

HEALTHY HOMES design competition Building Design green heart terrace



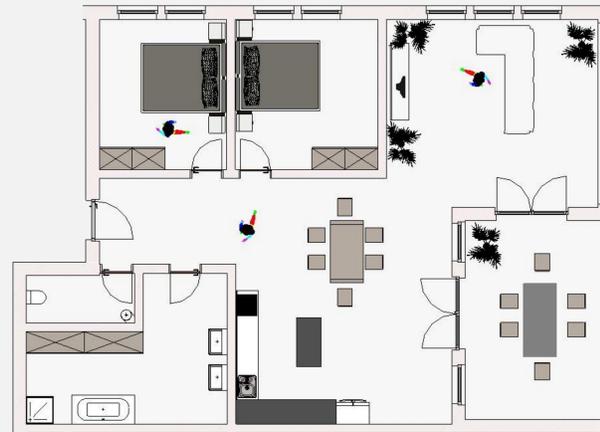
Our Building

We designed 20 apartments with a gross floor area from 60 m² till 170 m². All apartments are equipped with bathroom, kitchen and at least two other rooms, for living and sleeping. In addition, each apartment has either a balcony with a great view of the water and Rotterdam or a large bright, glazed bay window. Our building has a variety of common use spaces. Whether the football table in the entrance area, the co-working area on the first floor or party room and children's playroom, everything is integrated. The outdoor area leaves nothing to be desired with vegetable garden, playground as well as pool and barbecue area.

On the following pages we describe each floor with its respective functions individually to give you the best possible impression of our design.

Our design strengthens the togetherness of all residents in an efficient building and promotes a healthy lifestyle for each individual.

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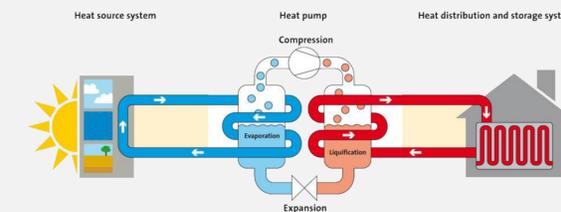
Heating concept

The green heart terrace is heated by a water-water heat pump. As heat source, water from the adjacent river will be used. This provides constant temperatures above 4 °C and thus an optimal operation of the heat pump. Through the floor, the heat from the heat pump is transferred to the apartments. In the summer, cooling would thus be possible even if outside temperatures rise in the coming years. The hot water is produced with thermal solar system on the roof and the heat pump. The roof area needed for this is fully possible with the common roof terrace. Ventilation through the windows in summer also contributes to passive cooling of the individual apartments. All windows can be tilted or, in some cases, opened completely. Of course, attention must be paid to the danger of falling, especially in children's rooms. Windows can also be locked here.

Cooling concept

Several sensors are installed in each apartment to measure the air quality. The current air quality can be displayed via the tablet in the entrance area of each apartment. With the help of this simple display, the resident can then ventilate his apartment. To ensure that the ventilation through the windows in the apartments works optimally, each window has an intelligent tilt function. This allows windows to be tilted in such a way that sufficient fresh air can flow in but, for example, rain cannot penetrate if the window has been forgotten to close.

Tablet/Sensor information



west



north



south



east

Sustainability of the project

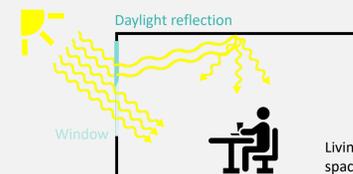
Ecology: The building was designed to use as little energy as possible, or to generate a large part of it itself, and to use sustainable resources for energy generation, such as the sun or the adjacent river. The fruit and vegetable garden binds carbon dioxide and releases oxygen, as well as producing healthy and inexpensive food.

Economy: The many common rooms result in significant cost savings for the residents, since, for example, there are no travel costs, or the purchase of a washing machine is not necessary. In addition, high-quality equipment (kitchen, bathroom, etc.) is included in the rent or purchase of the apartments.

Social: The building is a perfect example of what social togetherness is. Playrooms for children indoors and outdoors, a party room for the residents or a communicatively designed entrance area make it possible to live together to a higher level.

Daylighting

The incidence of daylight is optimized by the alignment of the building. Most apartments have an east-west orientation. Large windows provide every apartment with enough natural light. Due to the sun position, which is lower in the East and West as in the South, each apartment is supplied with sufficient daylight. Natural daylight should always be used in the best possible way. However, if direct daylight into the home is ever too much, sufficient diffuse daylight can be brought to the ceiling by light redirection to avoid direct radiation but still provide sufficient daylight. In order to limit the solar load on the south facade, a blind is fitted to all windows. This allows each inhabitant to control the solar radiation individually. Here, too, there is of course the option to control the external blinds via sensors. Thus, thermal comfort is provided even when the residents are not at home.



CO₂ neutrality

In our entire building, we strive to waste as little energy as possible. Of course, this applies to all areas. For electricity generation we have planned three areas with PV modules. Thus, the house is supplied with green electricity. If the power demand should be higher, of course only green power is purchased from the energy supplier. Thus, the use of electricity throughout the house is CO₂ neutral. Also, for the hot water production and the heating, we fall back on a sustainable and CO₂ positive source, the adjacent river.

The heat demand per square meter of living space is 39,01 kWh/(m²a). For the hot water supply will be 7,82 kWh/(m²a) needed on top. That makes in total 46,83 kWh/(m²a) of effective energy.

The COP of the heat pump, which will be installed, is 5.8.

A detailed calculation was carried out of the program Hottgenroth, which is based on the DIN 18599 – 2018 residential building.

Artificial Lighting

Of course, the building is also equipped with artificial lighting which can be turned on if the amount of daylight is not enough. In the complete green heart terrace are only use LED's to have the best sort off artificial lighting. Luminaires, we focused on warm (low) color temperatures (CCT Correlated Color Temperature). This supports the coziness and well-being in the apartments. For the corridors and common areas, higher color temperatures are used to create a clear difference between home-apartment and common areas also through lighting. With building automation and the tablet on the wall in each apartment, all residence are allowed to change the intensity of the lighting to be inserted separately for each room. In other words, each luminaire is dimmable.

Energy balance

