SUSTAINABILITY

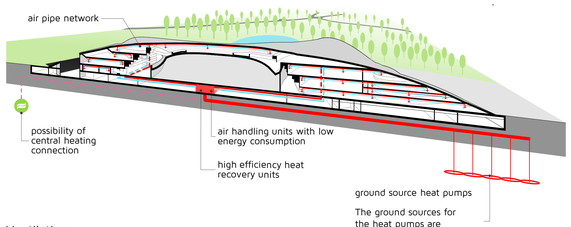
Energetic Requirements

The majority of the energy consumption featuring modern buildings is originated from cooling requirements and from ventilation. The conception of the buildings is designed the way decreasing these most important requirements applying popular and innovative solutions.

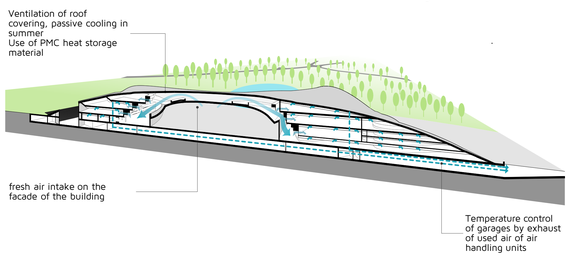
Due to the architectural design of the building and the public park feature of the City Park (Városliget), it is not advantageous to apply outdoor machinery installation, thus the heating energy supply of the building is going to be solved mostly by geothermic heat pumps. Besides satisfying cooling requirements the heat pumps are also used to fulfil the heating requirements of the building. This solution may ensures a higher rate of renewable energy recycling, approx. 40%, compared to the prescribed 25%.
The ground sources for the heat pumps are installed behind the building outside the design area. Ground source heat pumps ensure the most environmentally friendly energy supply. The low- temperature secondary systems allow to use the ground probes as a passive way of cooling. In order to ensure a secure heat supply of the building, during the construction we maintain the possibility of the central heating connection.
The electric energy consumption of the air handling units is minimised by decreasing the velocity values applied within the air pipe network. The maximum velocity in the main collectors is 4 m/s and in the side branches it is 3 m/s. The energy efficiency of the ventilation is increased further due to the high rate of heat recovery and CO_2 detection.

Heating/Cooling energy supply

rate of renewable energy recycling **40** %



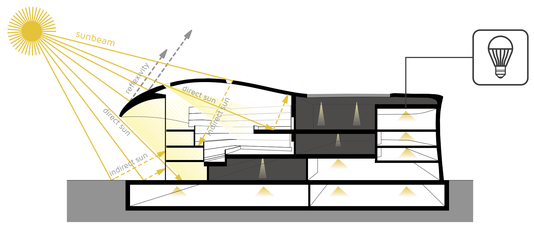
Ventilation



Considering the roof covering features of the building, the rejection of used air takes place through the open garage in the basement floor using it for tempering the open parking areas. Fresh air intake is realised on the facade of the building.

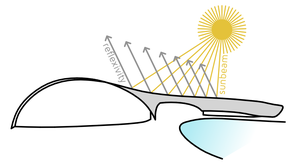
- Everywhere in the building, where it is possible, source ventilation is used. Source ventilation ensures the highest comfort and the less energy consumption in high-ceiling spaces.

- In those parts of the building where the function of the room makes possible natural lighting is provided, so in corridor areas, public spaces, offices artificial lighting requirements are reduced. The energy demand of the lighting is reduced further in naturally lit spaces using light sensors and, where the function of the building allows, installing presence sensors. Furthermore, high luminous efficacy LED light sources are used. Thanks to this control solution, an approximately 50% saving is available in the lighting field compared to the commonly used lighting systems.If we take into account also the approx. 50 000 h lifespan of the light sources and the fact that the light obtained this way can be regulated not only in brightness but even in colour temperature, we apply the most advanced and forward-thinking lighting system which exploits the maximum of the current technical possibilities.



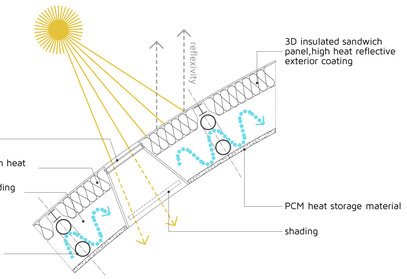
- In a part of the not exhibition areas besides the mechanical ventilation natural ventilation possibility is also ensured and in some areas we use exclusively natural ventilation. The advantage is that by providing natural ventilation the occupants have greater life comfort even inunfavourable air temperatures.

