



common plateue as a vivid outside space that connects all Dimnikobau buildings

Structural design

Both buildings use mainly simple 8 x 8m structural raster, which is the most rational and economically efficient building system in Slovenia, due to the local industry and anti-seismic requirements. The DB III building uses the metal structure with carefully placed diagonal reinforcements only on the last floor and over the big opening on the south façade, where more significant spans are needed. The columns are placed on the façade to allow maximum office space flexibility and the earthquake stability is achieved mainly with emergency staircase and elevator cores.

Energy design and technical equipment

We plan both buildings as low energy consumption with active and passive measures to achieve state-of-the-art energy concept. The passive aspects are compact building mass which maintains low façade / mass coefficient, external sun shading, and high-performance façade. Furthermore, the DBIII atrium follows the concept of the best in the word energy efficient buildings, which use atrium as the buffer that preheats the air in winter and cools down the building in summer.

The atrium functions in different ways depending on external conditions. In the summer, the building is pre-cooled during the night using the cold air that enters at ground floor and expelling the hot air at the top of the atrium. In the spring and autumn, the chimney effect of the atrium allows natural ventilation draft, cooling down the center of the building during the day. During the night the atrium ventilation is closed, maintaining temperature stability of the building. In cold days, the used air from the office flows towards the top of the atrium. On the roof, the energy heat recovery unit reuses its energy to pre-heat the fresh air that enters the building.

The active aspect is the integration of all the mechanical elements in a centrally controlled system, use of ground heat pump, very efficient heat recovery unit, use of solar cells on the roof for hot water and solar energy generation. The natural ventilation of the building is controlled by a central system that automatically opens and closes the grills-and windows on the top of the atrium and the ground floor.

All the energy is transmitted through hot and cold water circuits from central heat and cooling station to individual units in each office area. For the office areas, we propose cooling beams that are integrated into the ceiling and provide the best comfort and individual area regulation. The dispersion of the cooling beams through the whole ceiling allows easy reconfiguration of the office area.

Most of the air conditioning machines (chillers, heat recovery units) are on the roof - they do not occupy any extra space. In the basement are pump station and telecom center and on the ground floor the transformation station. The air conditioning machines for lobby-gallery, restaurant, and recreational facilities are inside the hanging ceiling over the restrooms which reduce the need for technical space.

As the building structure is mainly concrete, the structure functions as the mass that helps to overcome the peak hours, further reducing the need for heating and cooling.

To achieve excellent ambient illumination, we recommend the use of general ambient lighting connected with natural light and presence sensors in combination with additional personal lamps.

Security

Both buildings have two lever security control access. The first access control is in the lobby on the ground floor level or at the entrance to the garage (speed gates). The second access control is at the entrance door of each office unit. Both buildings have planned 24h hour's surveillance system that includes hi-resolution cameras with infrared detection and different sensors.

Fire safety

Both buildings comply with standard fire safety regulations (positions and distance to fire escape staircase). The DB III due to its height has a dedicated firemen elevator that has direct access from the exterior in the ground floor. We propose to use a dry sprinkler system which guarantees the lowest possible damage in case of fire and allows the use of extensive fire departments in conjunction with NFPA fire norm, which is permitted by Slovenian legislation. The paved areas around the building permit the fireman truck access from three sides of the buildings.

Acoustic

To achieve right acoustic conditions, the whole hanging ceiling functions as acoustic absorbent. The floor carpet in the office space tiles also helps to absorb the noise. In the atrium space the wooden cladding, partly absorbent, avoids the hard parallel surfaces (glass) avoiding the unwanted sound reflections.

