



ANAISE VALLÉE

MASTERARBEIT
THEMA C: RE-USE CIBA

FRÜHLING 2020

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ETH ZÜRICH

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MASTERARBEIT FS20

THEMA C
«RE-USE CIBA»

FROM THE EARTH TO THE SKY

URBAN PLANNING

The site of the building is situated in the north of Basel in the ex-campus Novartis. The strategy is to develop a new 24 hours area. Based on this synthesis plan already made, we propose to create a green line which crosses the whole area till the river. The pedestrian areas are going to be multiplied to create a large pedestrian zone in the area. Next to the river there will be a carefree promenade that will be linked with stairs and ramps to the 24 hours zone.

The four interventions of the students will produce different types of energy. Depends of the energy demand of each buildings, the energy can be shared between them. For example, a habitation building will need more energy during the morning and evening, when people are home. The energy produce from this building during the day will not 100% be used and can be shared with another building (for example office building) that needs it during the day.

RE-USE

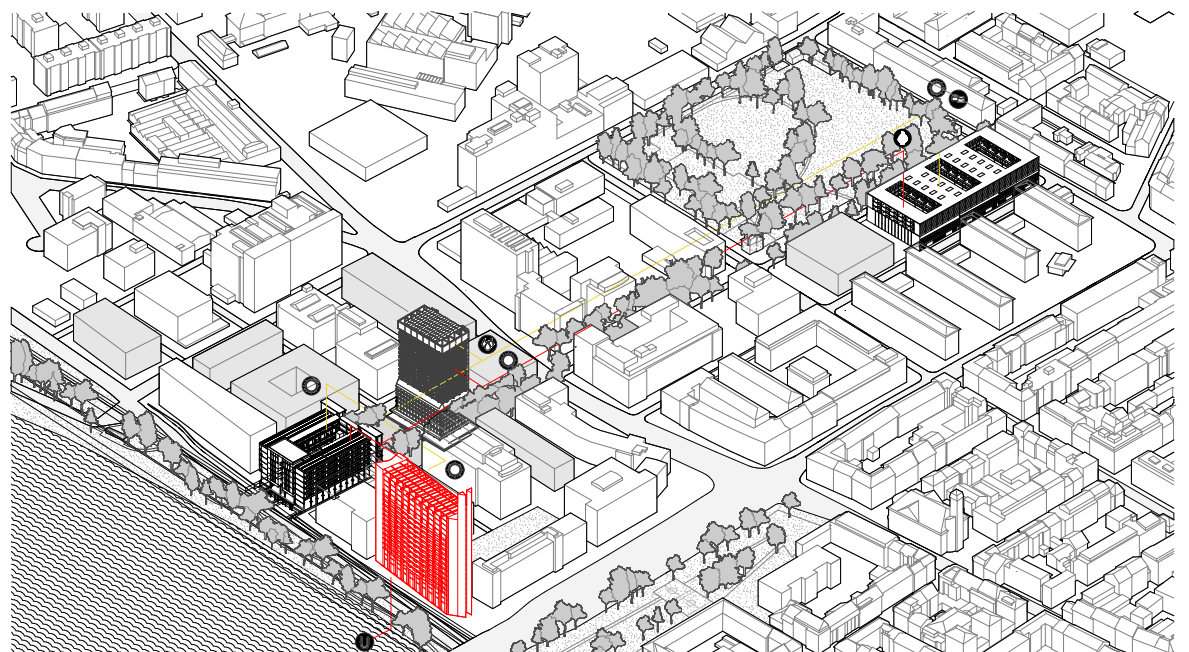
The existing building is an old Biology laboratory. It is mad of a concrete structure and a glass facade. I will keep the existing structure (concrete slabs and concrete columns) and take away the old glass facade. The new facade will be a hybrid rammed earth/concrete facade. On the north and south side, they are two verticals concrete elements used for the building system and the circulation.

The east and west facades are made of rammed earth. It is important to say that rammed earth is a very renewable material. It is an example for the future renewable constructions because of its sustainability and its simplicity. The material is also really good to regulate the humidity into the space.

The passive heating and cooling system of the building are made of two high solar chimneys. They are also a main characteristic of the building, not only for its the functionality but also because the industrial character of the two-glass chimney reminds the past history of the old industrial area.

STRUCTURE

The main existing structure of the building is made of concrete (slab and columns). The intervention consists in taking away the glass facades (east a d west) and replace them with a hybrid rammed earth/concrete facade. The new concrete structure is made of beams and columns that support the rammed earth walls.