- In rooms with natural ventilation heating requirement of the building is reduced by using PCM heat storage material. PCM heat storage material takes up cooling heat charges in operation time without energy investment. The heat accumulated in the heat storage material shall be removed by ventilation at night, in order to ensure that the heat storage material be able to reduce cooling requirement. Cross-ventilation is provided within the building structure. Natural removal of the heat accumulated in the PCM material is achieved by the ventilation at night of the space between the external insulated layer of the spatial lattice girder and the internal space limiting structure containing PCM material.

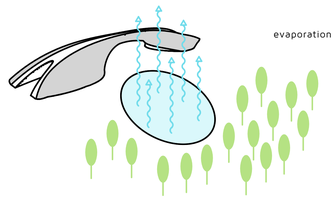


roof covering, surface with high heat reflexivity

Ventilation of roof covering, passive cooling in summer
Use of PMC heat storage material



- The environment of the building can be cooled down using space cooling, thus the comfort in the environment of the building can be increased and at the same timecooling requirements of the building can be reduced.



- The electricity supply of the building is designed by double sided independent electricity supply. Due to environmental, operational and economic considerations no dieselgenerator is planned to be installed.

- Considering the design of the building no classic solar system has been taken into account. At the same time we are examining the possibility that using transparent solar panels, replacing some glass surfaces an individual small power plant of approx. 50 kVA may be installed which could reduce the operating costs but its permitting does not represent any particular complication.

- A digital building was designed - as it has already been detailed in the paragraph about the lighting which assumes that a significant IT network shall be built. Systems linked to the operation are separated from the classic data network at physical level as well, so both functions can operate separately too which helps to increase data security. The advantage of the digital building is to facilitate the operation since the majority of the networks can be operated through a monitoring station too. This solution allows a significantly reduction of the operating cost elated to the building.

Health and Comfort

The spatial design of the building ensures good working conditions for the employees. In case of the vast majority of office workplaces natural ventilation and lighting are ensured. Due to the energy efficiency, lighting is controlled by ambient light sensors and heating-cooling networks are latched.Each long-term stay room has an automatic and individually controllable shadingstructure.
Health and comfort feeling is increased by the application ofthe low- temperature secondary systems.
Changing room facilities with showers ensure further comfort of the users traveling by bicycle and bicycle racks support the preference of alternative transport possibilities.

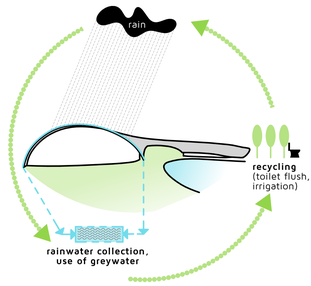
Water Management

During the design phase of the building one of the most important design parameters is water saving. Water saving is fulfilled at different levels in the case of the building:

- Grey water collection and recycling
- Rain water collection
- Applying water saving fittings
- Waterless urinals

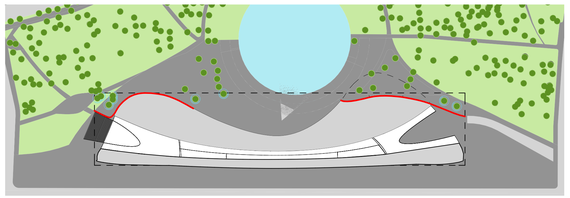
According to the design of the building rain water is collected and used to reduce water consumption in the building and to irrigate green surfaces. In Budapest besides rainy months there is a relatively large amount of rainfall during other months of the year, so this rain water recycling system may be economically operated. Rain water recycling is completed by grey water usage as well.

Among the sustainable urban water drainage solutions we apply buffering and recycling of the collected rain water. In addition, further green areas are foreseen in the surroundings of the building.



Ecology

The design concept of the building provides also an opportunity that diverse habitat structures (wetlands, bushy, wooded and grassy habitats) create in urban environment. The site's ecological growth is based on the diverse ecology.



Used Materials

Regarding the used materials, environmental awareness and sustainability considerations increase healthy and comfortable sensation and improve the working conditions of the users of the building. Low emission of harmful substances in the materials is the basis of the healthy inner ambience. Furthermore, concerning the used materials we do our best to give preference to recycled materials (recycled aluminium cladding, recycled concrete foundations, insulation and interior finishing materials from renewable or quickly regenerating resources). Wood used in the building are from a fully sustainable forestry,this way also minimising the CO_2 footprint caused by the construction and the building.

- Recycling
- Recycled concrete for foundations
- Insulation from renewable or quickly regenerating resources
- Waterproofing from renewable or quickly regenerating resources
- Recycled aluminium for casing
- Finishing materials from renewable or quickly regenerating resources