Cost-effectiveness

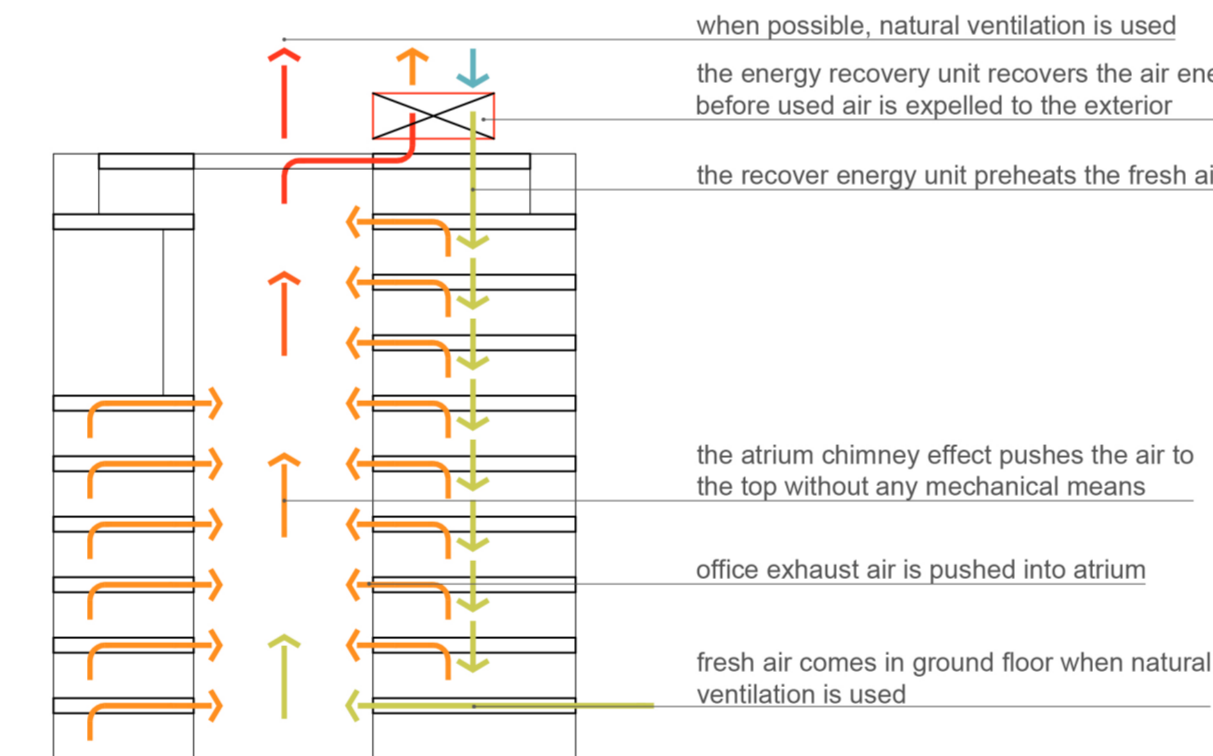
The proposal intends to be cost-effective in several vital aspects. The structural grid is standard, using some unique structural element only in several key areas. The building volumes are compact, minimizing the surface of exterior façade, as the façade towards atrium is simple division walls. The façade is single with no mechanical elements that would need additional costly maintenance. The office layout is very rational with a constant distance from façade to corridor allowing easy and cost-effective rearrangement of office space with standard division walls. The corridor area is minimum achieving the ratio NPUG/GFA of 75%. The atrium functions as a "plenum" for exhaust air, reducing space needed for vertical shafts.