PROGRAM AND ORGANISATION

The new building has a mixed-used program, that is going to be active during the day and the night. The architectural expressing of the east and west facades underlines the three different uses of the building. The lower part, three floors, is essentially public, with shops, restaurants and ateliers. The middle part, twelve floors, is made of two floors habitations. It is the only part with balcony that gives a movement to the facade. The highest part, three floors, are an hotel with a lobby and 80 rooms. On the Top there is also a public roof terrace.

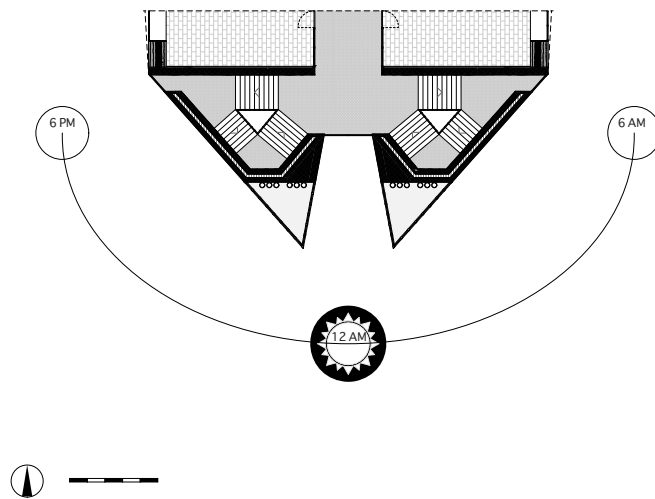
The circulation works very similar for each floor. The horizontal circulation is made of a central corridor that links the south and north wings where two vertical structure satisfied the vertical circulation.

BUILDING SYSTEM

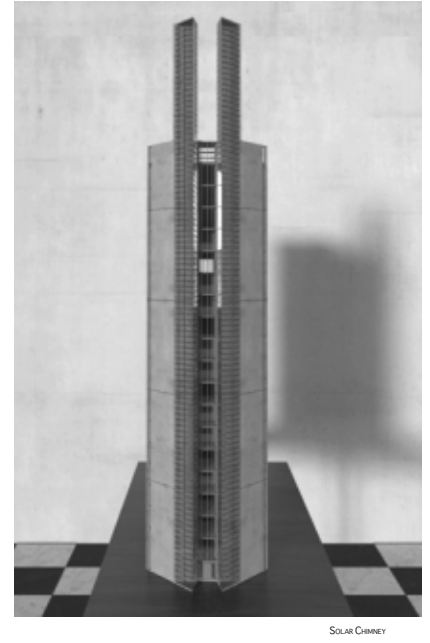
Because of the building height, its position and the surrounding constructions, the building is very little shaded. In front of the south facade there are very low elements (a road and a parc) and a maximum of sun can heat up the south wall. I decided to use this facade to introduce two very high solar chimneys made of glass and metal. They will be use as a passive system to heat and cool the building.

In summer when the sun is shining and the temperature are high, there is a need for a ventilation system inside the building. There is a hybrid passive and mechanical system. The passive system works with the sun and the solar chimney. Thanks to the sun, the air in the solar chimney will be heated up. The warm air will rise and go out trough openings on the top of the chimneys. This will create a stack effect that will suck the outside fresh air through the windows into the building. The central corridors help for this. For the kitchen and the bathrooms, there is a mechanical system that brings the air directly on the roof where it can be evacuated.

In winter when the temperature is lower, there is a need to warm up the building. Water from the Rhein will be pumped and brought through pipes into the solar chimney where it will be warmed up by the sun. The hot water will be conduct in each floor as a floor heating system. As back-up system, there is a geothermal pump. All the water tanks are stored in the basement of the building. For the domestic water there is another water tank which is independent from the other.

