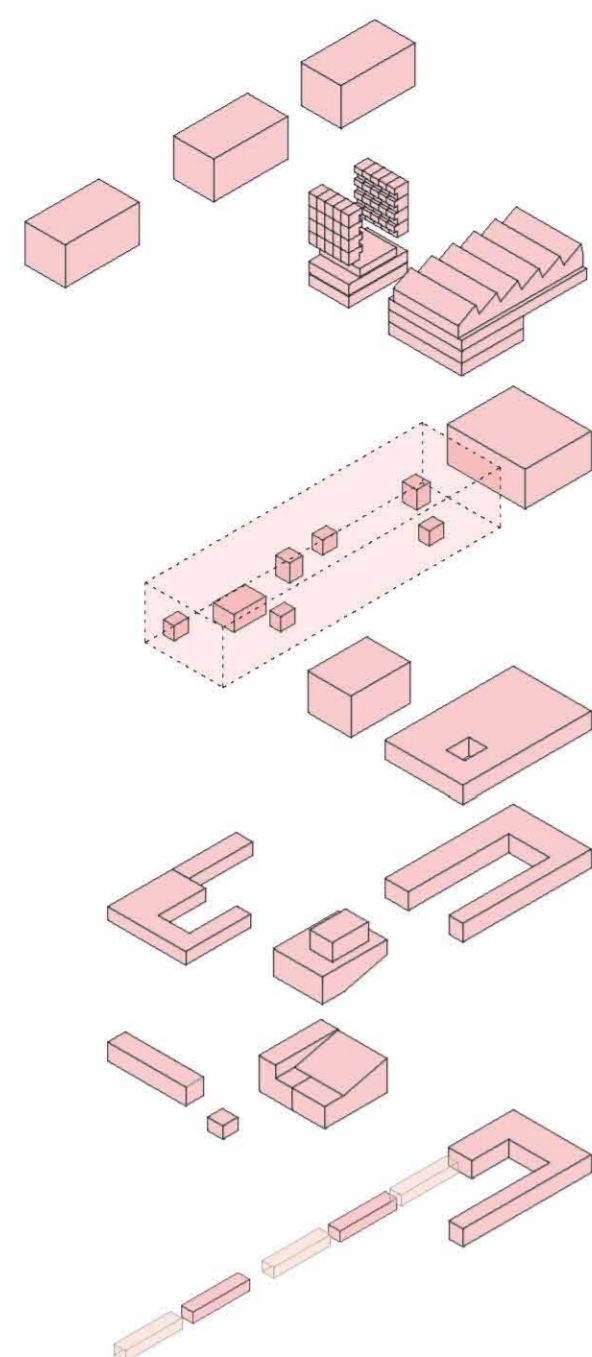
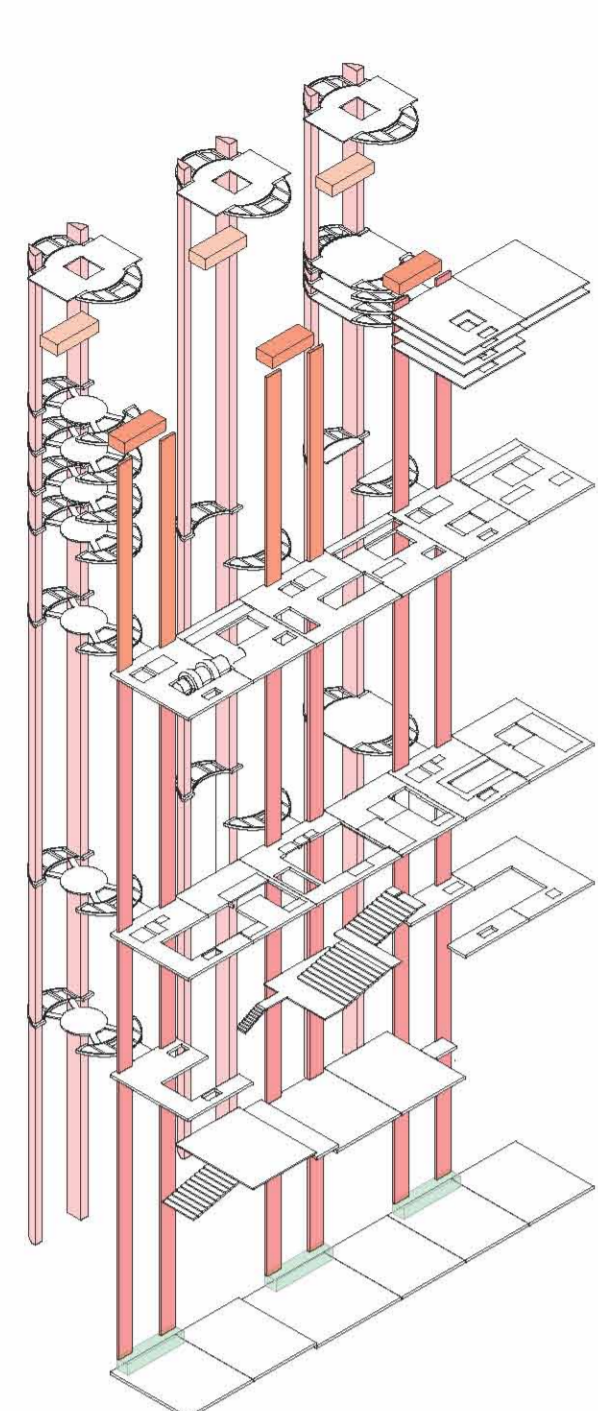