Low-maintenance strategies

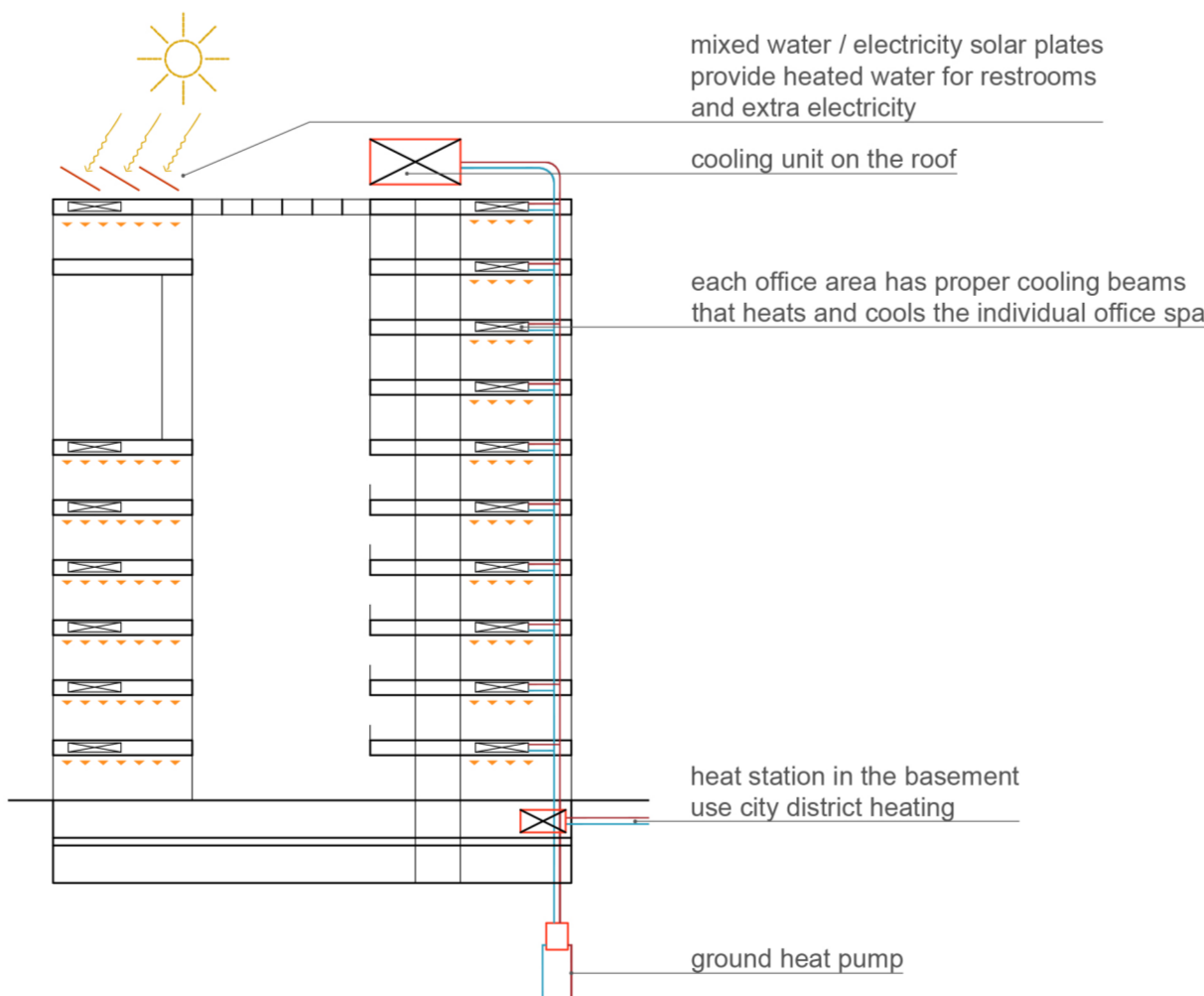
The proposal focuses on several key areas to achieve low maintenance buildings. The facade is simple, with no mechanical or moving parts and with materials that can sustain harsh climate (glass and aluminum). The installations are intelligent, but on the other side repetitive and straightforward, allowing central monitoring and fine-tuning optimization. The interior materials, especially on the ground floor, are high quality (stone pavement). All interior wood elements have semi-transparent varnish treatment that allows easy cleaning and color stability.