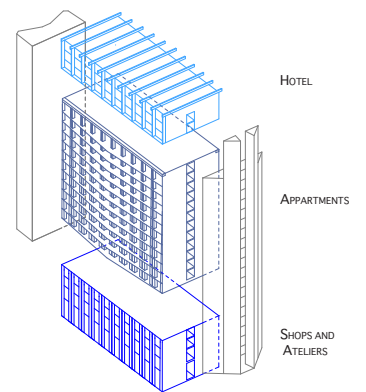
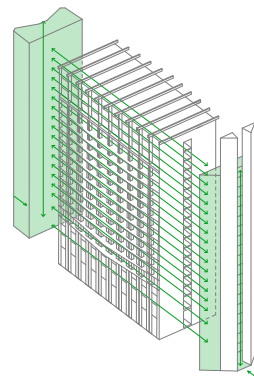
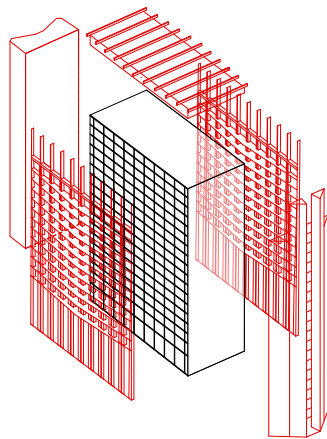


