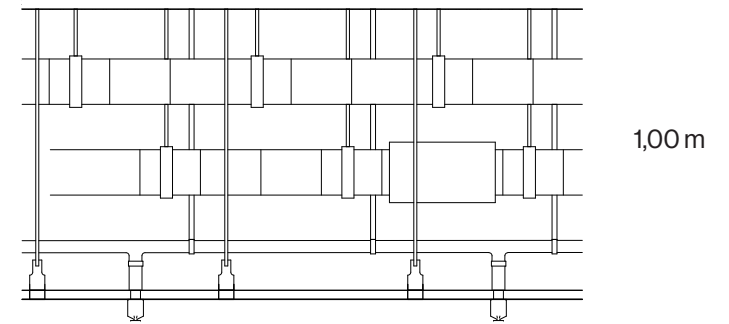
Section facade existing

To provide a closed inside with fresh and clean air, our protagonist B127 has a sophisticated mechanical ventilation system. It enables a fully controlled, constant inside. For chemical storage and experiments the system achieves air exchange rates of up to 30 times/h in special storage rooms and 15 times/h in all laboratories. Additionally, it is equipped with an elaborate air filter to clean the air from contamination.



Axonometry ventilation system existing

All the technical appliances are hidden above a suspended ceiling which lowers the room height by up to 1 m. The suspended ceiling consists of a grid structure to which lightweight boards are attached.



3,80 m

2,80 m

Section existing

What may become

What if architects asked whom to design for?

If we consider ourselves and our buildings to be part of a common Earth this would mean to live together with many different inhabitants. Our protagonist shows that life in a building that separates the inside from its surroundings to provide homogenous comfort for humans is not even as generous and pleasurable as we thought. Instead we could make the Earth a common concern for everyone. Then our protagonist could become a hospital for the Earth, which does not try to minimise its harmful causes but instead maximises its positive impact on the Earth.

All the capacities which were needed to separate from the environment can be re-used to contribute to it in a positive way. A hospital for the Earth is a place that cleans the water, filters the air, fertilises the soil, captures CO₂, hosts plants, accommodates animals - and ultimately enables generous and pleasurable human life.

When freed from its constraints to separate, our protagonist offers large extra spaces in deep rooms, high ceilings due to its open, large span structure. It functions with very little interventions. Instead its existing capabilities are reused to become passive systems which rely on interaction with all inhabitants as a common ecosystem.

The Hospital for the Earth may become a building which is part of the outside, enabling a new inside with no more outside. In this new inside many different actors co-inhabit the same common space.

B

The inhabitants

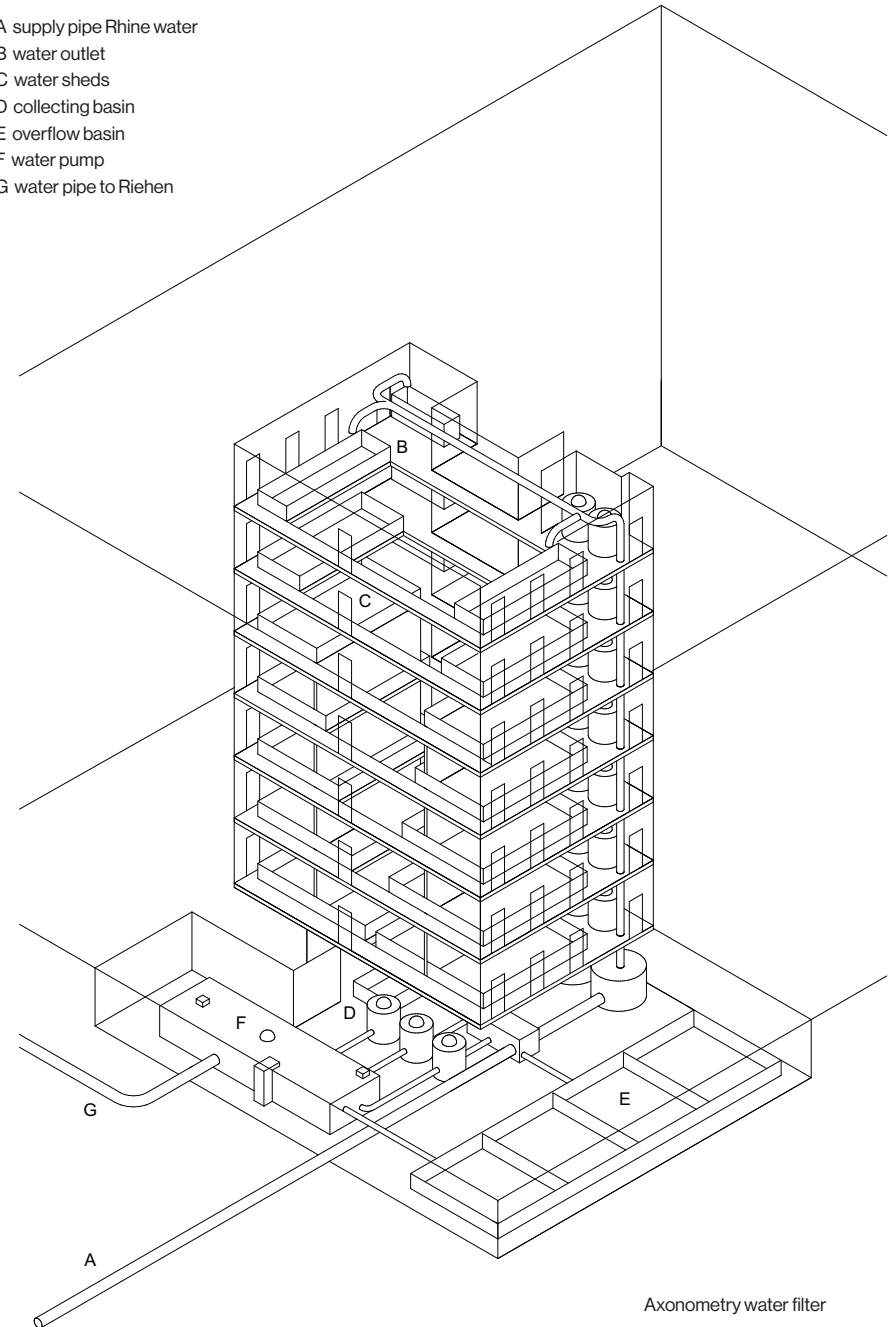
1.1 Water

Our protagonist was built next to the river Rhine. It is in the centre of an emerging city district to be built in the upcoming years. The area will require additional amounts of fresh and cleaned water. Even today, the groundwater in the city of Basel is not sufficient to supply everyone. It is therefore enriched with water from the Rhine. However, this must be removed and filtered.

In the past, the laboratories in our protagonist were cooled with Rhine water. For this purpose, it has a water pump and supply line from the river. The building is also located in the immediate vicinity of the Lange Erlen nature reserve, where the filtered Rhine water is already fed into the groundwater.

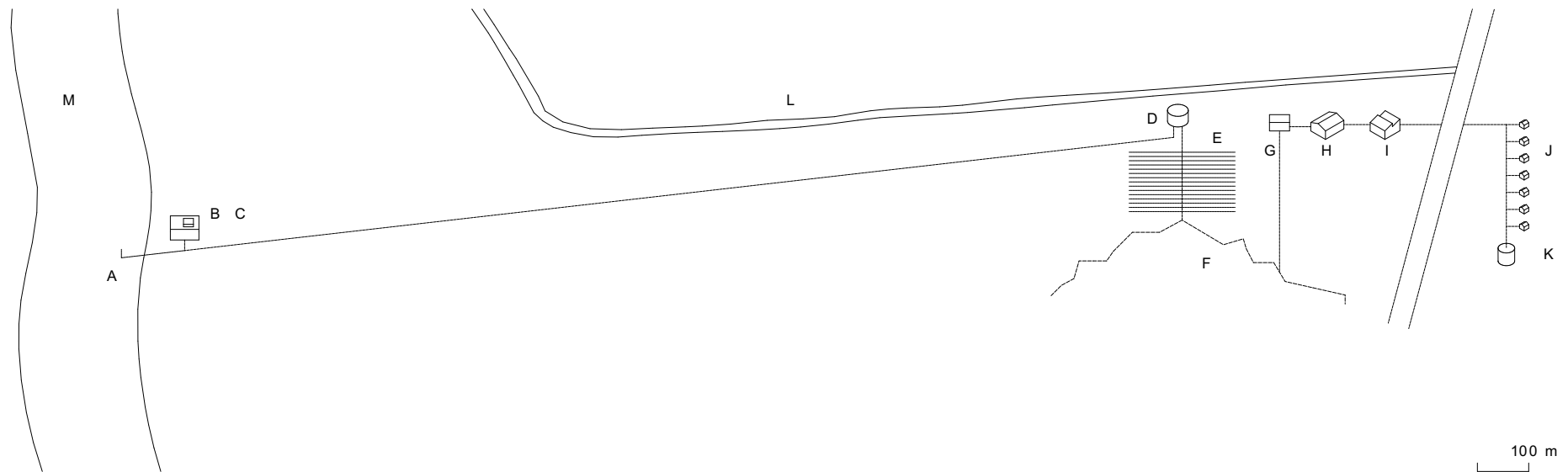
By converting the existing system, our protagonist becomes part of this water supply for the city of Basel. In the former changing room and sanitary core, which is no longer used after the laboratories have been abandoned, our protagonist receives a natural water filter system. The water is filtered via cascade-shaped water terraces filled with aquatic plants, microorganisms and quartz sand. A large pump in the basement transports the purified water to the Lange Erlen nature reserve.

- A supply pipe Rhine water
- B water outlet
- C water sheds
- D collecting basin
- E overflow basin
- F water pump
- G water pipe to Riehen



Axonometry water filter

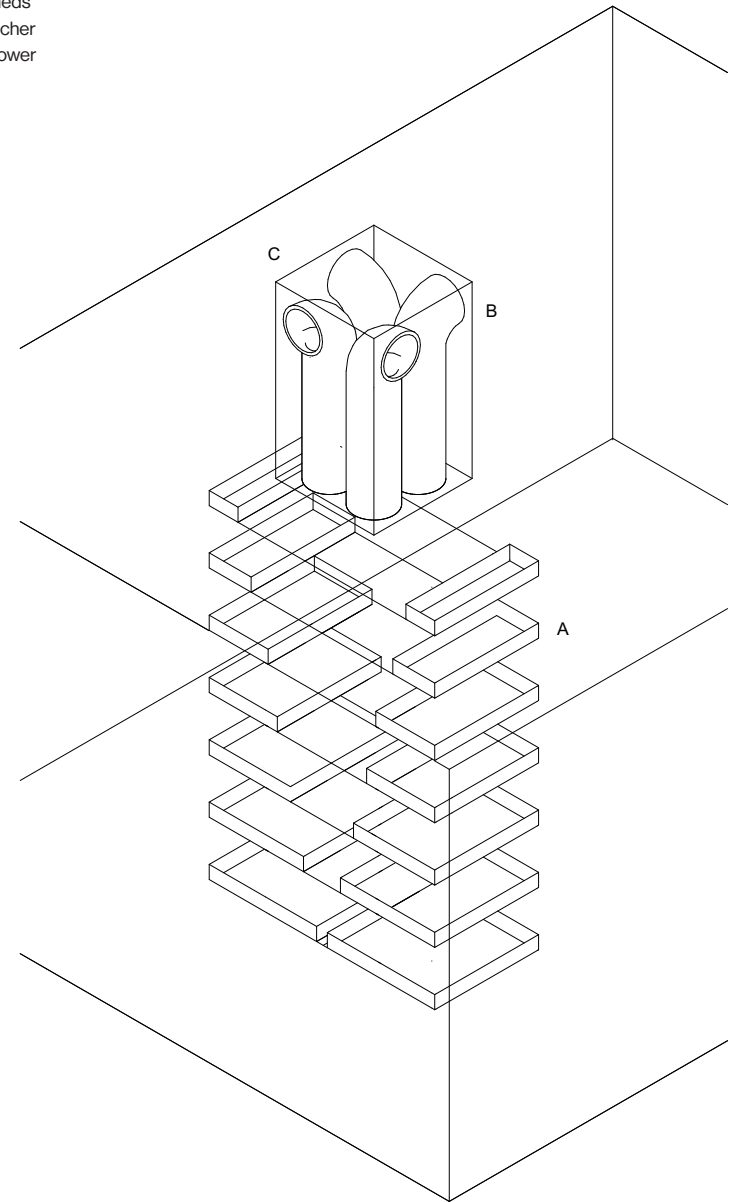
- A water abstraction rhine
- B rapid filter system
- C pipe water pumping station
- D watering place
- E forest soil
- F ground water
- G well
- H carbon filter plant, deacidification
- I pump station, UV disinfection
- J households
- K reservoir
- L river Wiese
- M river Rhine



1.2 Cold

In the natural Rhine water filter system water evaporates continuously. This is used to cool the building naturally. Our protagonist receives a wind tower above its water terraces. The trapped air cools down through evaporation and sinks towards the ground. Through the existing door openings, the cool air flows through the apartments to the outside. The air flow can be regulated by opening and closing the doors. Turbines in the wind towers generate electricity for the building.