CLIMA



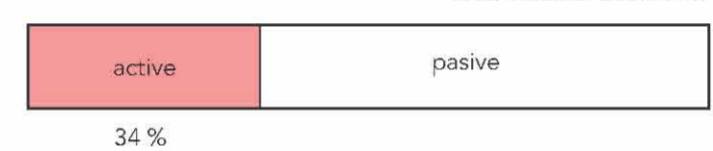
Sectors/Distribution

The building is divided into six different sectors. Each one has its own treatment system. In the towers it is based in the top area and in the nave sectors it is placed over the nave-tower connection bridge. Through this system, jeopardizing the environmental conditions of the public space underneath the building is avoided.

Each treatment unit has a heat pump along with a boiler that thermally acclimatizes the air in a treatment station, where its quality is controlled too. From here it is driven into the acclimatized rooms through an air conduction system. Inside the towers it is distributed vertically in the north block, and in the nave the conductions are placed in the north facade porticos.

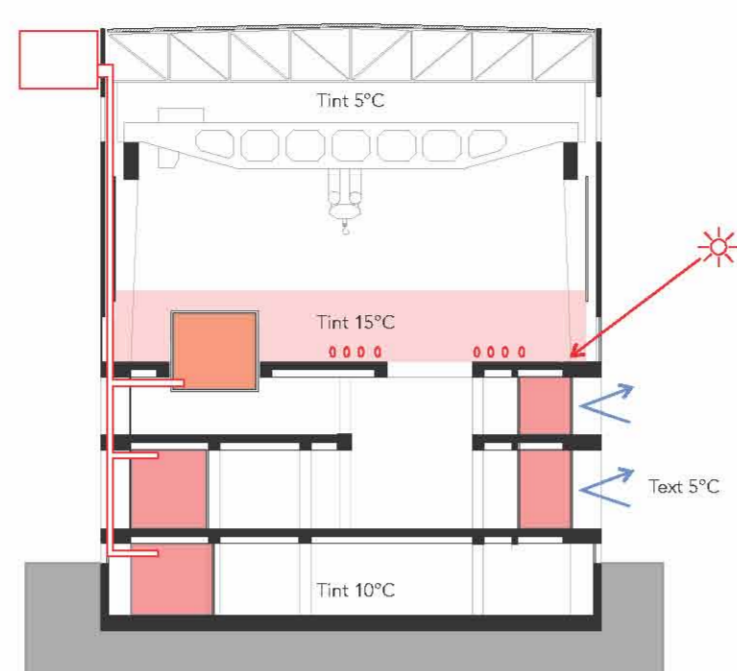
In some cases, the return air is driven through the non-treated spaces, making the most of this air which still retains quality, to acclimatize indirectly. To guarantee quality air in the toilet facilities, a forced ventilation system is installed as stipulated by regulation.