Existing and Intervention

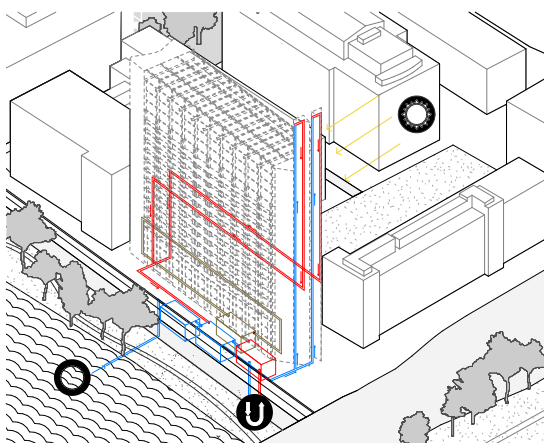


Circulation

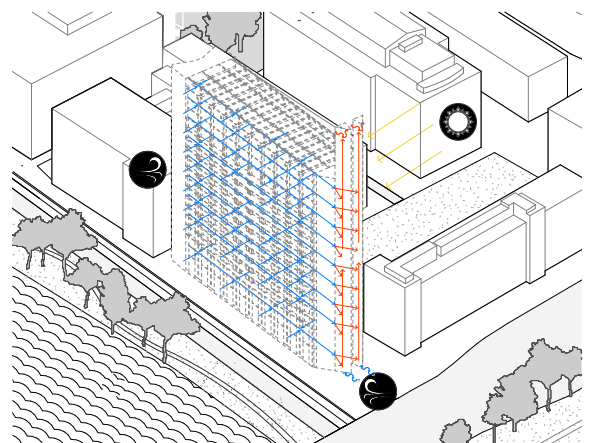
Mixed-Use



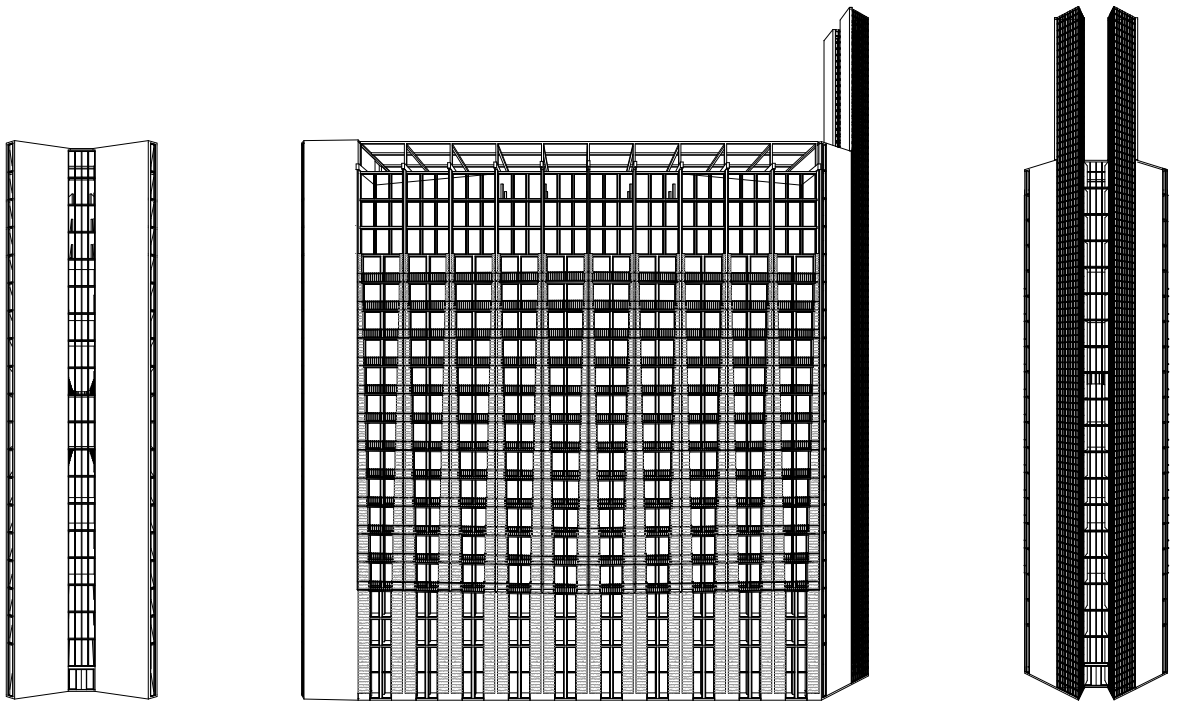
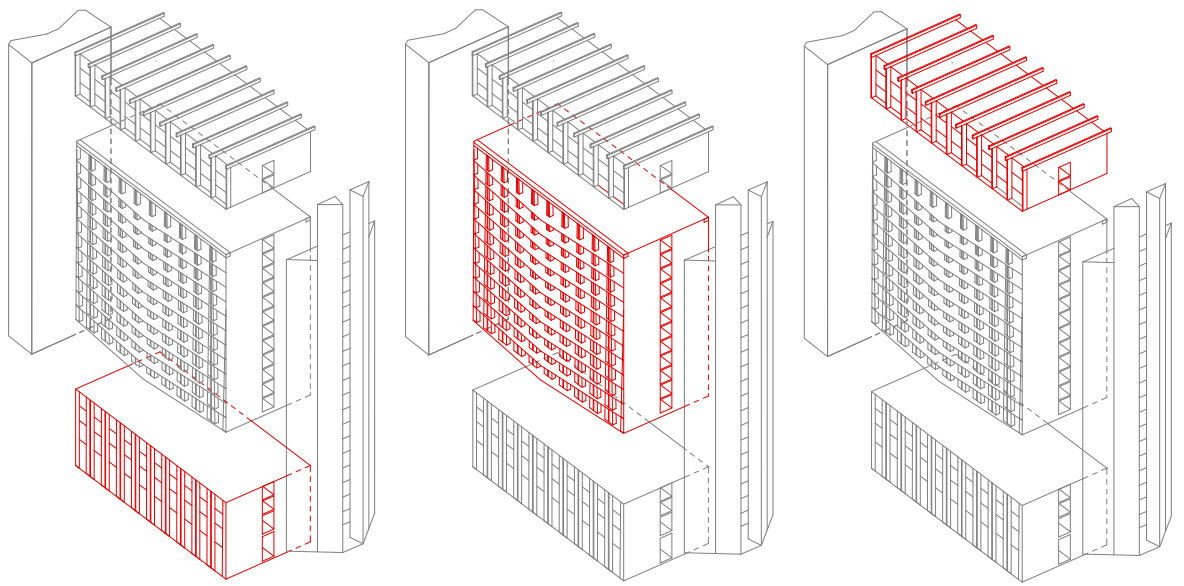
Building System Concept

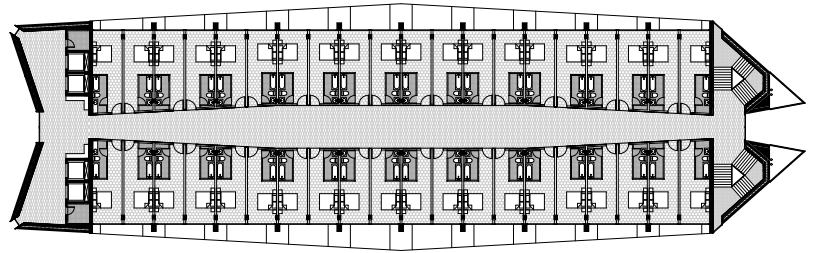
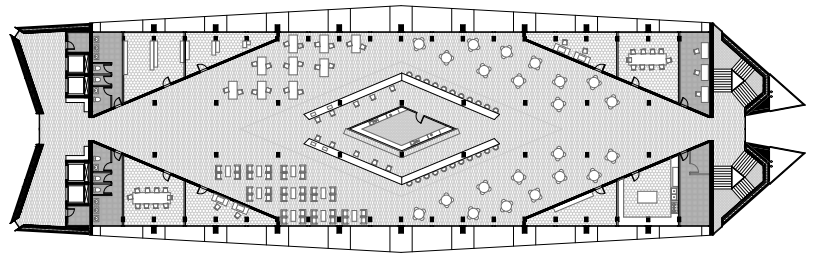


