References

Day-care centre to be built with energy piles



Uponor involvement

54 piles, 1240 m2 Underfloor heating

Day-care centre to be built with energy piles

As requested by the City of Vantaa, the Vaaralanpuisto day-care centre has been planned based on the "nearly 0 energy days" concept. Construction work for the day-care centre began in late summer 2016, and the project will be completed in July 2017. Project costs are estimated at EUR 5.4 million, and the day-care centre will accommodate about 130 children. Among the various energy production options available for the site, the City of Vantaa chose the energy pile and solar thermal collector system jointly developed by Uponor and Ruukki.
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Project Facts:

Location

Vantaa, Finland

Completion

2017

Building Type

Office building

Product systems

Radiant Heating & Cooling, Local Heat Distribution, Ground Energy, Heating and cooling

Project Type

New building

Partners

Fitter: RST Asennuspalvelu Oy
Construction company: Rakennus Future Oy

Energy piles as structural elements

District heating was the first option presented during the project planning phase. The costs for connection to the district heating network became too high, especially due to the construction of connection pipes. Therefore, a set of new options had to be weighed.

The survey carried out to determine the foundation method showed that piles were the way to go. Therefore, the use of energy piles was justified.

-As per the "zero energy" concept, the use of renewable energy was one of the basic promises. In the end, we opted for the energy pile system on the basis of the case examples and presentations of the Ruukki-Uponor cooperation. The system is equipped with solar thermal collectors as well as energy panels for additional energy production, says project manager Tapani Torppa from the City of Vantaa.

Energy piles serve as both structural load-bearing piles and geothermal heat collectors. There are a total of about 70 piles, 50 of which are energy piles. The piles were driven all the way to the bedrock, i.e. to a depth of 15 to 20 metres. No bedrock drilling was required as the calculations and energy simulation showed that the energy piles, energy collectors, panels and solar energy recovery system were adequate sources of heat and electricity. In summer, solar thermal collectors are used to store heat in the ground in order for the system to function as planned in winter. Uponor's and Ruukki's own experts as well as university experts have been used in energy simulations and in the planning and calculation of energy needs.

Uponor heavily involved in project implementation

Uponor will install the energy collection pipes to the steel piles delivered by Ruukki, as well as the solar thermal collectors. It will also plan and install the heat pump. The site's heat distribution system will be Uponor's underfloor heating.

-This kind of expertise is available nowhere else in Finland, which is why Uponor monitors the implementation. The aim is to plan and build an optimal solution based on our "nearly 0 energy days" concept. Furthermore, after completion of the site, Uponor will train the personnel responsible for the technical maintenance and use of the City of Vantaa's properties, in order for the energy systems to function optimally as planned, emphasises project manager Tapani Torppa from the City of Vantaa.

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