BOX in BOX



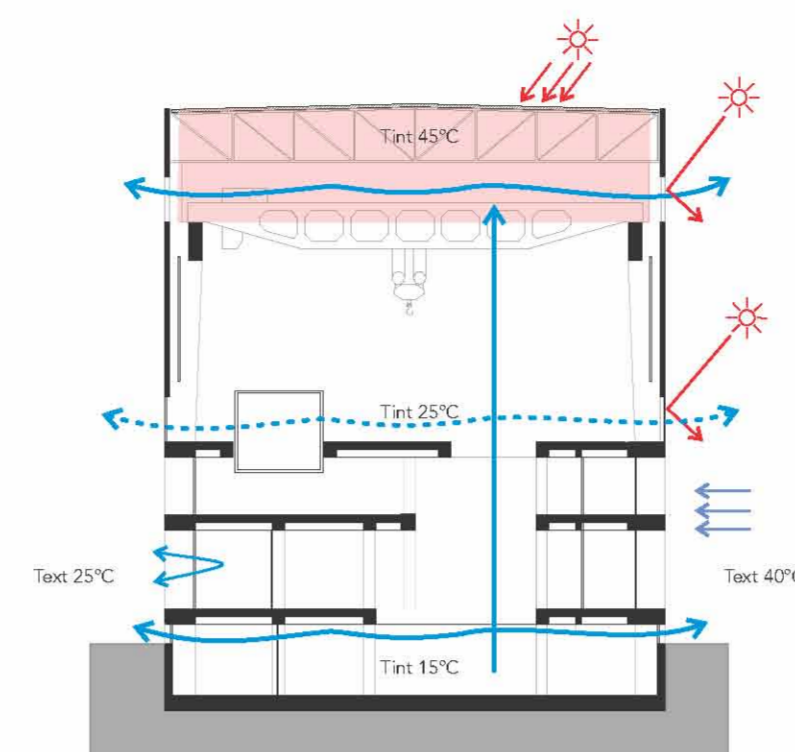
The extraordinary dimensions of the built volume make the total treatment of the air non-viable, speaking in both economic and energetic terms. A strategy with two methods of acclimatizing which provide a partial treatment is followed, reducing costs and environmental impact.

The original building is understood as a large neutral container, inside which different buildings of autonomous functioning are introduced. The building envelope of the original nave is a surface that regulates the air exchange with the exterior, achieving through this the contribution of natural ventilation to acclimatizing the interior space.



Winter

La concepción de la totalidad del envolvente del edificio (cubierta y fachadas) como un elemento de captación de energía del exterior y la consideración del espacio interior como una masa acumulador de inercia térmica. En la turbine gallery controlando los movimientos del aire y ayudándose de un sistema puntual se logra una franja de 4 metros con unos niveles de confort aceptables. Los retornos de las cajas tratadas se pueden efectuar a través de la sala de turbinas.



Summer

Principalmente el uso de la refrigeración nocturna para disipar el calor acumulado durante el día. La protección solar mediante todo tipo de lamelas. La diferencia de temperatura entre la fachada norte con las sombras de las torres y la soleada fachada sur este asegura un tiro natural transversal. Contribuye la excavación bajo rasante de la planta sótano, ampliando el gradiente de temperatura entre la ante-subsuelo y la parte alta de la nave. La ventilación cruzada de la bolsa de aire caliente acumulada en la cubierta.