A water sheds
B wind catcher
C glazed tower



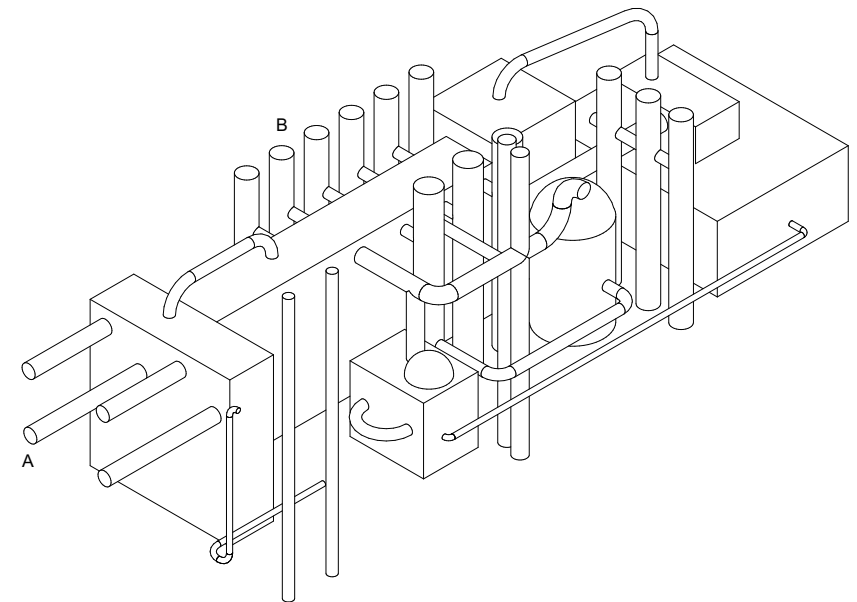
Axonometry natural cooling

1.3 Air

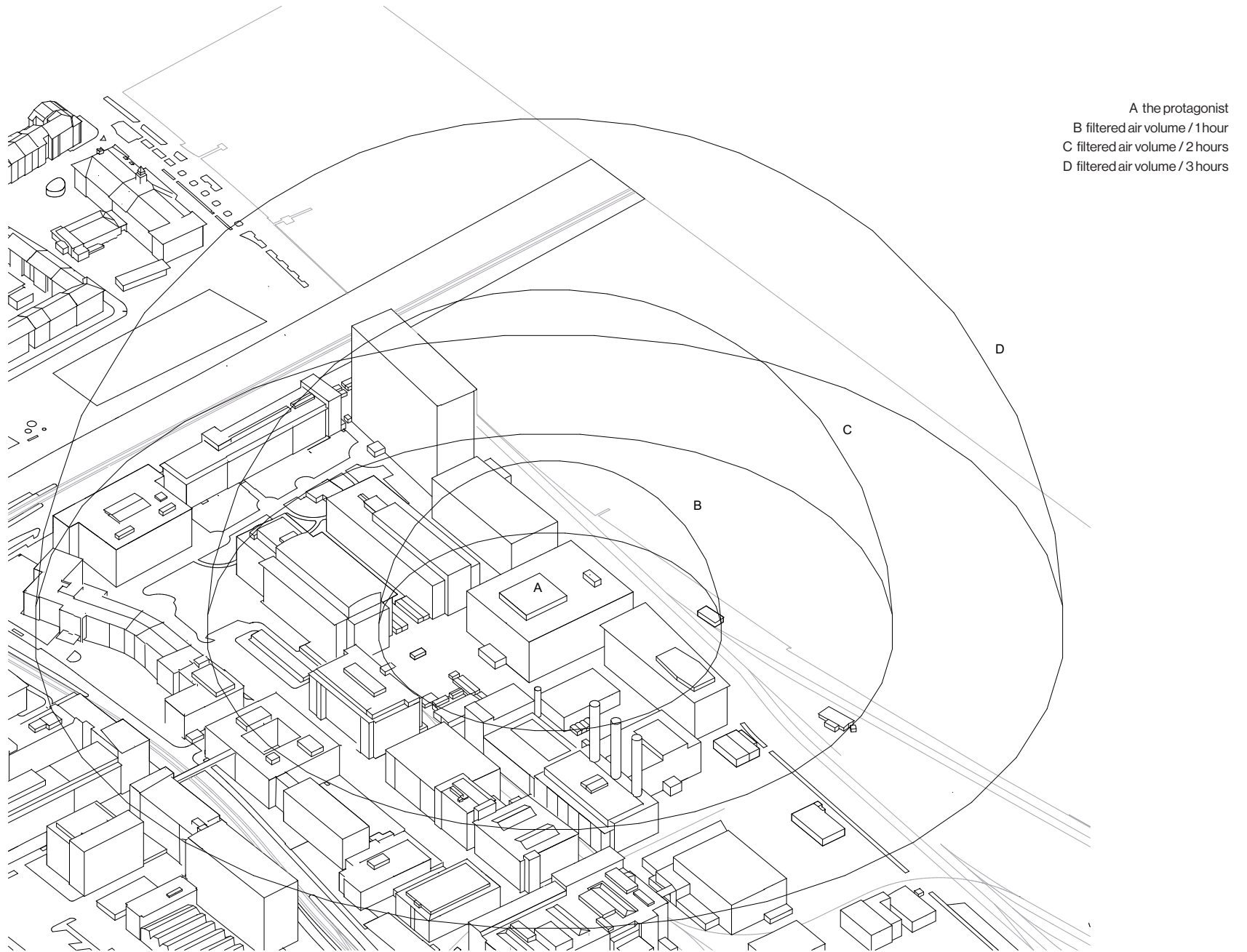
Due to the closed glass façade without external sun protection, our protagonist has a sophisticated ventilation system to cool the interior and supply it with fresh air. The laboratories and storage rooms for chemicals required a particularly high air exchange rate with a very powerful air filter.

Since the facade is replaced by opening sliding windows and the rooms can be cooled by a passive system, the existing ventilation system is highly oversized.

However, the building is located in an area of the city of Basel that has regularly exceeded contamination limits for fine air particles and ozone in recent years. The free capacity of the ventilation system is sufficient to completely filter the air of the planned quarter once every 3 hours.



A air supply for floor
B vertical air supply



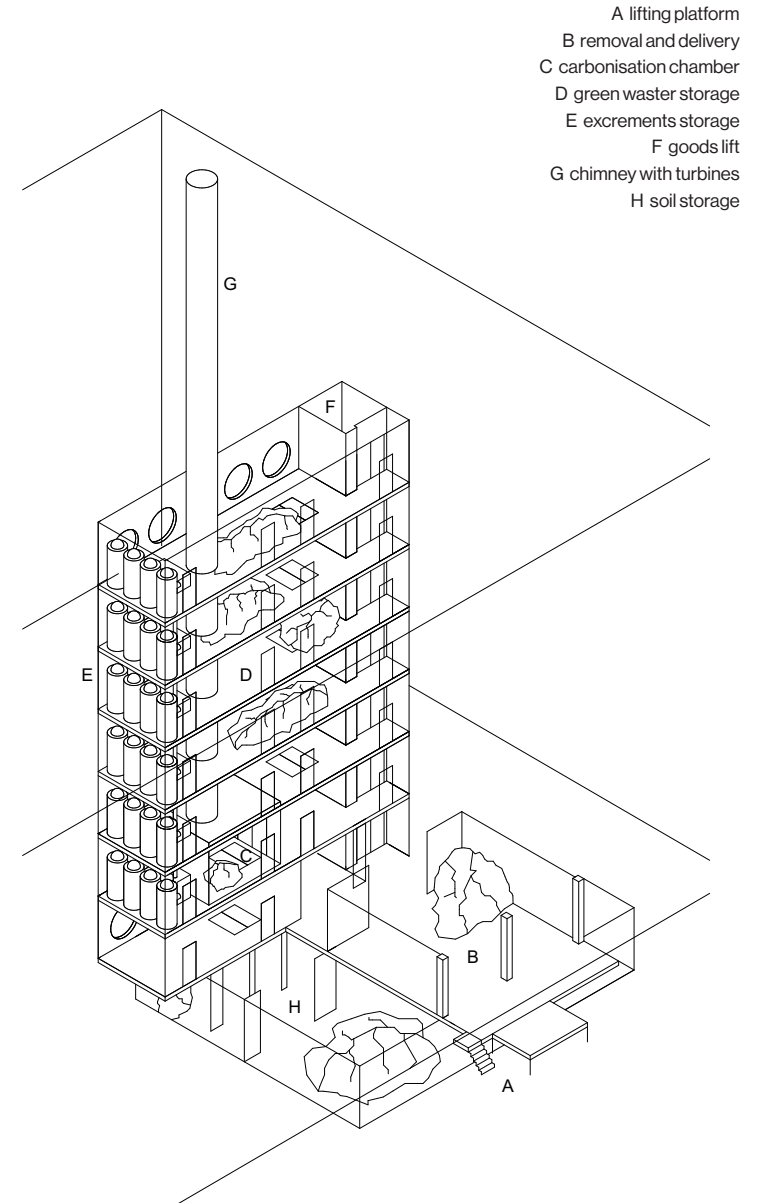
Axonometry filtered air volume

1.4 Earth

Our protagonist stands on the site of a former industrial zone for chemicals and medicines. The ground is strongly contaminated. It is planned to create a riverside park along the Rhine, in front of the building. Inside our protagonist, a few particularly special rooms have been built for the storage of chemicals and certain experiments.

In these rooms, our protagonist could produce fertile soil from the green waste of the park and the collected excrements of the residents by means of carbonisation. For this purpose, green waste and excrements are carbonised in the absence of air. The indigenous people of the Amazon have already used this technique to produce what is called Terra Preta.

By removing oxygen, carbon dioxide is hardly released during the carbonisation process, but is instead bound in the earth. In this way, our protagonist can produce fertile soil in its interior. It can be distributed to the contaminated areas of the former industrial quarter to allow for the re-introduction of plants and animals. And with the help of this technology, carbon dioxide can be stored in fertile soil for thousands of years.

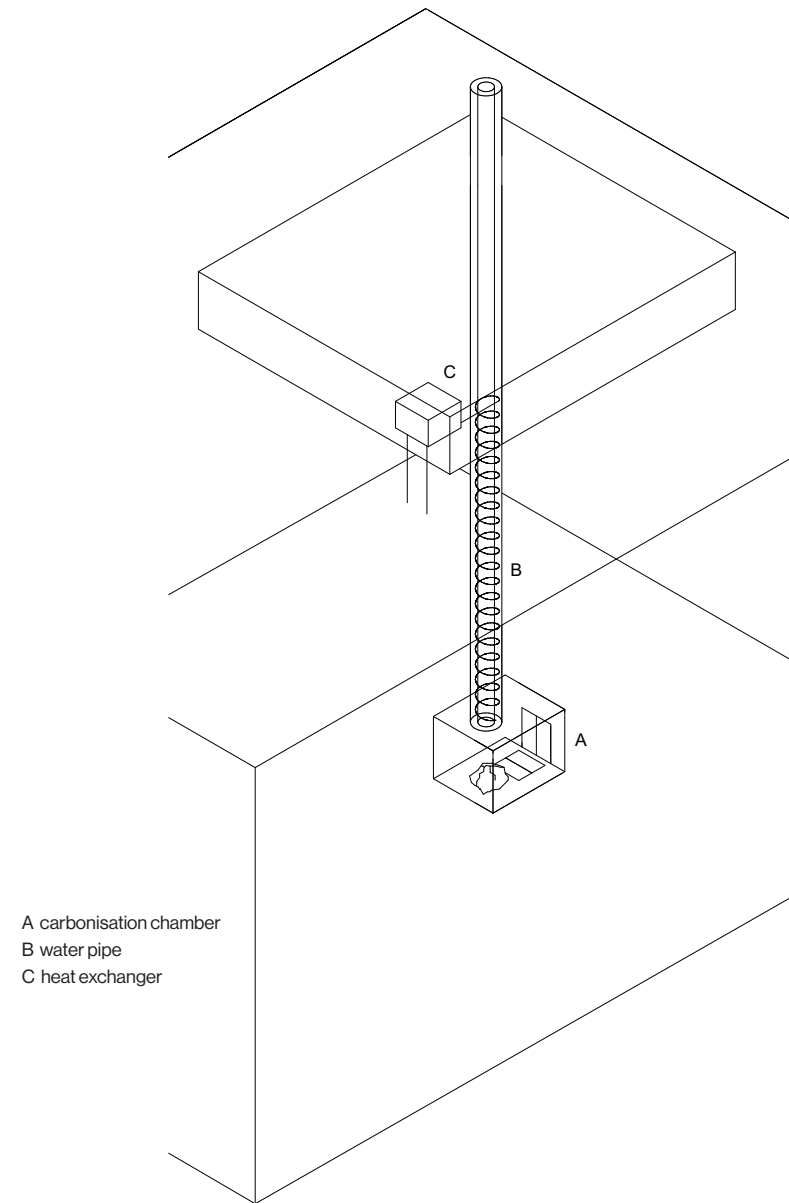


Axonometry carbonisation

1.5 Heat

The heat generated by the carbonisation process provides the inhabitants of the house and surrounding buildings with hot water and heating in winter.

A generator in the chimney produces electricity from the nevertheless produced exhaust gases, creating a small combined heat and power plant with a high degree of efficiency. The intensity of the carbonisation can be controlled according to need, thus compensating for the natural irregularities of electricity production with photovoltaic collectors. Both systems complement each other well, as the solar collectors generate a lot of electricity, especially in summer when little heat is needed, while in winter it is the other way round but sun radiation is low.