Heating System

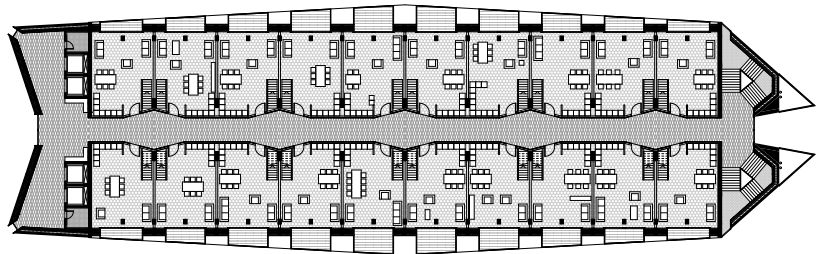
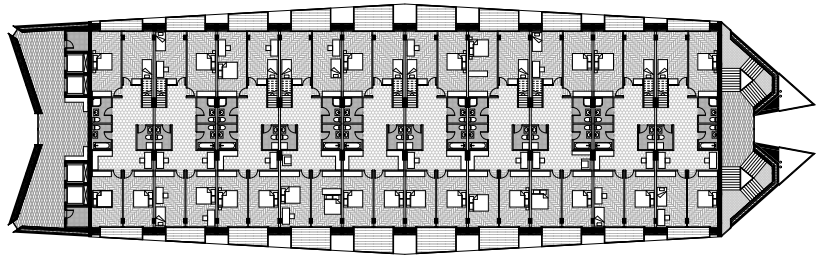


Ventilation System

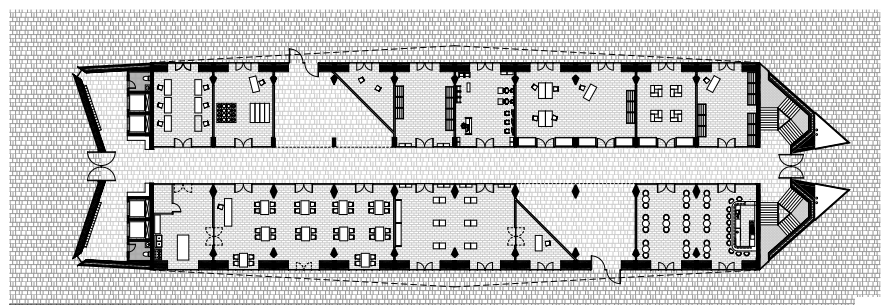
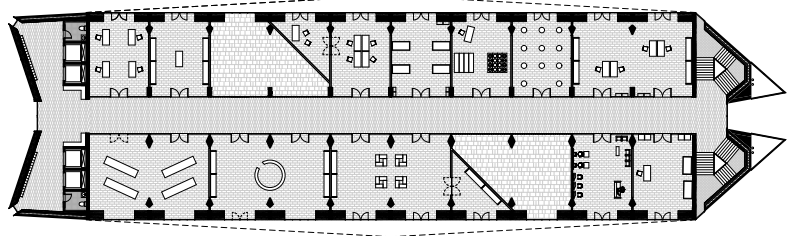