Sustainability

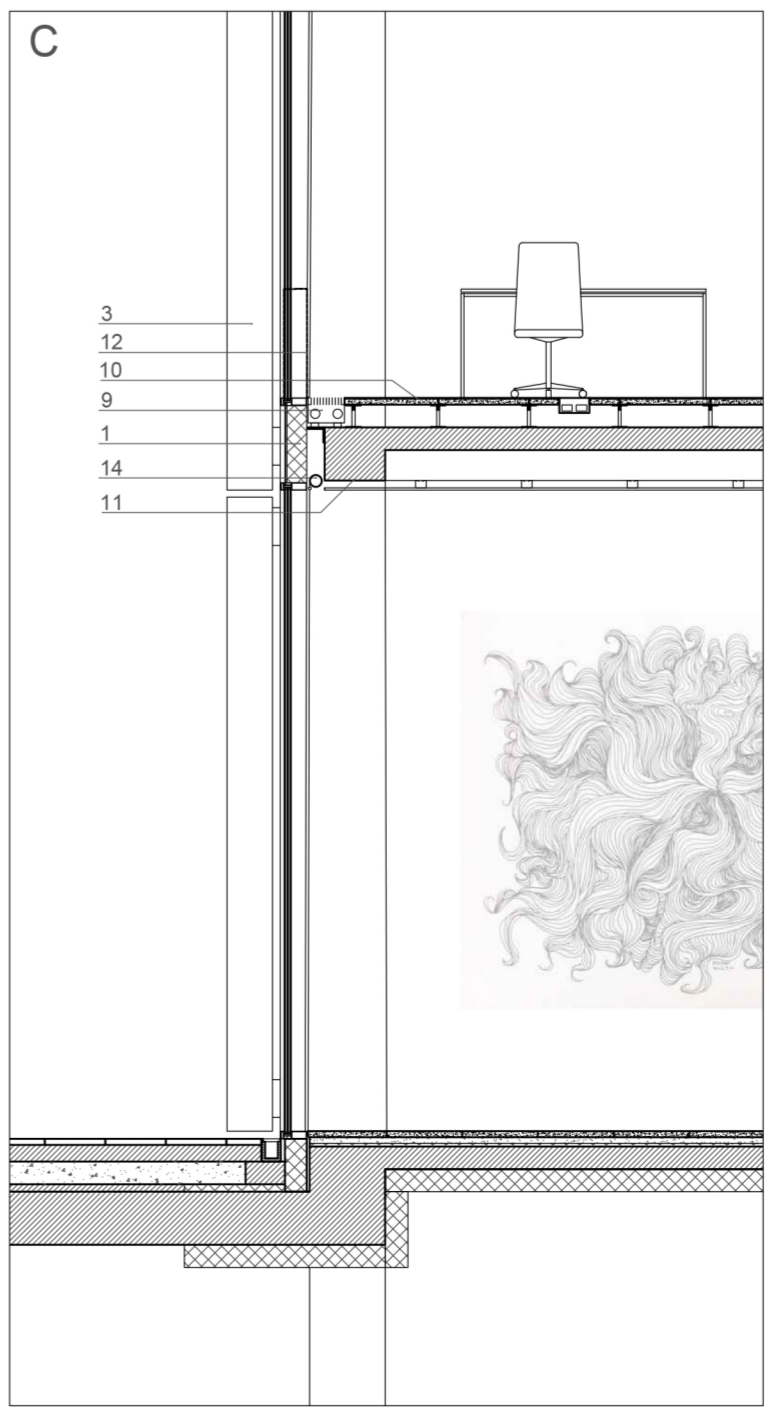
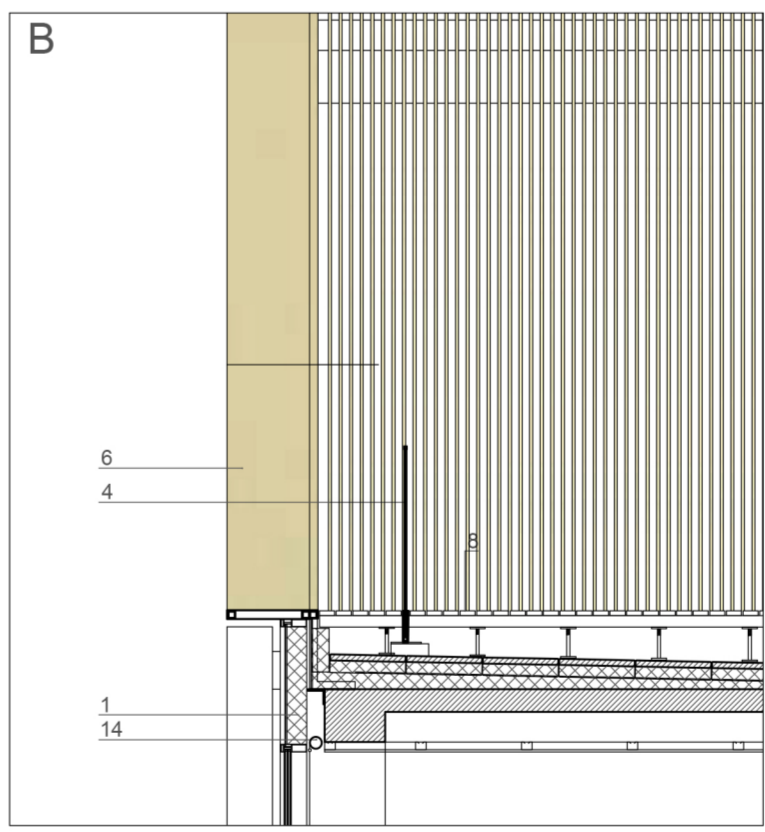
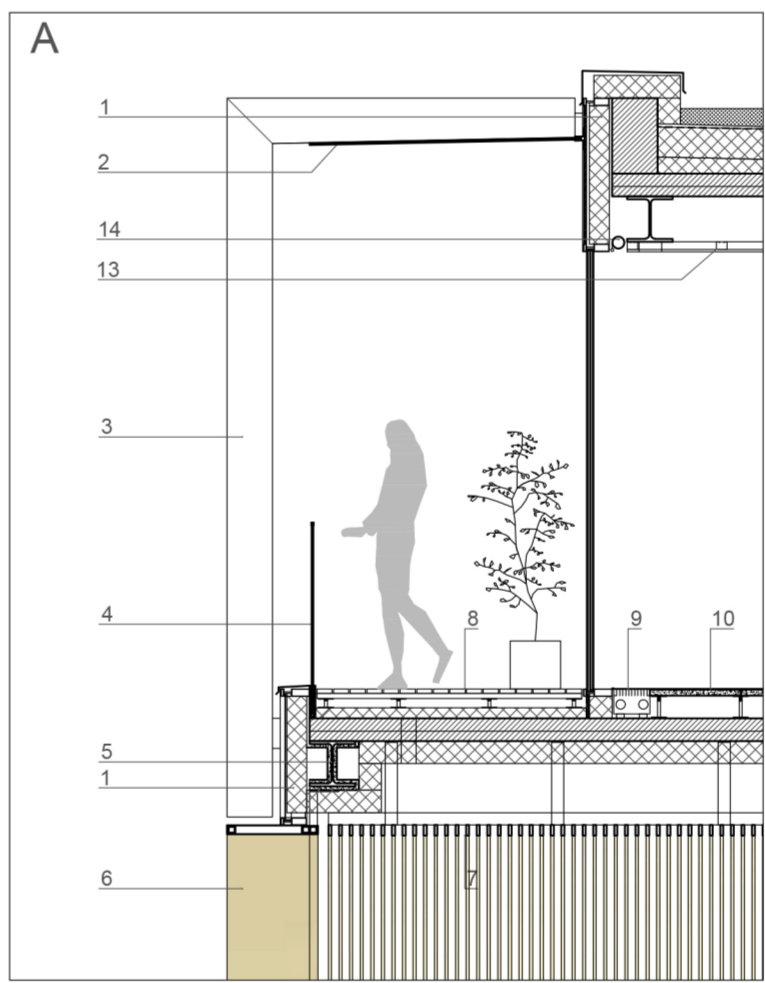
Apart from energy efficiency, the buildings intend to use as much as possible sustainable materials. We clad the interior atrium of DBIII building with wooden profiles lacquered with semitransparent white varnish. The façade frames are also made out of wood and clad on the outside with recycled aluminum to resist harsh Ljubljana's climate. The internal division walls and ceiling are also planned to use as much wood as possible. The carpet that covers the office floor is from recycled nylon. The exterior sun shading elements are from painted recycled aluminum.



atrium as ventilation buffer and natural ventilation key element



energy managment diagram



facade section 1:20