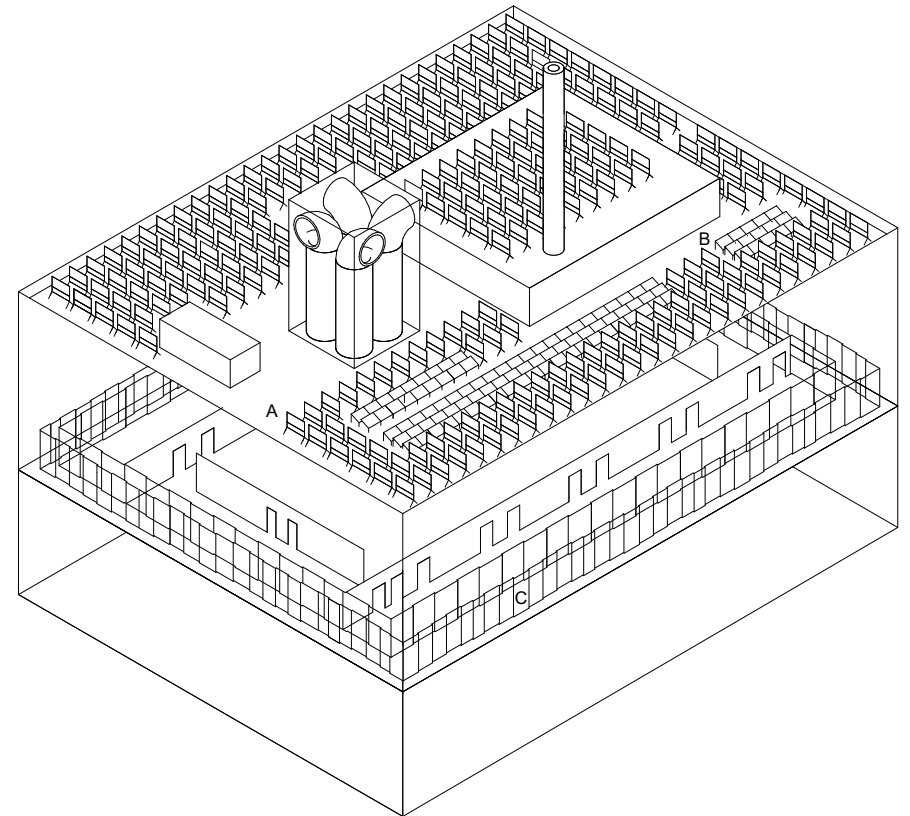


Axonometry heat recovery

1.6 Sun

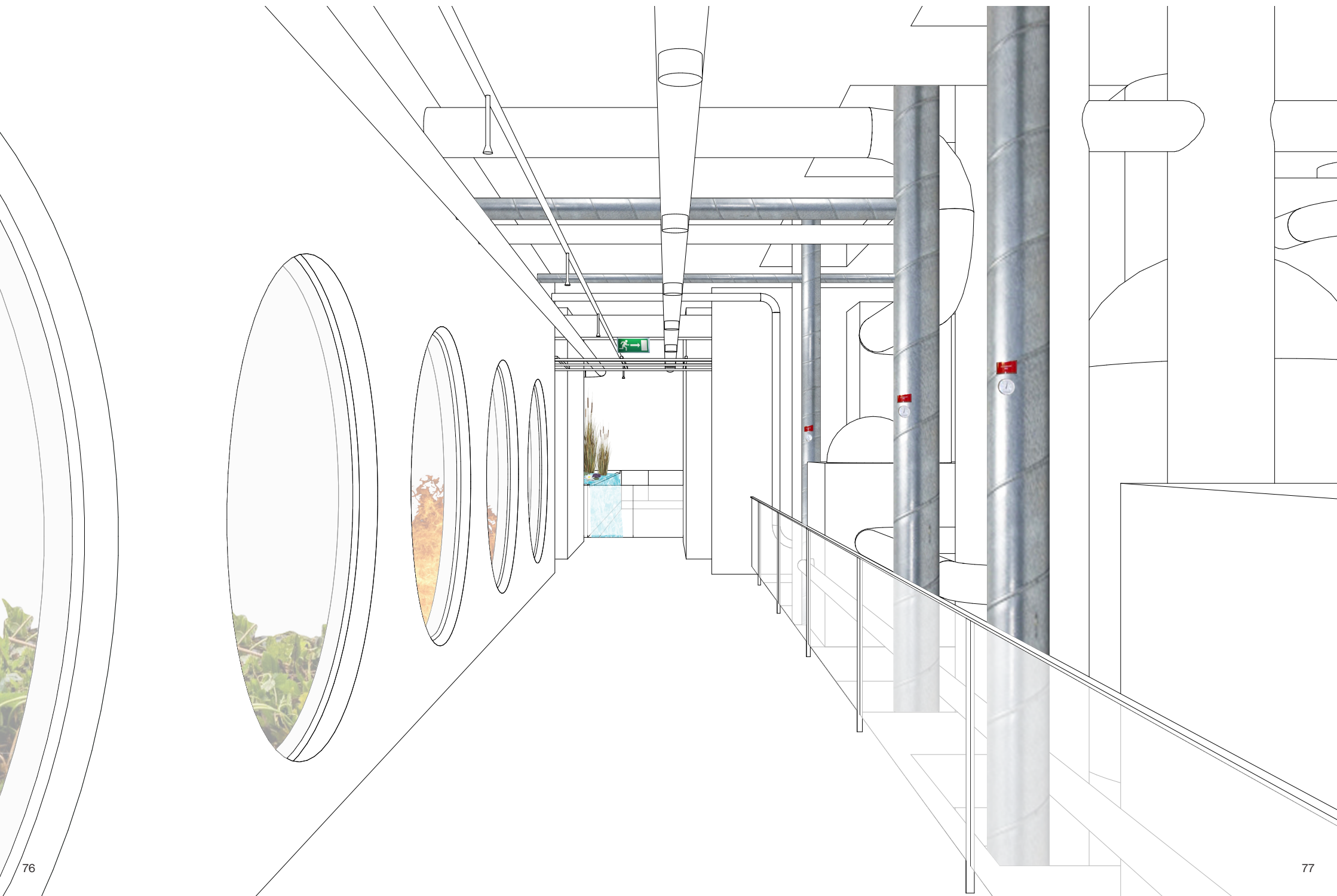
Our protagonist receives non-heated wintergardens along the façade to be able to use solar radiation for passive heat gains. The depth of the conservatories varies according to their orientation.

Its existing horizontal photovoltaic panels on the roof are supplemented by additional vertical panels, which provide more space for plants and animals on the roof.



A vertical photovoltaic panels
B horizontal photovoltaic panels
C wintergardens

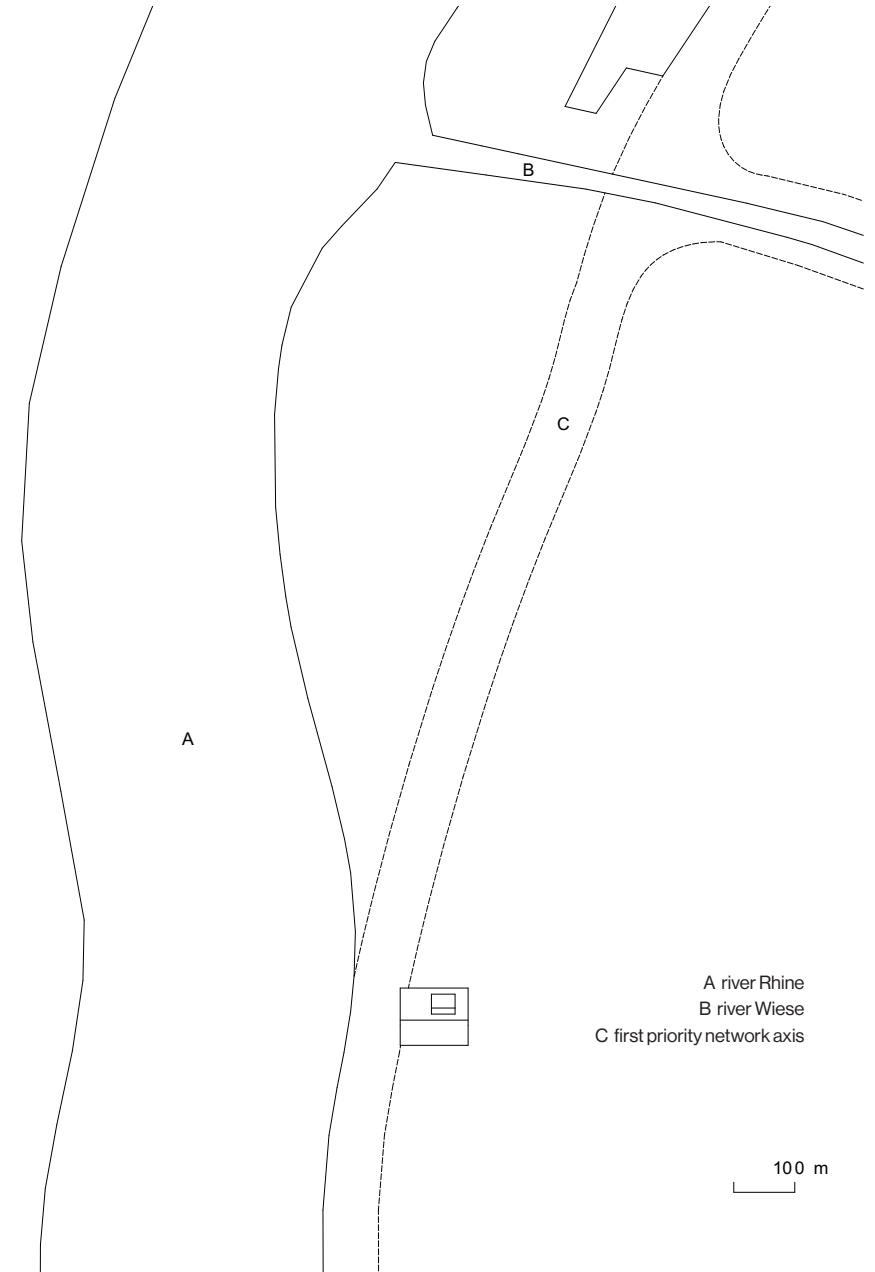
Axonometry solar gains



2 Biotope networks

A biotope network concept was developed for the city of Basel to link the habitats of animals and plants. This concept identifies natural corridors in graded priorities. As a result of road and settlement construction and the more intensive use of open spaces, biotopes are increasingly being fragmented into isolated „islands“. Functioning axes without barriers that support exchange between intact habitats are necessary to promote biodiversity.

Our protagonist lies directly on such an axis for dry warm habitats. In front of the building this area is very narrow and partially sealed. So far it offers little space and protection for flora and fauna.



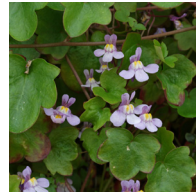
Axonometry natural corridor first priority



Verbascum pulverulentum



Herniaria spp.



Cymbalaria muralis



Plebejus argyrognomon



Podarcis muralis



Calliptamus italicus



Sisymbrium officinale



Arctium spp.



Berteroa incana



Amara sp.