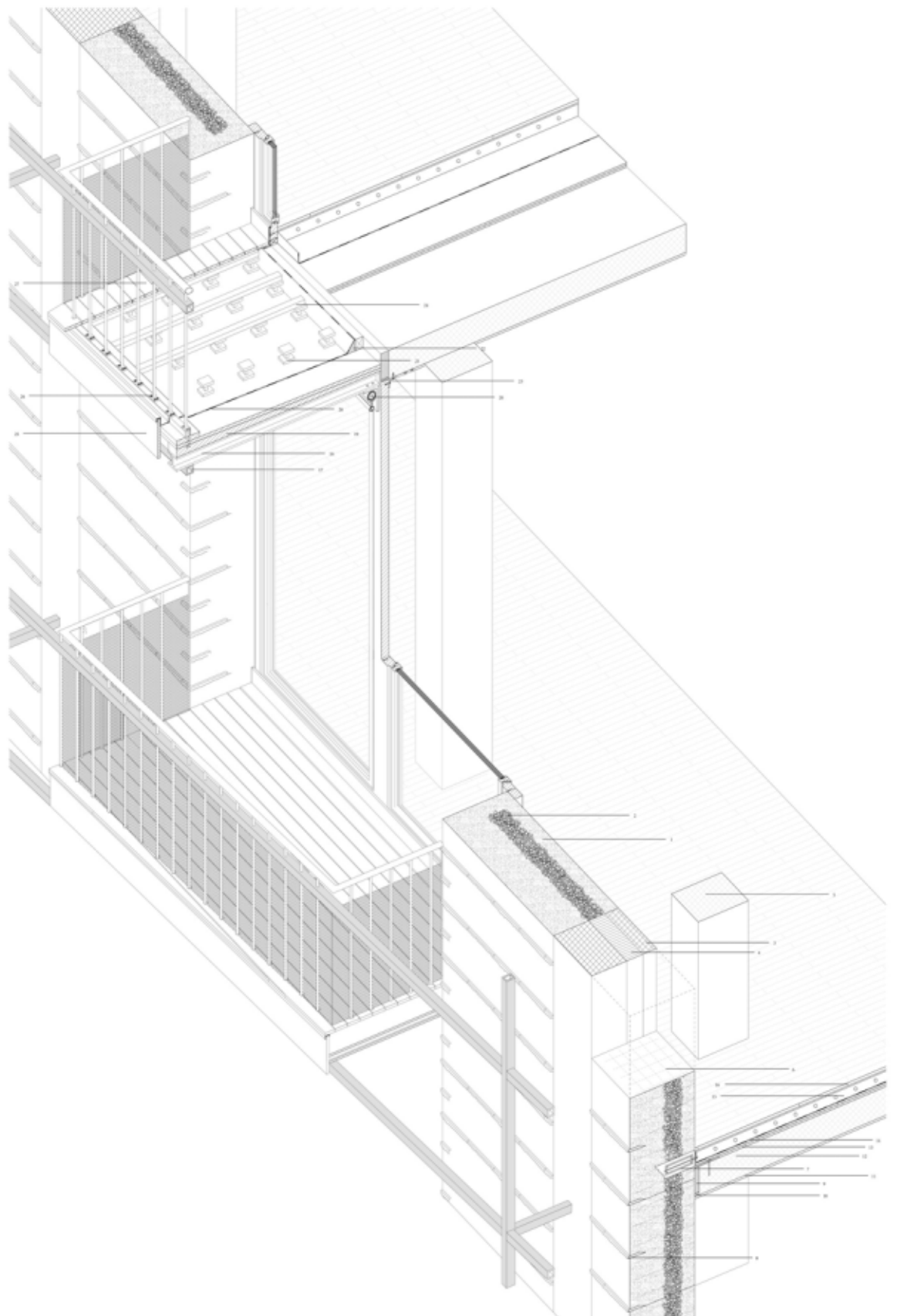
Hotel Floorplan and Topfloor



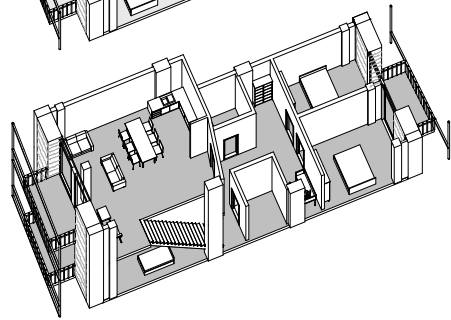
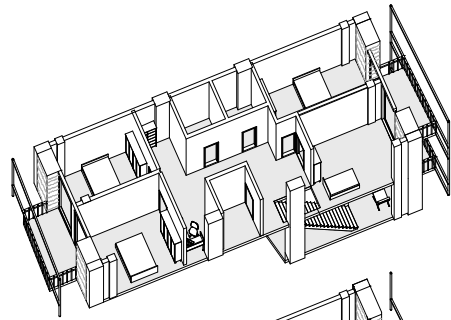
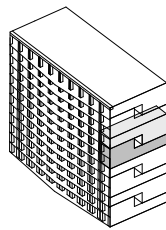
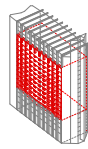
Typical Floorplan



Ground Floor and First Floor



Axonometry Facade



Typologie Habitation



Section