Comfort

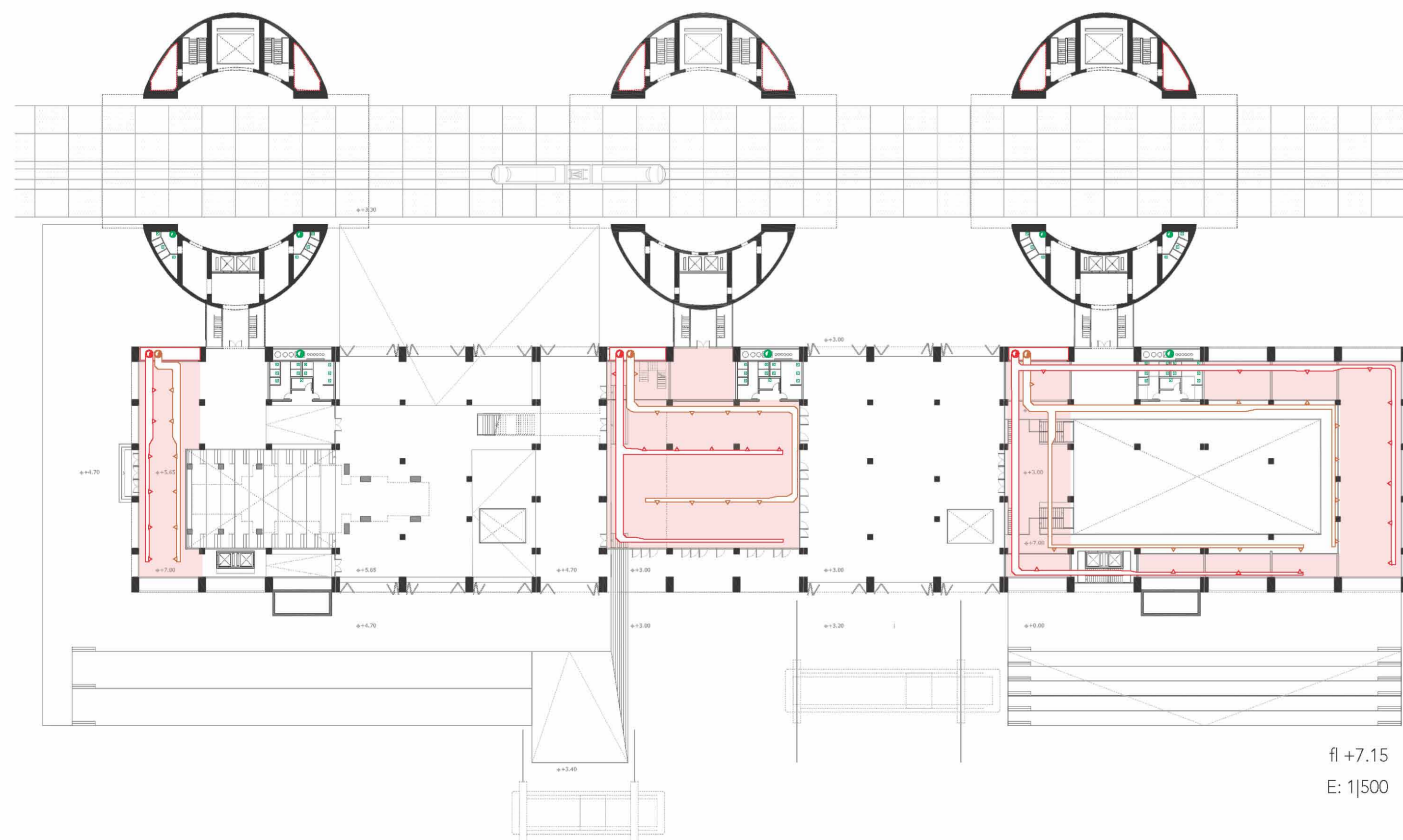
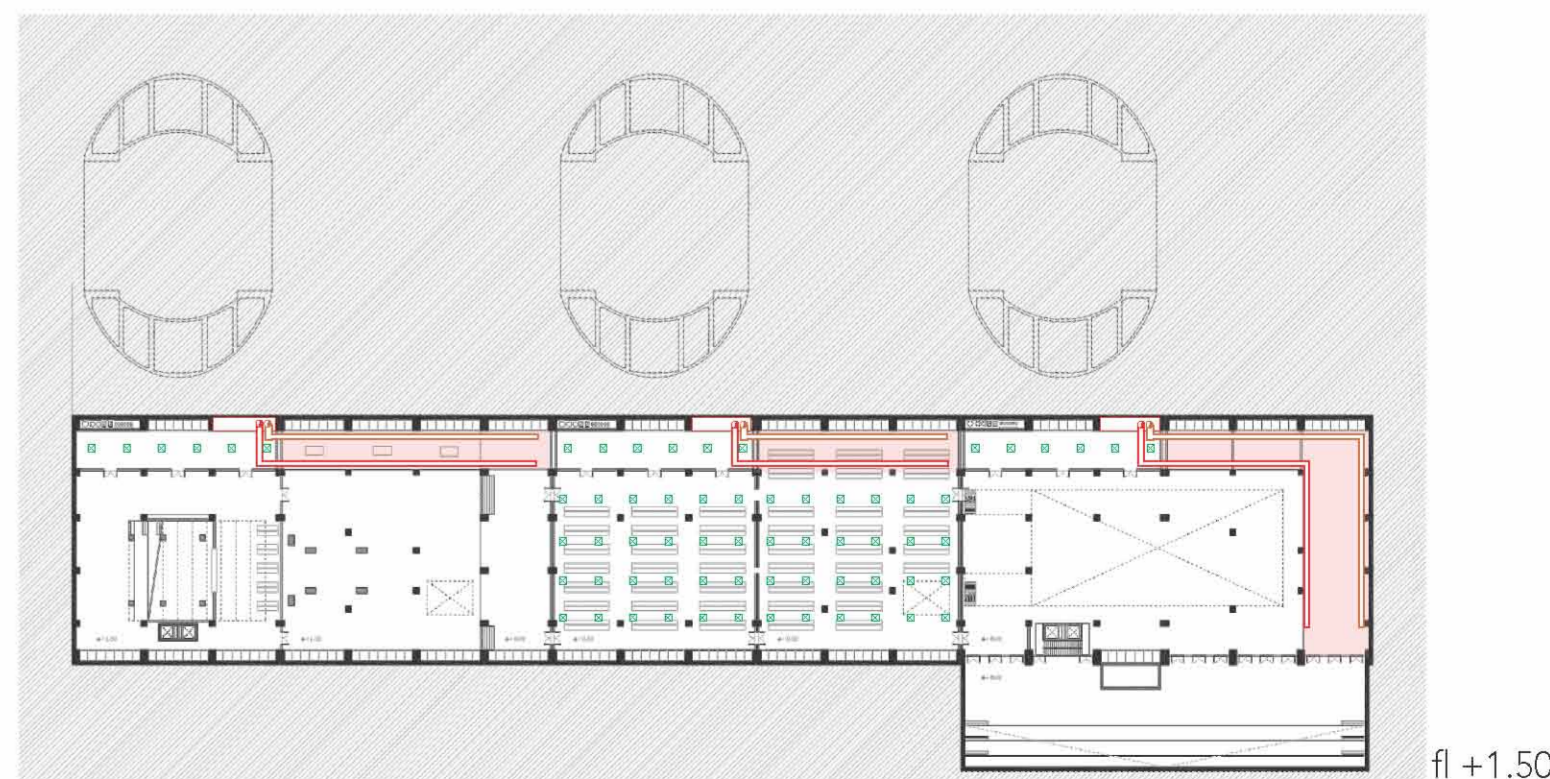
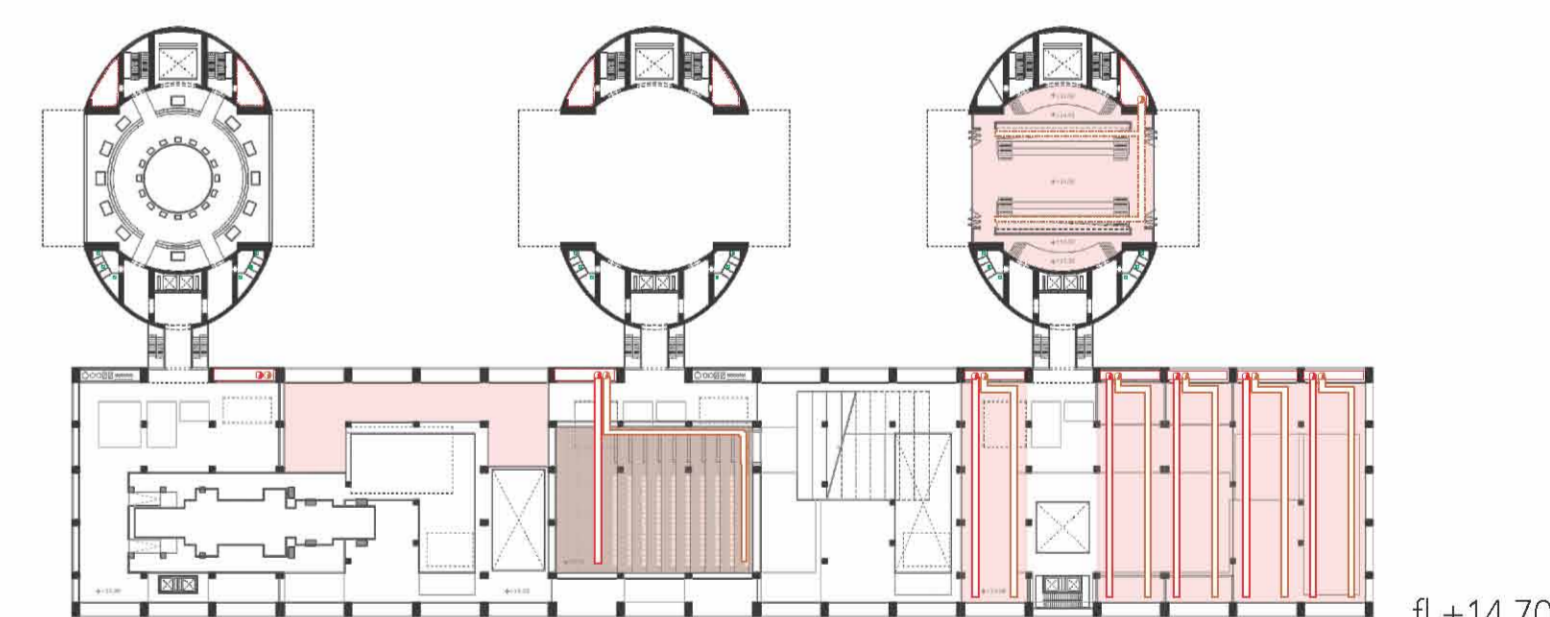