Brosicus cephalotes



Oedipoda caerulea



Chaerophyllum temulum



Corydalis lutea Gelber



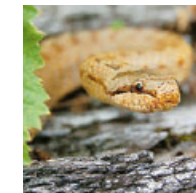
Ballota nigra spp. foetida



Papilio machaon



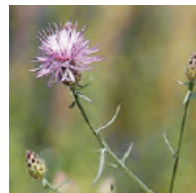
Mantis religiosa



Coronella austriaca



Hordeum murinum



Centaurea stoebe



Galeopsis angustifolia

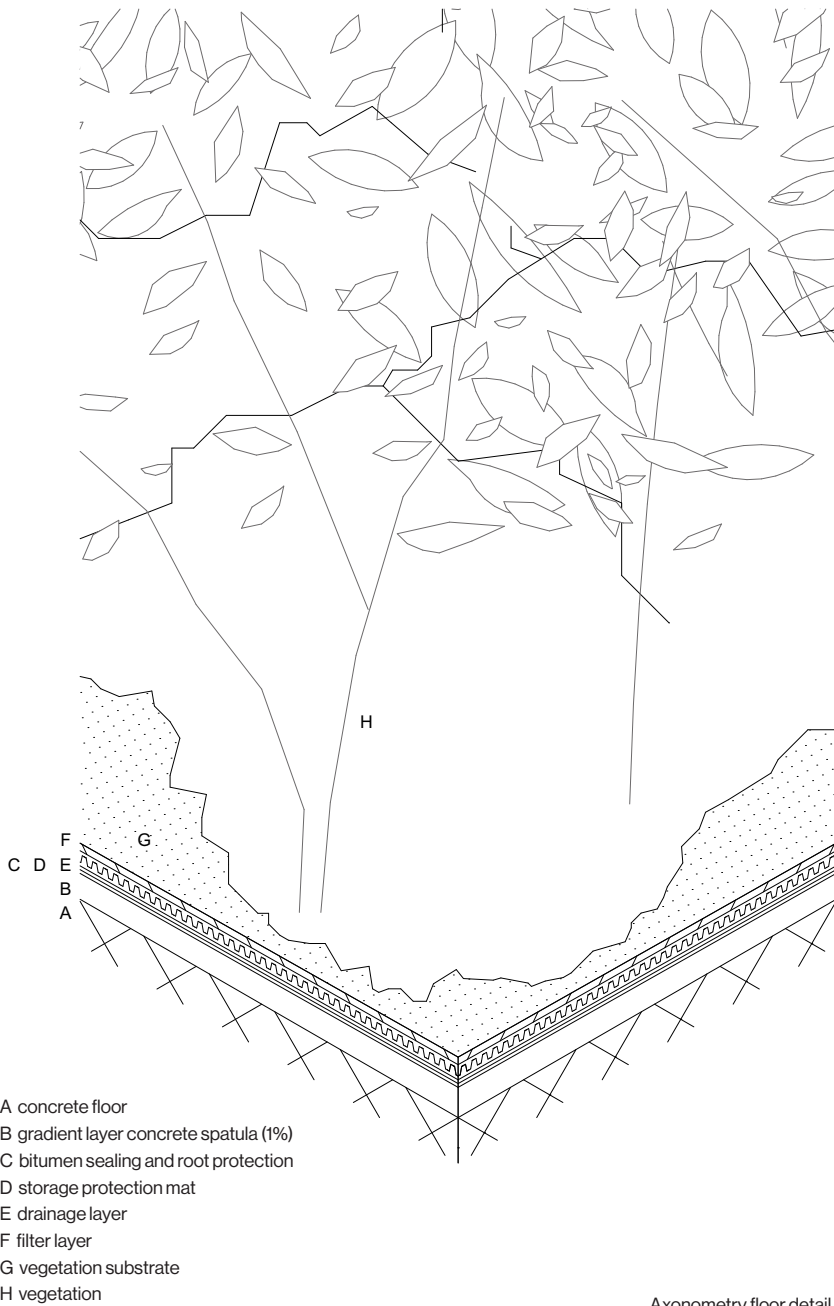


Oecanthus pellucens

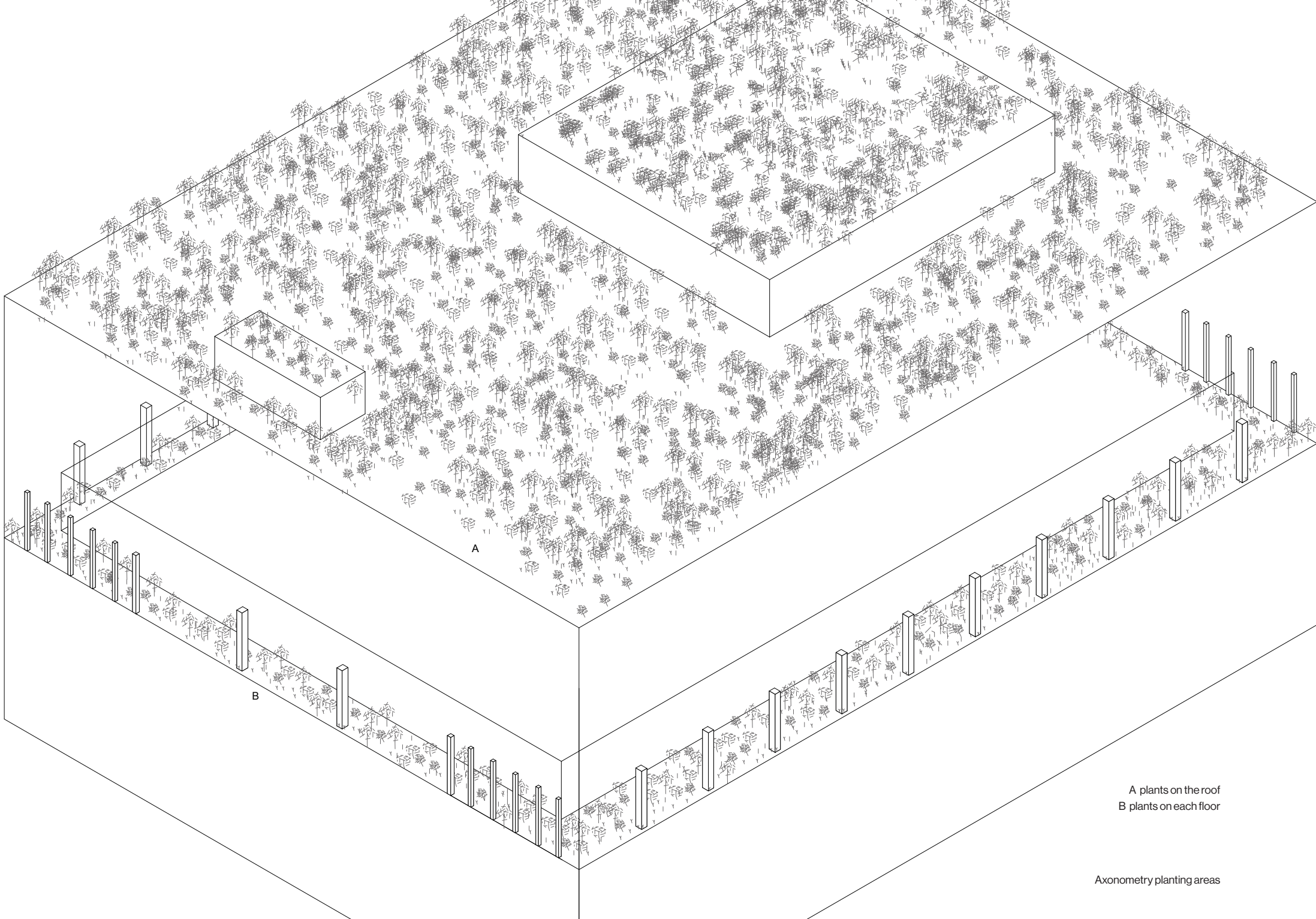
Target species for dry warm habitats

2.1 Plants

In the areas of terraces and wintergardens, the existing floor structure must be removed, as it is not suitable for outdoor use. The resulting difference in height to the living space is replaced with a floor structure similar to a green roof. The thin layer of substrate can be piled up to form hills to allow lush plant growth, or paved with stones in sand to use the area as a terrace. Different layer thicknesses create different habitats, which increases biodiversity. In the conservatories, the areas are watered by the existing fire sprinkler system.



Axonometry floor detail



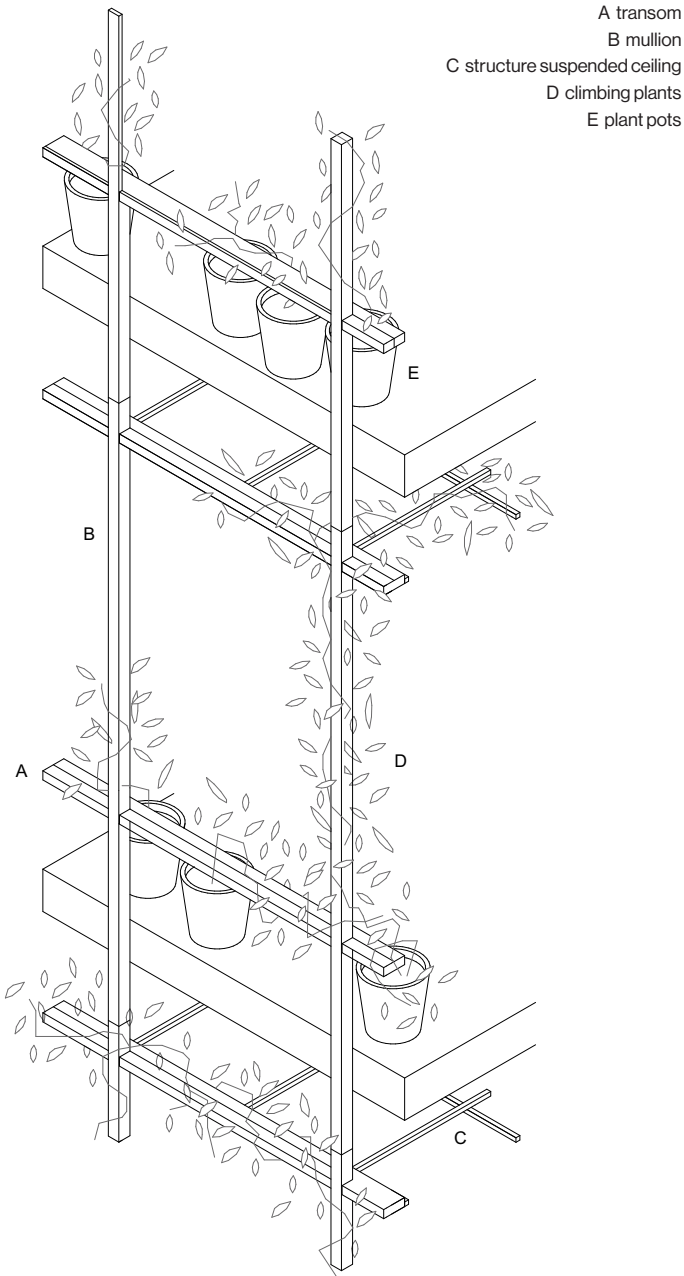
A plants on the roof
B plants on each floor

Axonometry planting areas

2.2 Climbing plants

From the existing façade, only the asbestos-contaminated seals and fillings are disposed of. The mullions and transoms will be retained. They serve as a climbing frame for climbing plants along the façade.

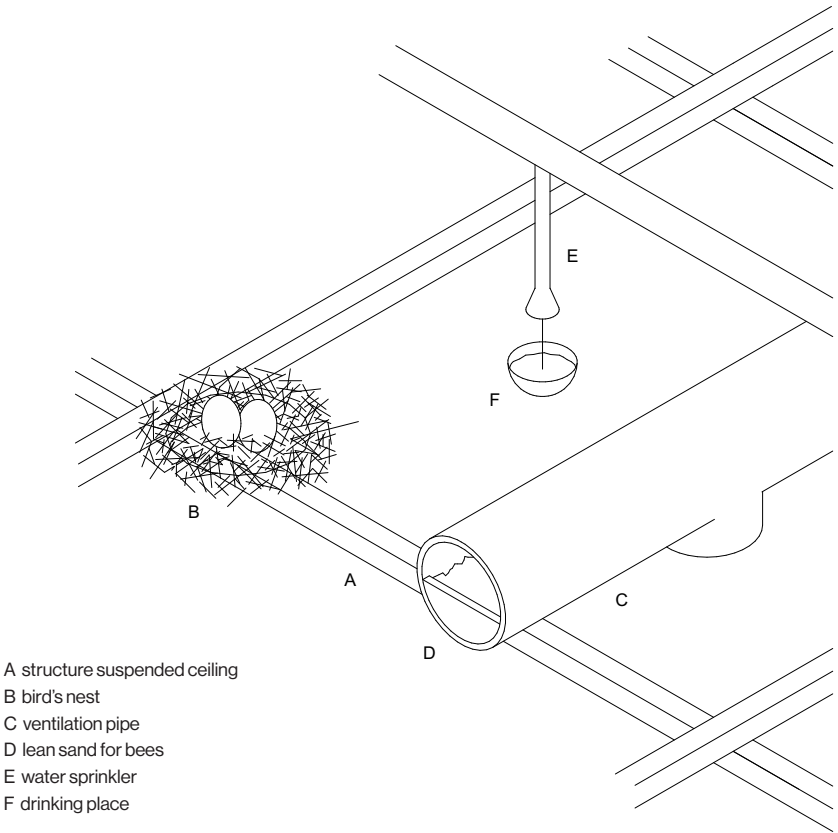
The covering of the suspended ceiling will be removed to benefit from the ceiling height. The supporting structure of the suspended ceiling is retained and serves as a further climbing aid.



Axonometry facade

2.3 Birds and bees

Birds and wild bees do not find nesting or breeding opportunities in the smooth facades of heavily insulated facades. The open structure of the suspended ceiling provides the best conditions for the animals to build nests at a protected height. The no longer needed ventilation pipes of our Protagonist can be used to accommodate wild bees with the help of lean sand.

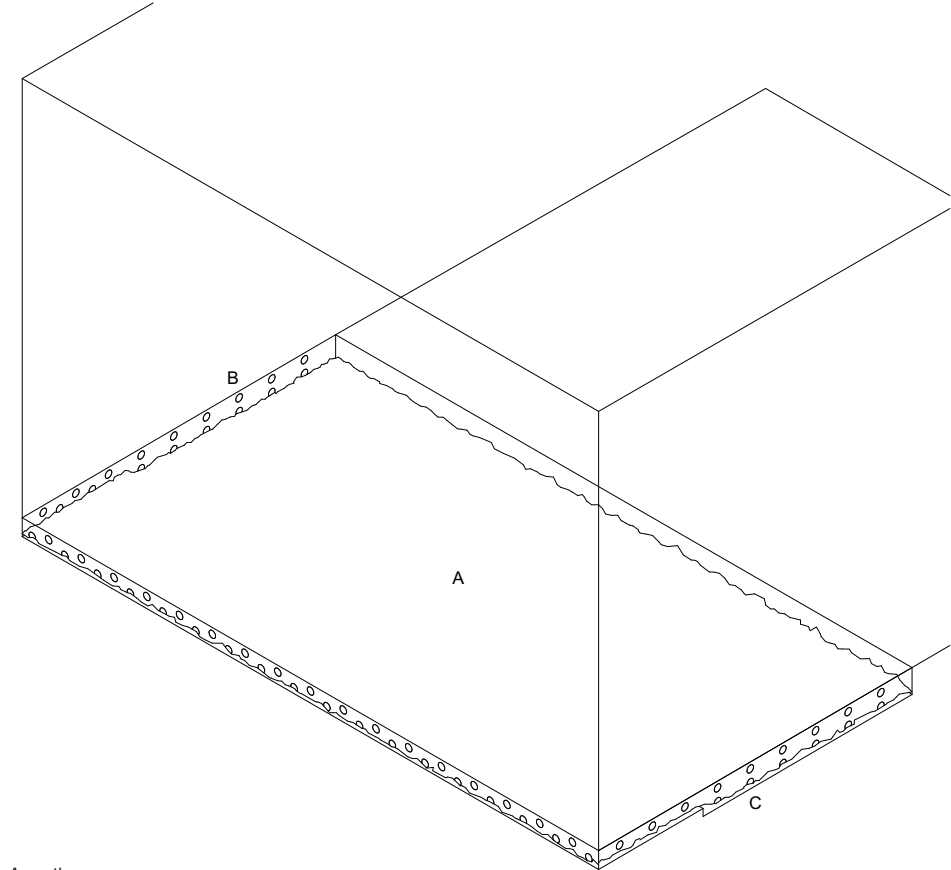


- A structure suspended ceiling
- B bird's nest
- C ventilation pipe
- D lean sand for bees
- E water sprinkler
- F drinking place

Axonometry structure suspended ceiling

2.4 Bats and reptiles

To provide a home for bats and reptiles, the unused mezzanine level of the cellar can be converted. Especially in winter reptiles and bats need frost-free but permanently damp protected rooms. The room is located directly below the water terraces, which provide sufficient humidity, and partially above the ground surface, so that it can be approached through simple openings.

