Yotel Hotel Asterweg, Amsterdam, Netherlands

New BREEAM Excellent certified hotel built applying modular construction with prefabricated hotel rooms and technical system, with ground source heat pump.

Key facts

Building

Location	*Amsterdam, Netherladns*
Construction	*2019*
Heat distribution	*in building*
Heated area	*6.500 m² living*
Level of insulation	*high*

Heat pump and source

Number of heat pumps	*3*
Installed capacity	*300 kW + 270 kW*
Operation mode	*monoenergetic*
Heat source	*Ground source and air source*
Brand and type	*Keyter*
Sound level	

Heating system

Heat demand	
Heating temperature	*30 °C*

Domestic hot water

Type of system	*see overview*
Max. Temperature	*70 °C*
Circulation system	
Legionella measures	*thermal*
Storage size	*1450 litres*
Number of storage tanks	
Storage losses	
Temperature control	

Other information

Electric energy	
Consumption year	*kWh*
Investments costs	*unknown*
PV installation	*321 panels*

Lessons learned

The focus of the project has been on an in-factory building process integrating the technical systems in plug & play building components. Thus it has been possible to shorten the on-location building time, transport movements and increasing the overall quality.

Yotel Amsterdam is located on the Tolhuis canal in Amsterdam of 6,500 m² has 202 rooms and was delivered in June 2019. It consists of five variegated volumes in a park that vary in height, atmosphere and function. The volumes are built around patios with a collective space in the middle for visitors to the hotel and the public. The complex has a public restaurant with a terrace, a garden and a jetty.

By applying modular construction with prefabricated hotel rooms, it was possible to build faster with which time and therefore also interest profit was booked. It has saved about four months in this project. During the construction of the facilities on the ground floor, the production of the hotel rooms was already started in the factory. A higher quality is also achieved in a factory under the best conditions.

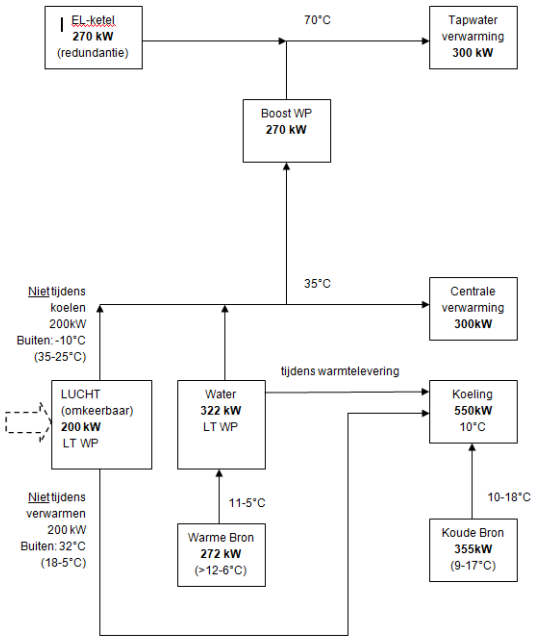
The hotel meets the requirements for BREEAM Excellent.

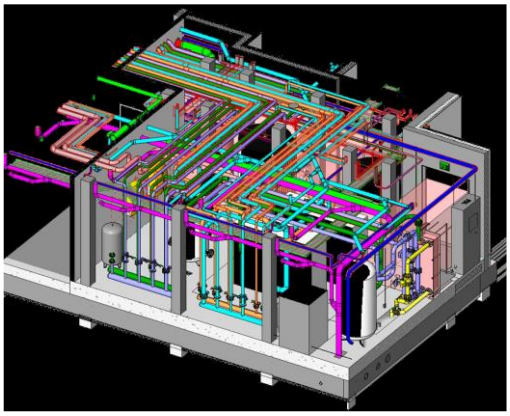
Important aspect is that because of the modular building system it contributes to an energy-efficient and waste-reducing building process. In addition, less transport of materials is required, reducing CO2 emissions.

The fact that the hotel rooms are prefabricated has little influence on the technical central installations. The ground source heat pump is separate from the modular concept and provides the entire hotel with space heating/cooling and hot water. In addition 321 solar panels have been installed to provide electricity. Various measures have been applied to reduce energy demand. The central heat pump supplies the basic load for heating/cooling and an air source heat pump has been installed for peak demands mainly for domestic hot water.

Yotel Hotel Asterweg, Netherlands Technical details

The Langia KZB series by Keyter consists of compact water-to-water heat





Air source heat pump Keyter Pacifica KWE 8210 I

Description of the technical concept

Three types of heat pumps have been installed:

- Low temperature ground source heat pump Keyter Langia KZB 2270Q LT – base – with R410A as refrigerant – 255kW levels the temperature at condenser side up to 27,1-35ºC
- High temperature boost-cascade ground source heat pump for generating domestic hot water at required temperatures Keyter Langia KZB 2160Q HT – boost R134a – 285 kW levels the temperature at condenser side up to 61-70ºC
- Air source heat pump Keyter Pacifica KWE 8210 I – with R410A as refrigerant. This heat pump is installed for cooling and regenerating the grounds sources.

The distribution system in the building is a four pipe system, where the domestic hot water is separated from the space heating distribution system.

Prefab does have a different influence on the energy performance of the building as it was possible in the factory to make the hotel units very airtight. Heat is recovered from the shower water in the hotel and separate stand pipes have been installed for this. Rainwater is also used to flush the toilets on the ground floor.

The Ursem modules have been stacked in 33 days into an eight-storey building. The rooms are delivered ready-made to the construction site. The walls, ceilings, shower, toilet, sink and air-conditioning units are already there. The modules are coupled vertically and the air treatment is looped through. Schouten Techniek for the installations and sanitary facilities can do the work on the prefab rooms at location in Wognum. This has the advantage that they don't have to travel for most of the work at the Amsterdam location.

High comfort requirements are set when building hotels. The temperature in a room must not exceed a certain temperature and the customer must be able to cool the room back to a comfortable temperature within an hour.

At first glance, strict comfort requirements seem to conflict with sustainability requirements, however that is not the case.