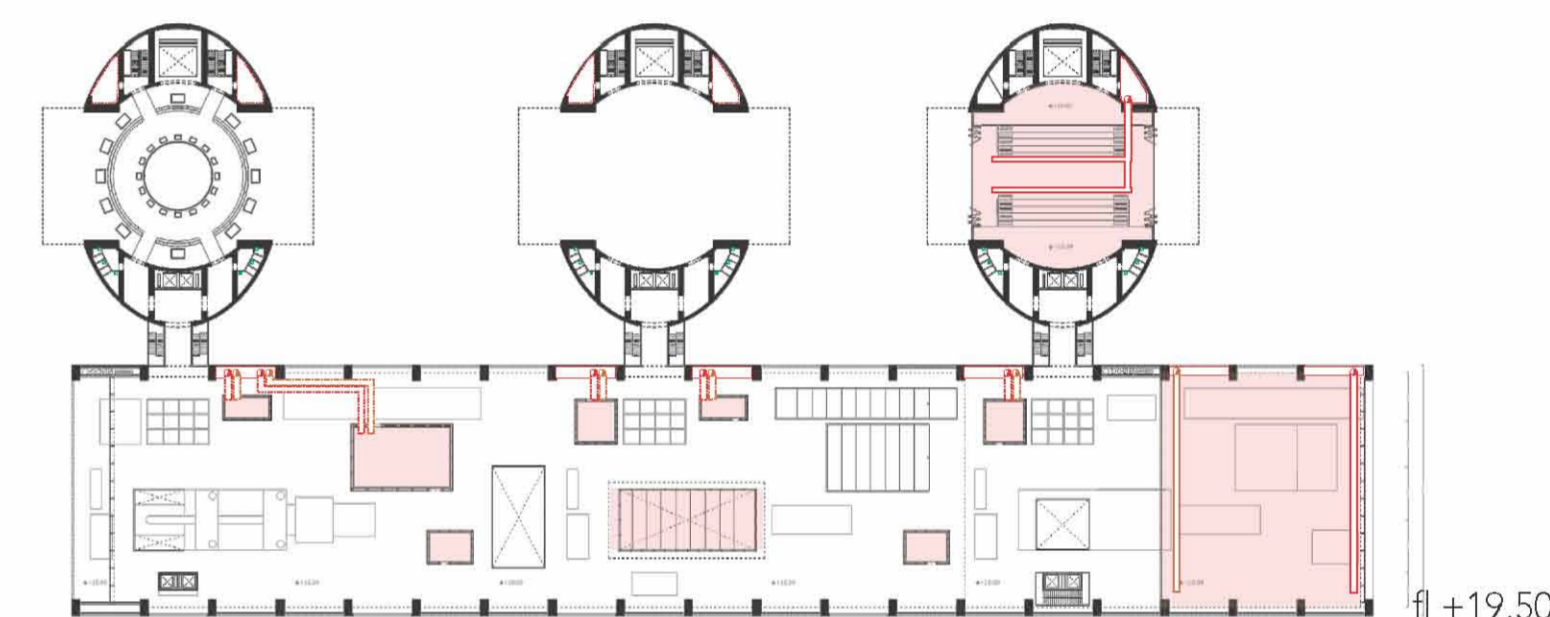
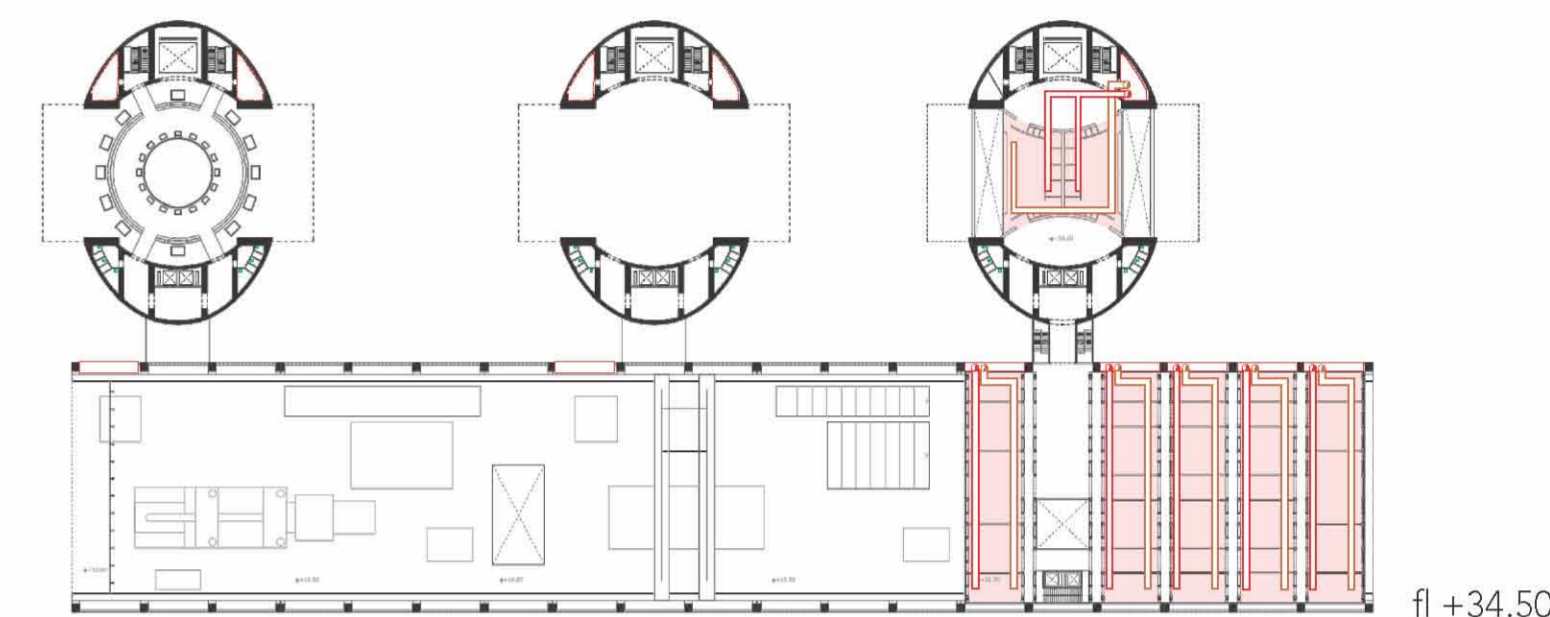