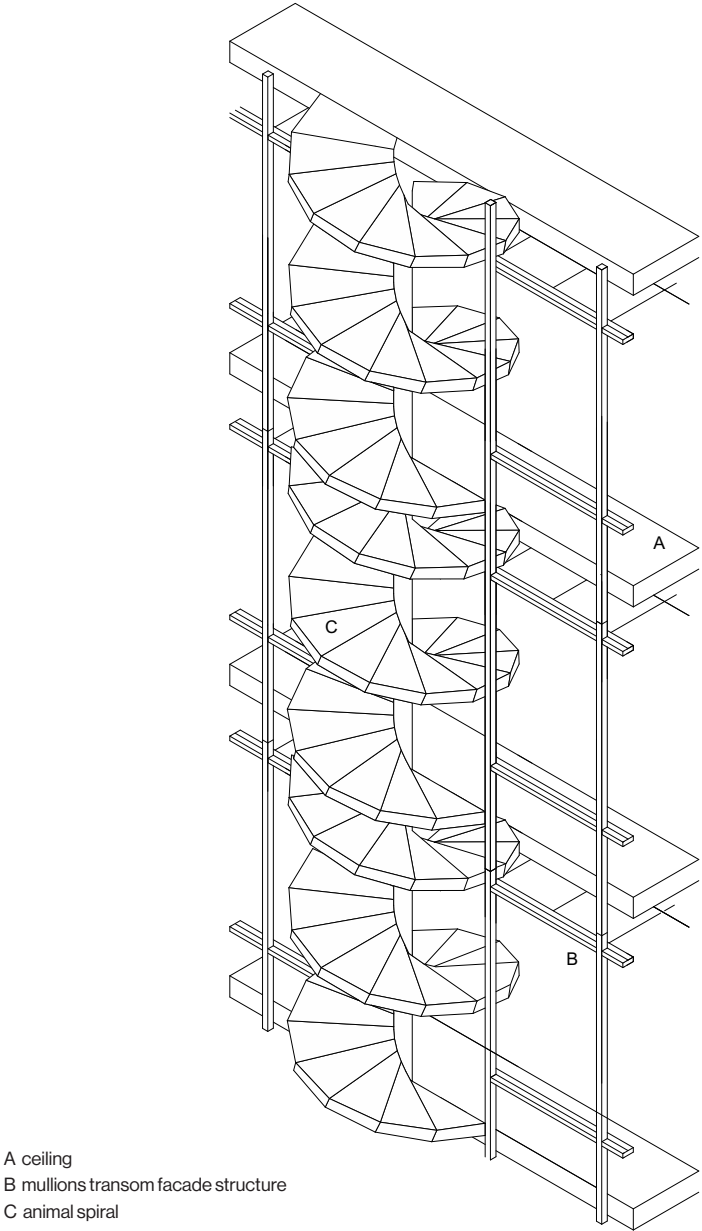


A earth
B openings for bats
C openings for reptiles

Axonometry natural cellar

2.5 Insects and mammals

These residents would love to settle or rest in the green areas along the house and on the roof. In order to reach them, our protagonist receives four spiral green ramps, which serve as access for animals.

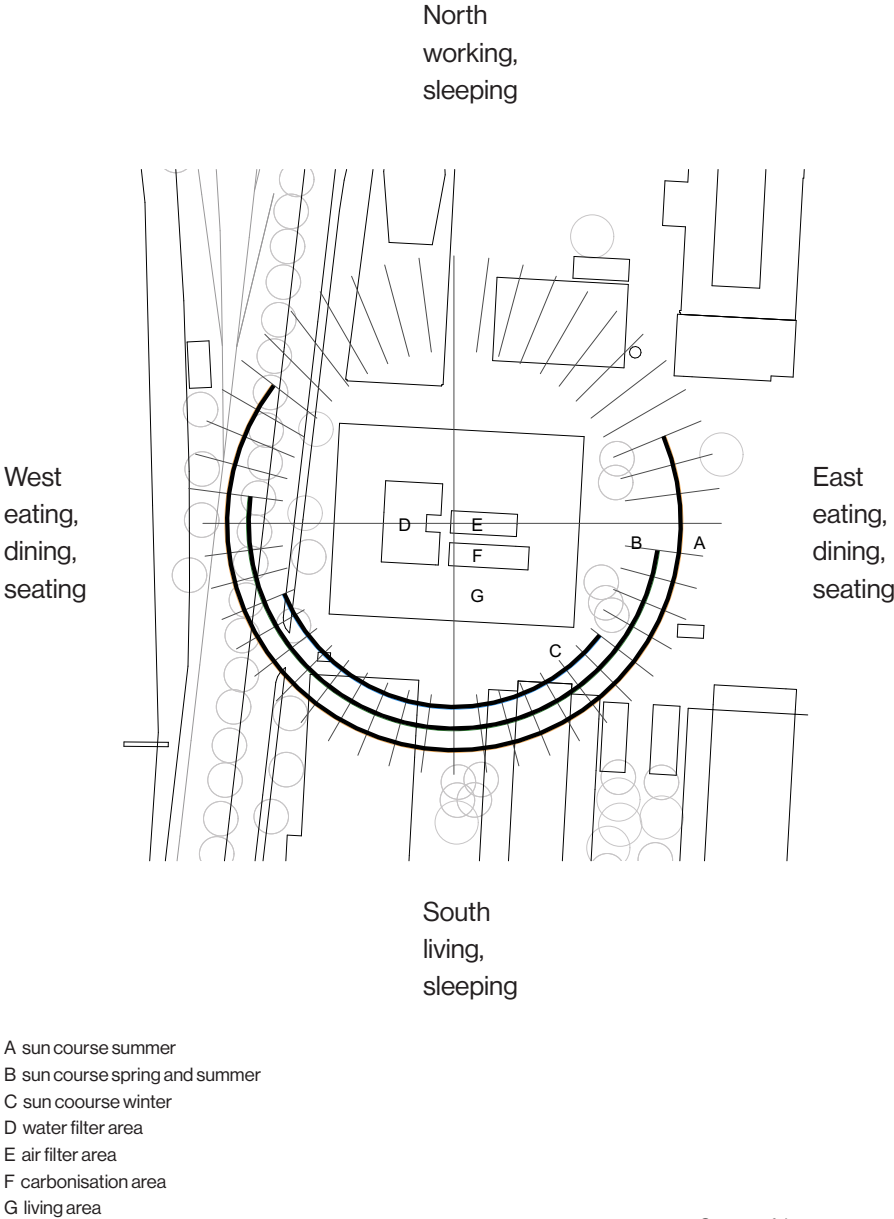


Axonometry animal circulation



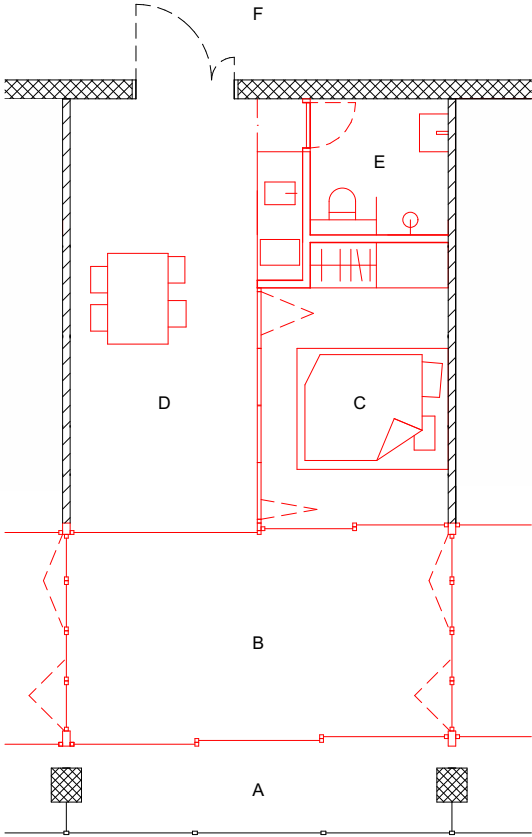
3 Cluster living

Due to the great depth of the building, the rooms in our protagonist, with the exception of the corners of the building, are always oriented on one side only. To be able to benefit from direct sunlight all day long, the human inhabitants live in cluster apartments. Each floor forms a common apartment. On the west and east side are the common rooms, on the north side the bedrooms and work rooms, on the south side the bedrooms and private living rooms. All residents can also benefit from the special view of the Rhine.



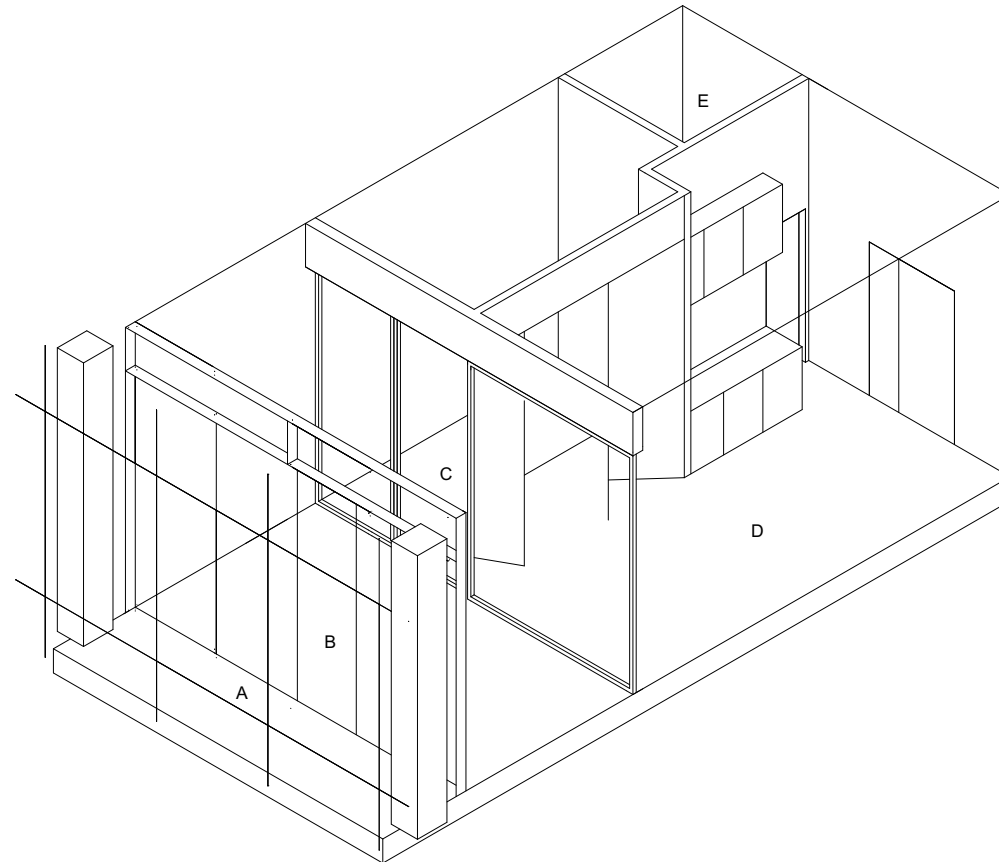
3.1 Singles and couples

There are seven single clusters on each floor. Each cluster apartment is a small apartment of its own to give each resident the privacy they desire. The common rooms function as extra spaces. The clusters consist of 5 climate zones. Only the living area is heated. All clusters can be connected in the wintergardens - for temporary events or to combine several clusters.

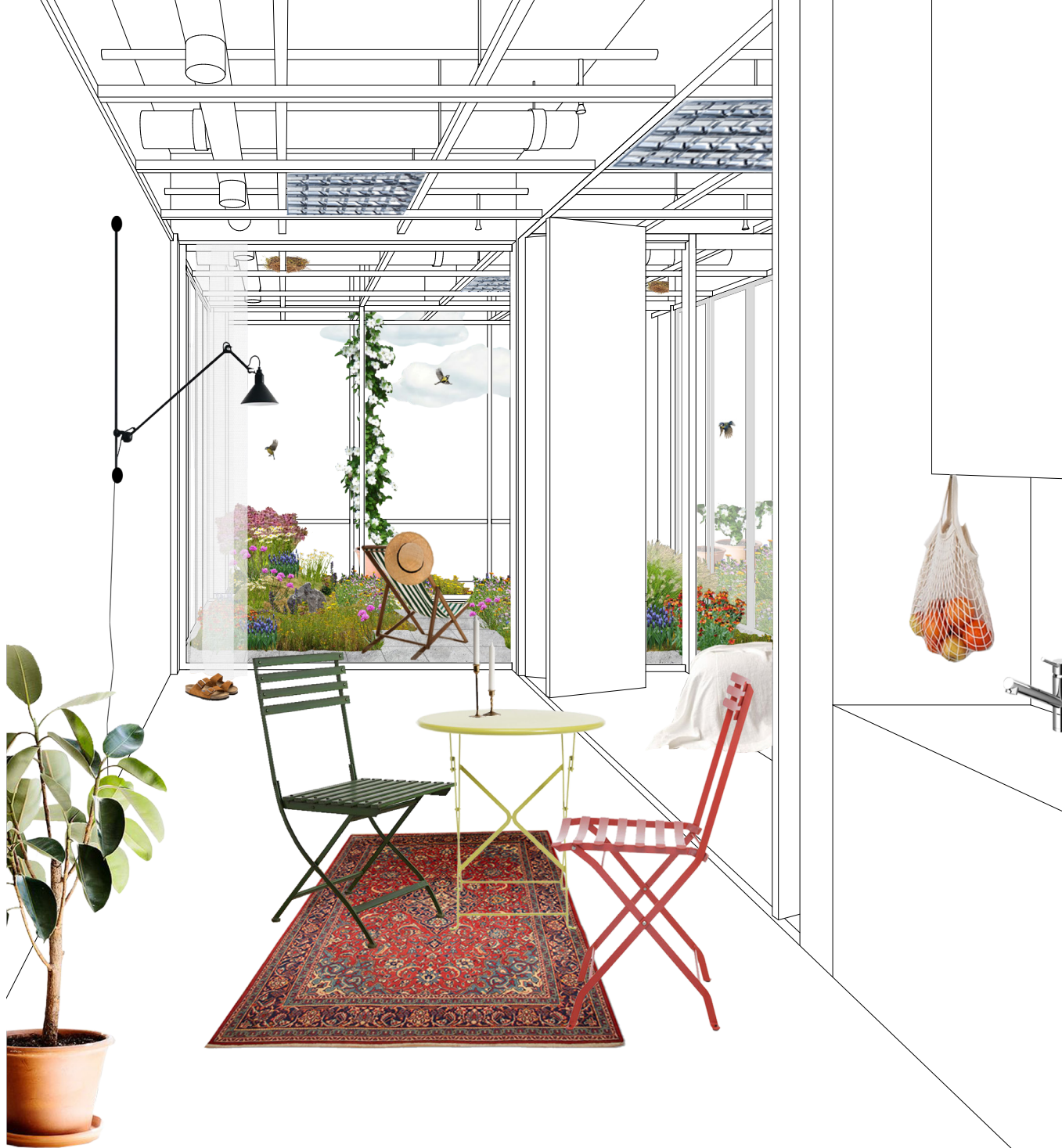


- A outside space, climate zone 1
- B wintergarden, climate zone 2
- C sleeping, climate zone 3
- D living, climate zone 4
- E bath, climate zone 5
- F corridor

Floor plan single cluster



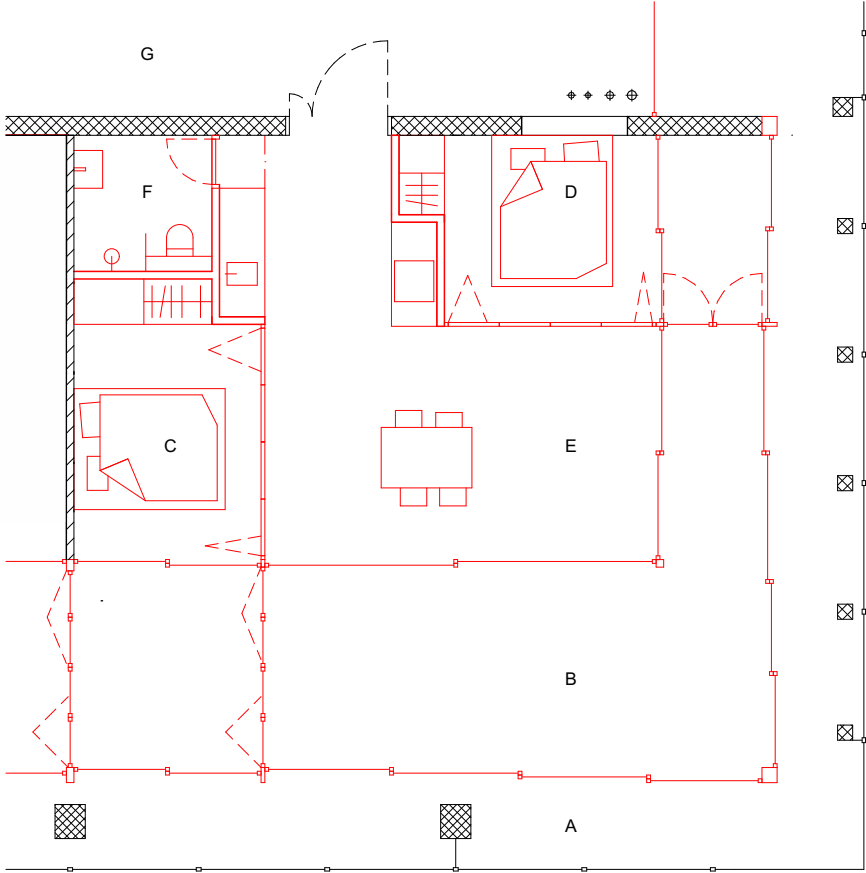
- A outside space, climate zone 1
- B wintergarden, climate zone 2
- C sleeping, climate zone 3
- D living, climate zone 4
- E bath, climate zone 5
- F corridor





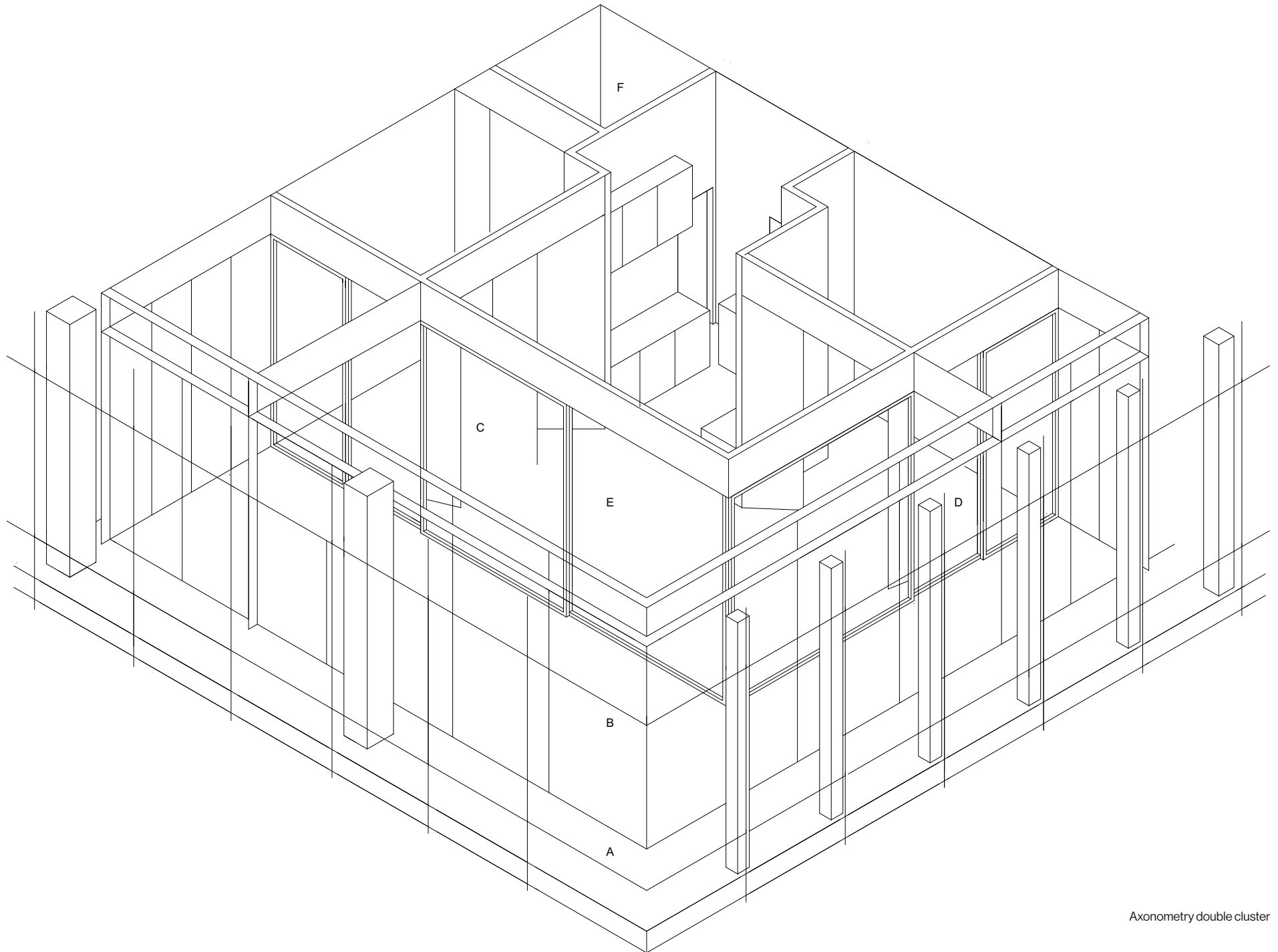
3.2 Families

There are four double clusters on each floor. Just like the single cluster they consist of 5 climate zones



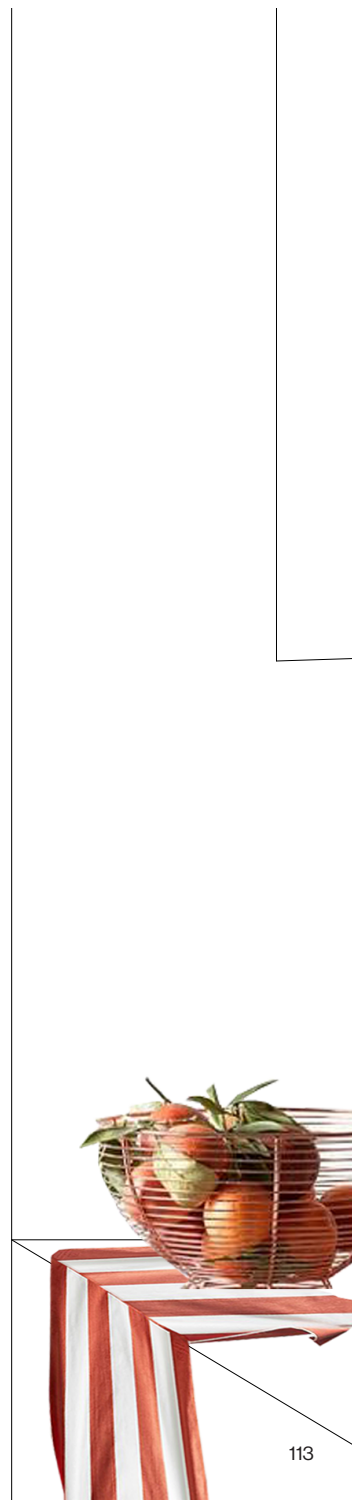
- A outside space, climate zone 1
- B wintergarden, climate zone 2
- C sleeping, climate zone 3
- D sleeping, climate zone 3
- E living, climate zone 4
- F bath, climate zone 5
- G corridor

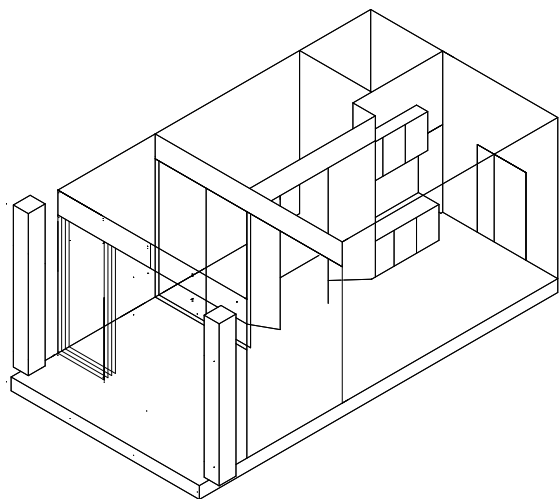
Floor plan double cluster



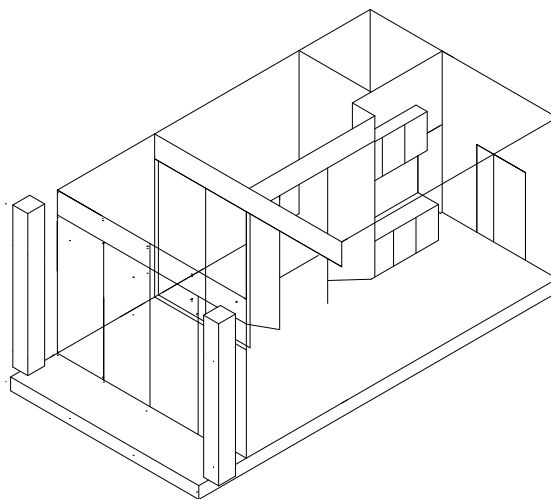
Axonometry double cluster



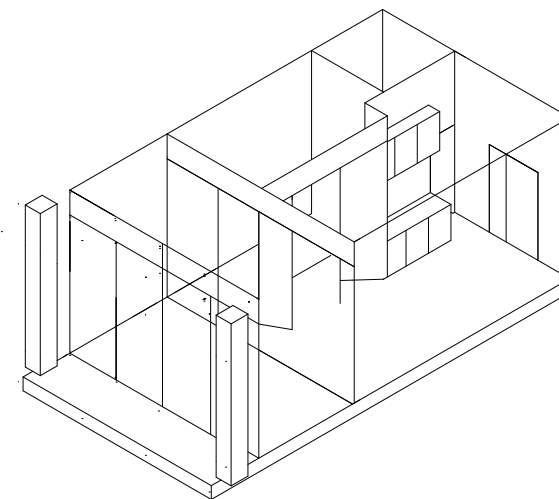




Summer
facade wintergarden: open
facade living space: open
living space: 49 m²



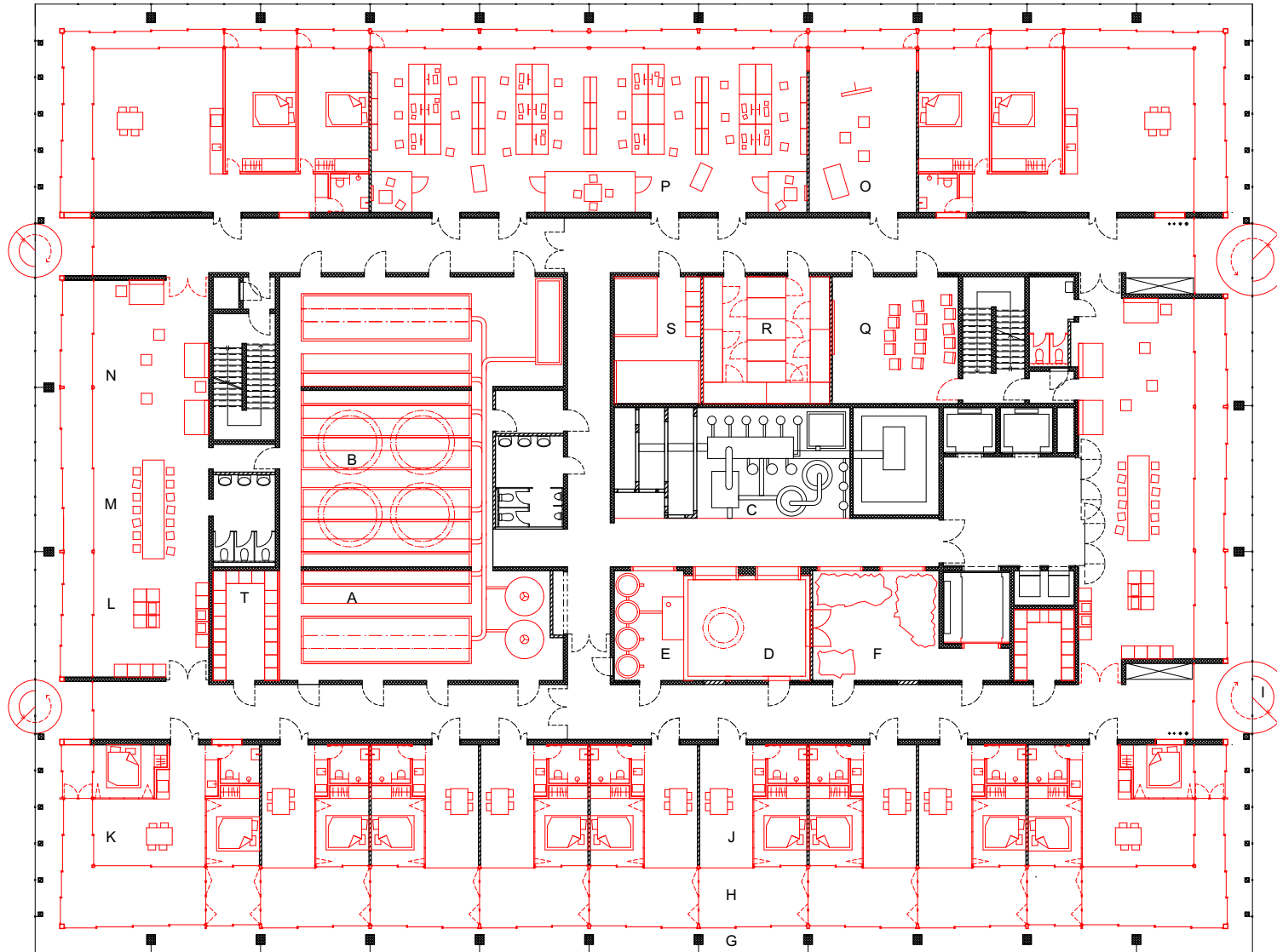
Spring, Autumn
facade wintergarden: closed
facade living space: open
living space: 42 m²