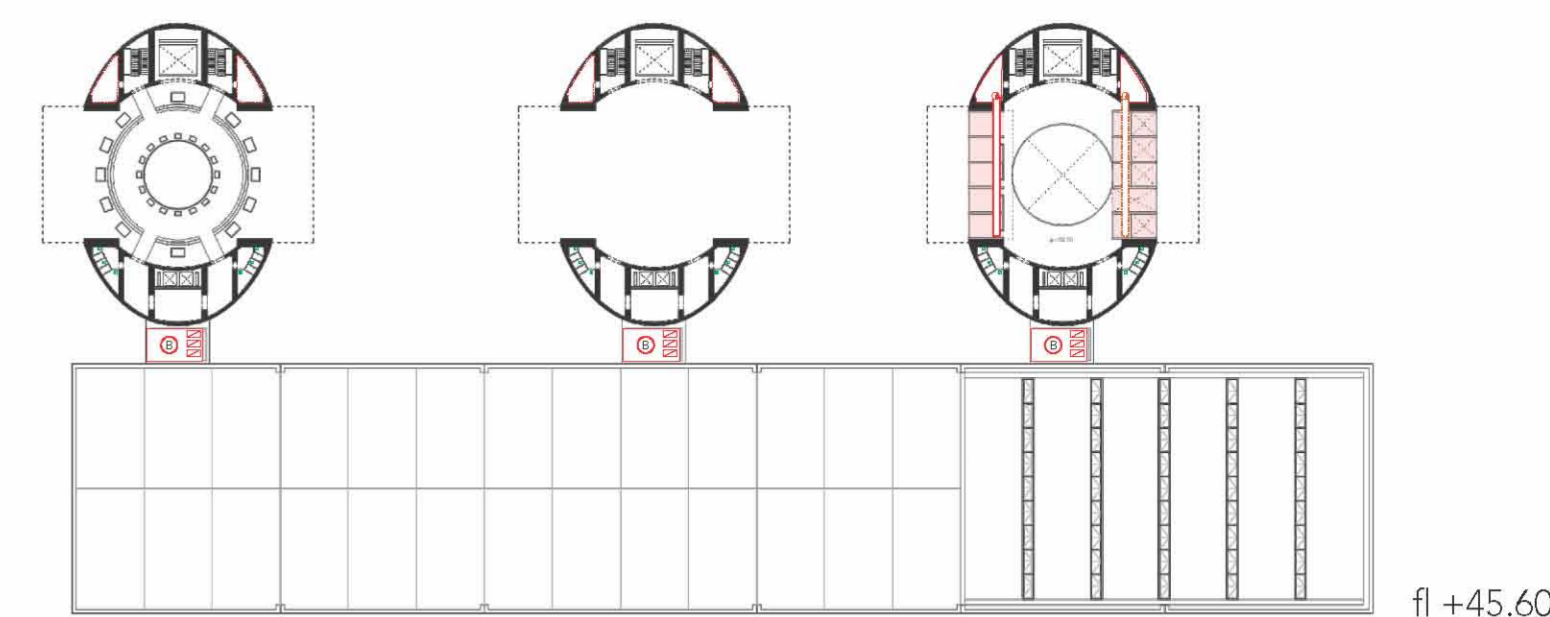
The building contains two climatic areas. In one of them, the confort is actively obtained using technified systems along with some energy consumption. These make up the 34% of the total air volume.