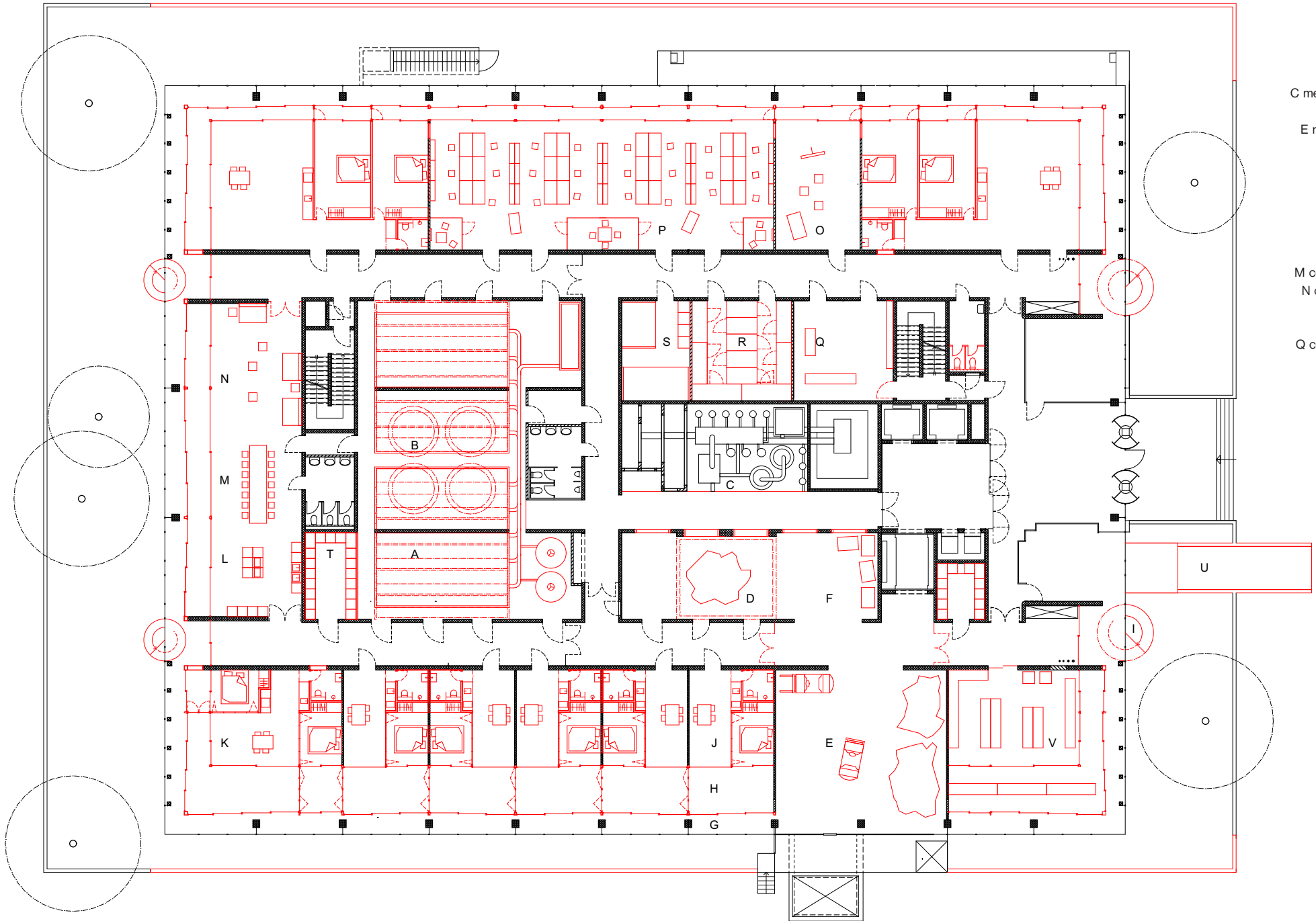
Winter
facade wintergarden: closed
facade living space: closed
living space: 29 m²

C

How we will live together

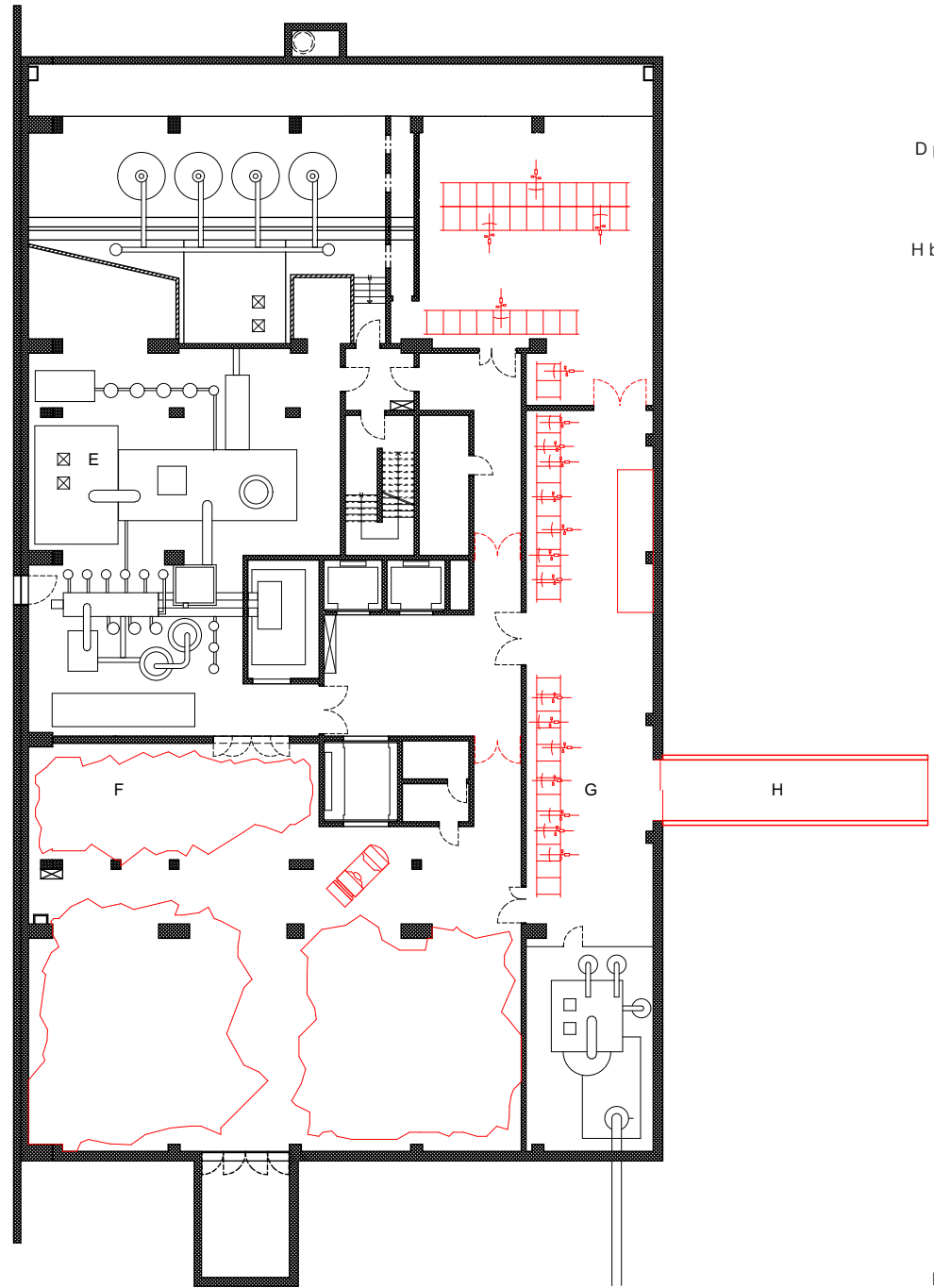
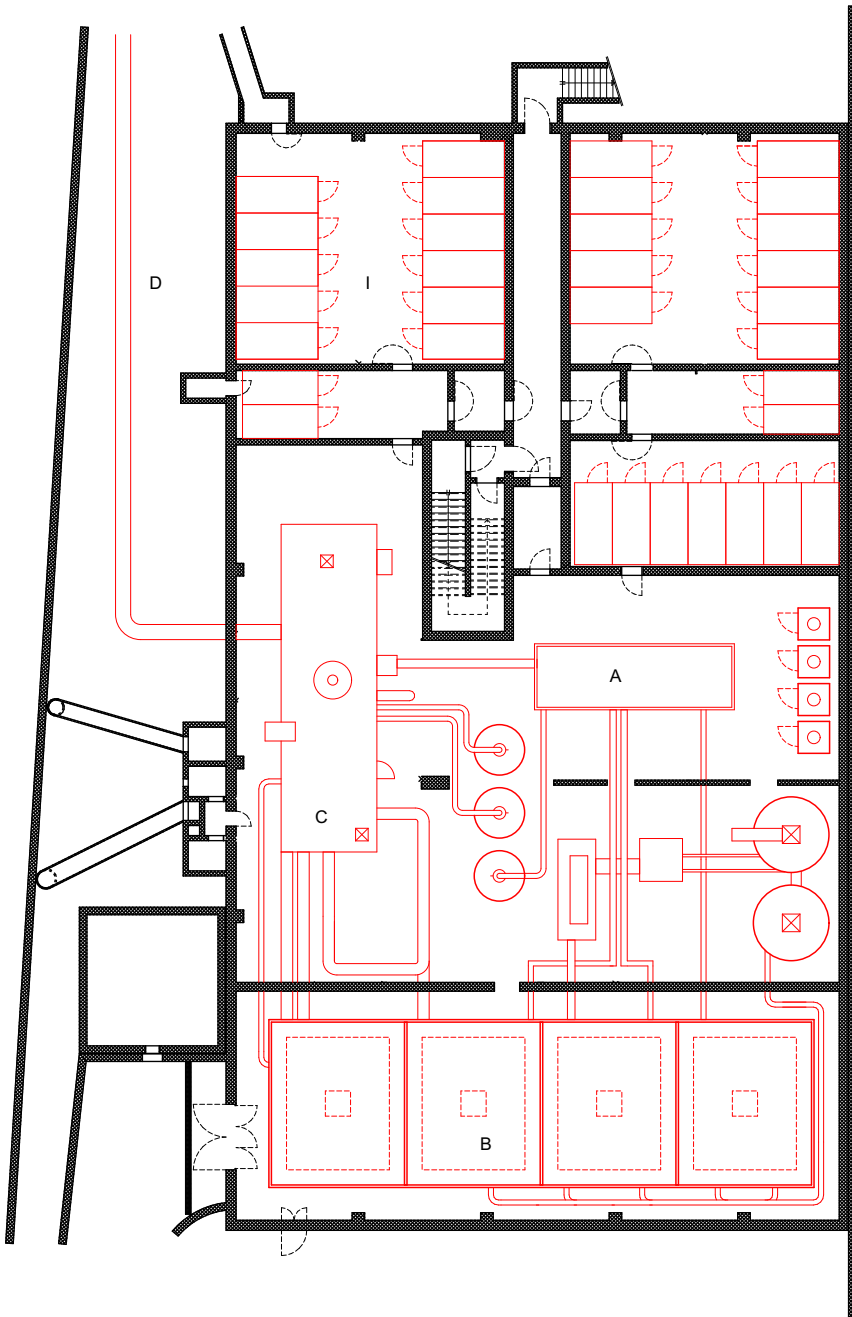


- A water filter
- B wind catcher
- C mechanical ventilation
- D carbonisation chamber
- E excrements storage
- F green waster storage
- G outside space
- H wintergarden
- I animal spiral
- J single cluster
- K double cluster
- L common kitchen
- M common dining room
- N common living room
- O studio
- P working spaces
- Q common extra space
- R storage
- S laundry
- T kitchen storage



- A water filter
- B wind towers
- C mechanical ventilation
- D output soil
- E removal and delivery
- F packaging soil
- G outside space
- H wintergarden
- I animal spiral
- J single cluster
- K double cluster
- L common kitchen
- M common dining room
- N common living room
- O studio
- P working spaces
- Q common extra space
- R storage
- S laundry
- T kitchen storage

Ground floor plan

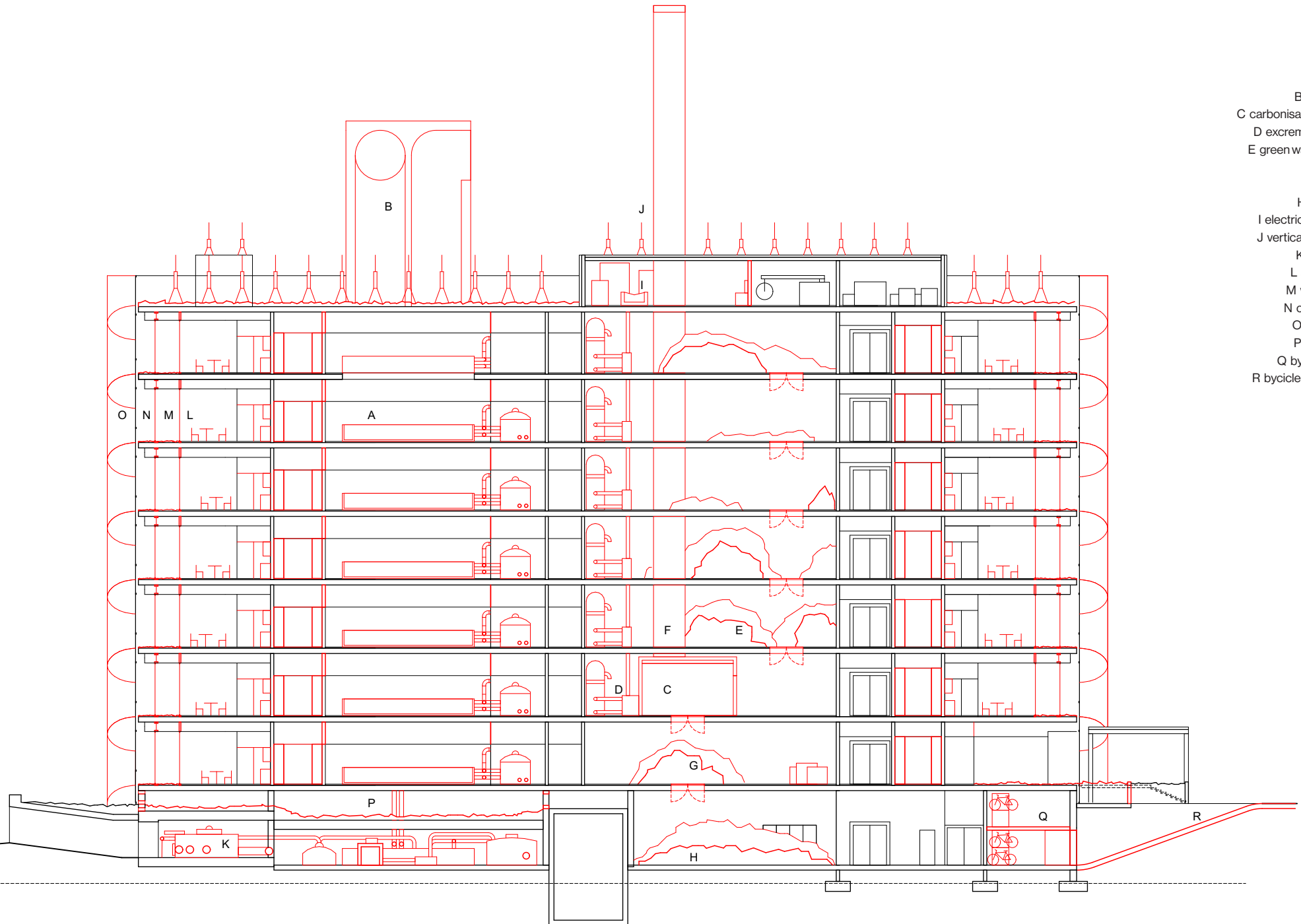


- A collection basin
- B overflow basins
- C water pump
- D pipe to watering site
- E air filter
- F soil storage
- G bicycle storage
- H bicycle access ramp
- I storage

Basement floor plan

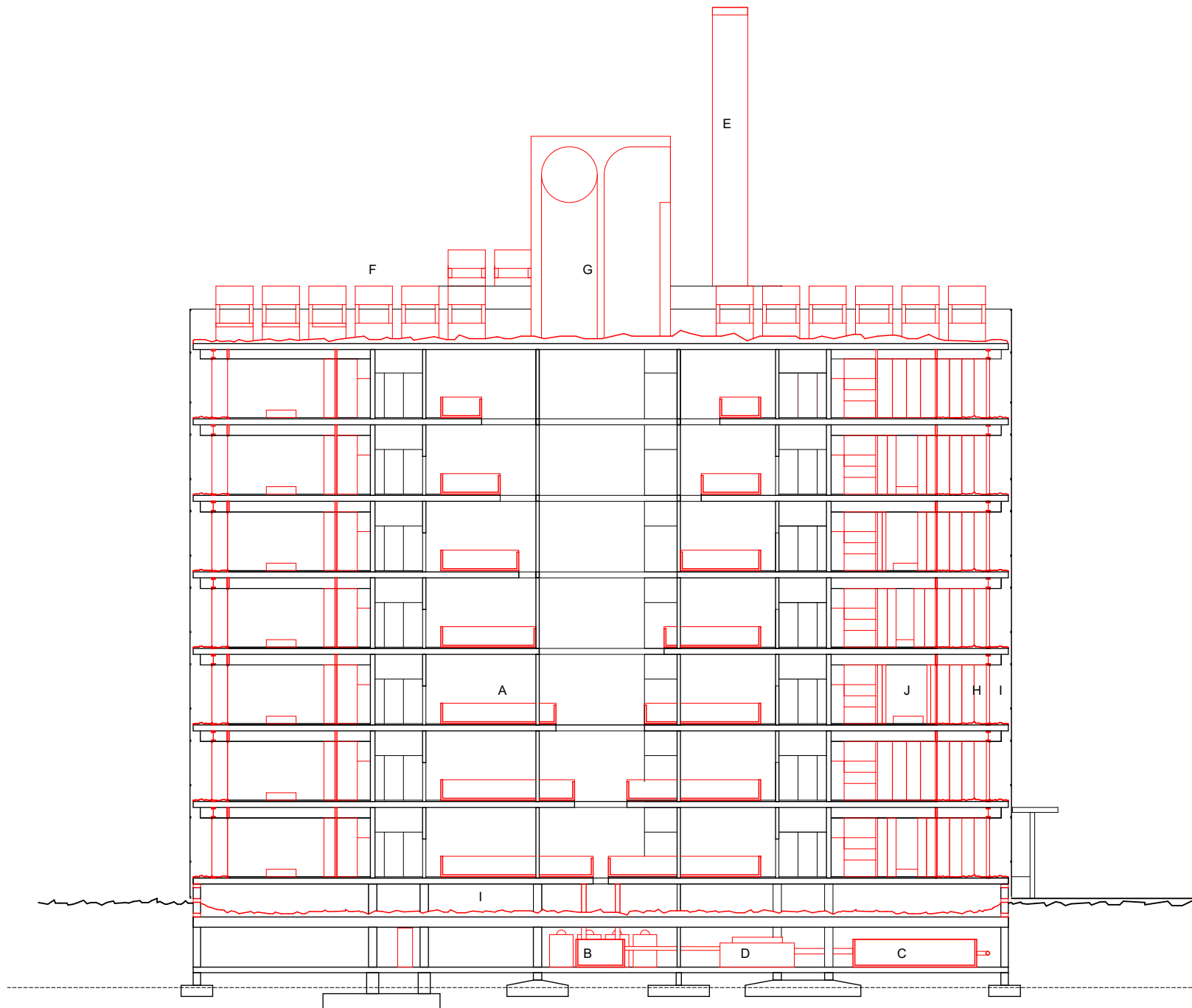


- roof floor plan

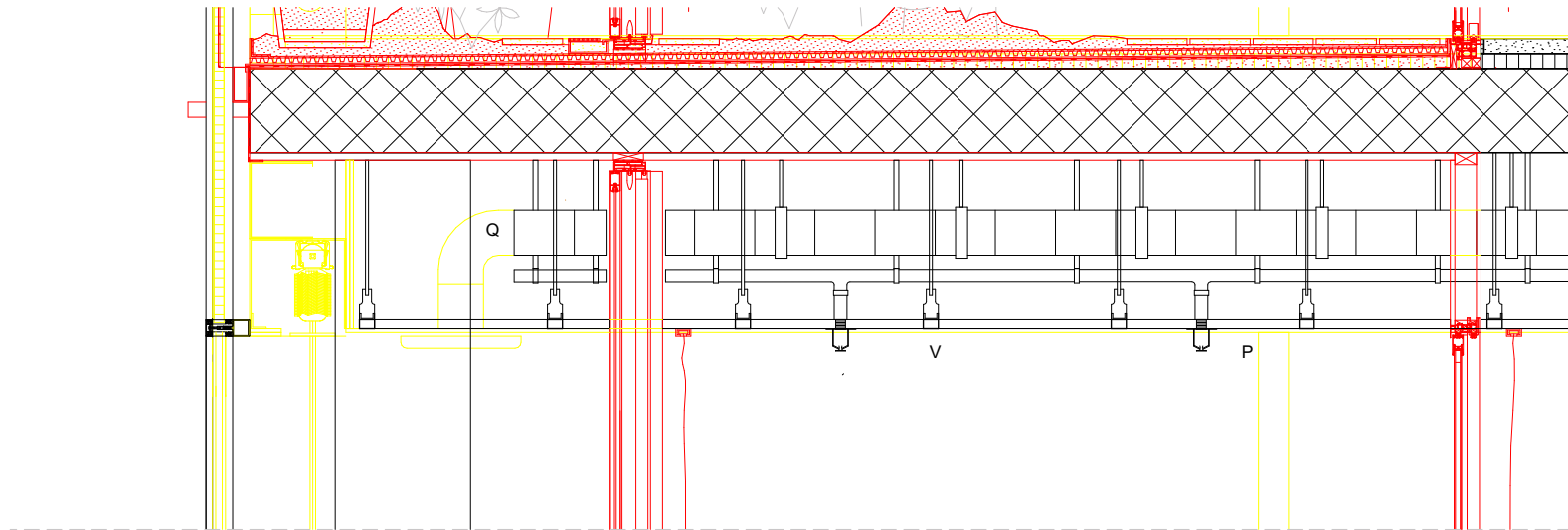


- A water filter
- B wind towers
- C carbonisation chamber
- D excrements storage
- E green waster storage
- F chimney
- G output soil
- H soil storage
- I electricity generator
- J vertical solar panels
- K water pump
- L single cluster
- M wintergarden
- N outside space
- O animal spiral
- P animal cellar
- Q bicycle storage
- R bicycle access ramp

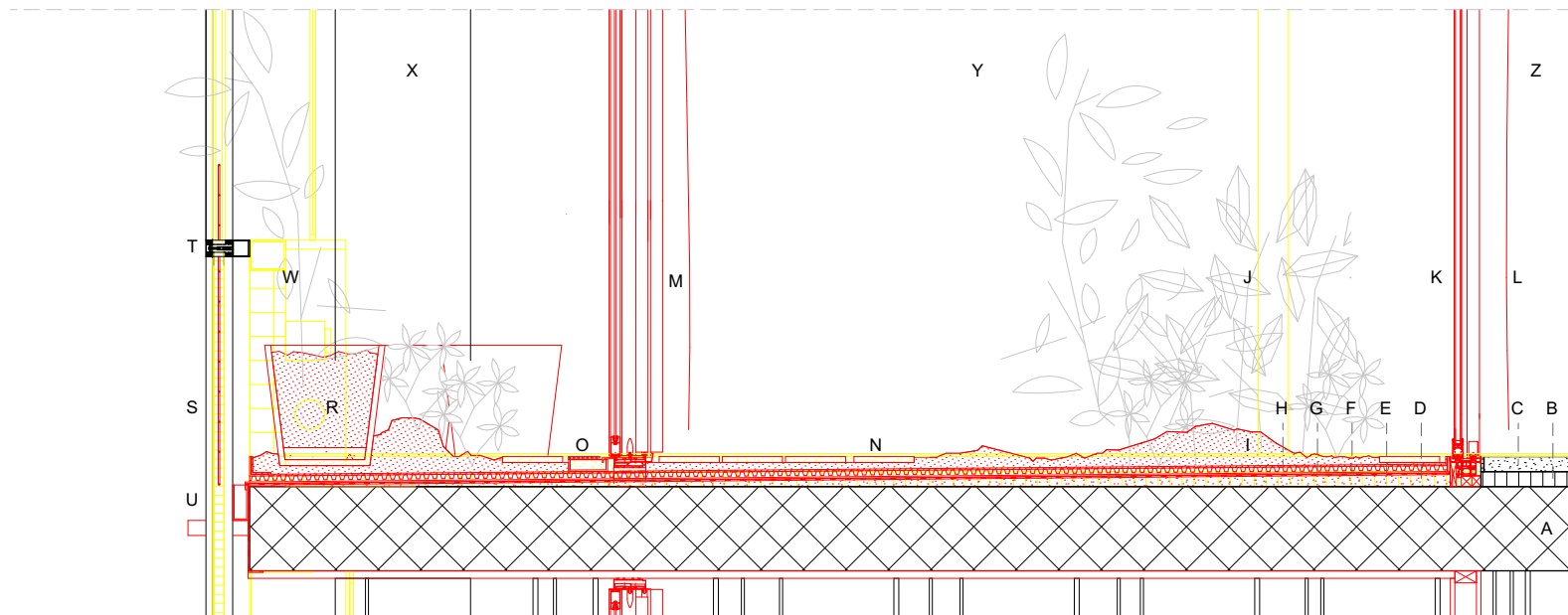
Section A



- A water filter
- B collection basin
- C overflow basins
- D water pump
- E chimney
- F vertical solar panels
- G wind towers
- H wintergarden
- I outside space
- J single cluster



- A concrete floor
- B footfall sound insulation
- C cement screed
- D gradient layer concrete spatula (1%)
- E bitumen sealing and root protection
- F storage protection mat
- G drainage layer
- H filter layer
- I vegetation substrate
- J vegetation
- K double glazed sliding door
- L thermal curtain
- M single glazed sliding door
- N concrete plates
- O rain gutter
- P water sprinkler for vegetation watering
- Q open tubes for birds nests
- R plant pots for climbing plants
- S railing
- T facade profiles for climbing plants
- U water spout
- V suspended ceiling profiles
- W climbing plants
- X outside space
- Y wintergarden
- Z cluster living space



The project will provide affordable housing for all inhabitants,
if we succeed in integrating the ecological costs into our economic system.