The different volumes are treated separately, allowing a reduction in energetic cost, as the spaces are only treated when used, adjusting the peak use in each closed area independently. They are understood as boxes inserted inside the structure so no energy is wasted on heating up the thick concrete elements. The volumes of air renovation are calculated to adjust the air distribution in the most efficient way.

For the remaining spaces, the confort levels are passively achieved. Through systems of solar protection and collection, winds, inertia... accepting that during some winter periods the levels will be lower than the standard, but creating a spatial continuity that would be impossible with the air conditioning seal.

Air circulation volumes per unit

- Top tower gallery: 9.500m³ x 8v/h = 76.000 m³/h
- Viewpoint: 9.500 m³ x 8v/h = 76.000 m³/h
- Restaurant: 9.500 m³ x 8v/h = 76.000 m³/h
- Dwellings: 2.050 m³ x 6v/h = 12.300 m³/h
- Artists facilities: 53.166 m³ x 6v/h = 318.996 m³/h
- Ateliers: 29.400 m³ x 6v/h = 176.400 m³/h
- Auditorium: 4.050 m³ x 10v/h = 40.500 m³/h
- Theater: 9.000 m³ x 10v/h = 90.000 m³/h
- Exhibition boxes: 2.000 m³ x 8v/h = 16.000 m³/h
- Labs: 800 m³ x 6v/h = 4.800 m³/h
- Administration: 800 m³ x 6v/h = 4.800 m³/h
- Shop: 600 m³ x 8v/h = 4.800 m³/h
- Bar: 4.500 m³ x 10v/h = 45.000 m³/h
- Restoration: 600 m³ x 6v/h = 36.000 m³/h



- Duct forced air
- Forced air extraction
- Vertical conduction treated air
- Vertical conduction treated air
- Vertical conduction return
- Duct treated air
- Duct return
- Duct in floor treated air
- Duct in floor return
- Vertical shaft turbine hall
- Vertical shaft towers
- Vertical shaft towers stand by
- Heating pump
- Air conditioning unit

Legend

Floorplans  
E: 1|1.000