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Utilization of geothermal energy in Mezőberény, using Uponor pre-insulated pipeline system



Uponor engasjement

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Energy-conscious solution With regards to natural gas market price changes and environment awareness Municipality of Mezőberény decided to submit tender under Environment and Energy Operational Programme in order to replace their natural gas based heating system in their public institutions with heat distribution system based on thermal water.

Prosjektfakta

Location
Mezőberény, Hungary

Ferdigstilt
2012

Bygningstype
Kommunalt område

Product systems
Kulvert-system

Prosjekttype
Ny bygning

Partnere

installer
Aquaplus Kft

investor
Mezőberényi Önkormányzat

The basis of the heat distribution system is the approx. 85 to 90 °C hot thermal water available in Mezőberény to supply heat and hot water demand so as to replace natural gas consumption in public institutions as much as possible. The Contractor Aquaplus Kft. chose Uponor's pre-insulated pipeline.

Base data and system design:

A pre-condition for geothermal energy utilization is to exploit water of appropriate volume and temperature. When exploitability of geothermal water meets heat demand, geothermal water of appropriate volume and temperature can be gained by properly bored and deep geothermal borehole. In Mezőberény thermal water borehole data providing the geothermal-based demand of the public institutions heat distribution system are: Denomination: T-1 Base depth: 2,003.0 m Operating water capacity 30 m3/h Operating water temperature: 88.9 °C

System operation principle:

Thermal water is pumped from borehole T-1 by a submersible borehole pump via DN 80 series of fittings and connecting pipelines installed according to MSZ 22116 standard into the storage located close to the borehole with GMT type degassing equipment. The volume of the storage tank is 50 m3 from where buffered water flows by gravity to the pressure booster pumps. Depending on the current heat demand of the public institution thermal water is supplied by the pressure booster pumps into the double pipeline network via 3 rough screens.

Treated thermal water pumped into the system is basically used in two stages:

- Thermal heat distribution: local heat supply of directly connected institutions via thermal pipelines. - Secondary heat distribution: heat energy of the thermal water is transferred by central heat exchanger in the local distribution centres and it is transported in double pipeline closed-loop pressurized system to the heat centres of the utilization points.

Secondary heat distribution system supplies heat energy via PN6 Uponor Ecoflex Thermo Single and Twin flexible, pre-insulated pipelines that can be directly embedded in the ground and has a maximum of 95 °C operational temperature.

- Dormitory of Petőfi Sándor High School buildings "A+B" and kitchen - Statutory undertaker's office building and workshop - Old people's home in Juhász Gyula Street - Mayor's Office - Old people's Club - Town Museum

Secondary heat distribution system operates at the following heat stages: Thermal water heat stage: 80/50 °C Heat distribution temperature step: 75/48 °C Gas boilers heating temperature step: 80/60 °C Thermal heat distribution system outside the building: Thermal water is transferred to the below users via PN6 Uponor Ecoflex Thermo Single and Twin flexible, pre-insulated pipelines (up to DN110 pipe size) that can be directly embedded in the ground and has a maximum of 95 °C operational temperature.

Institutions directly supplied by thermal energy:

- Engine compartment, heat distribution centre - Dormitory of Petőfi Sándor High School, building "C" - Dormitory and Mezőberény Primary and Secondary School and Technics classroom - Family Support Service - Joint boiler room of Mezőberény Primary and Secondary School and Petőfi Sándor High School - Old people's home in Puskin Street - Cultural centre and library - Mezőberény Primary and Secondary School, building in Luther Square - Day Nurseries, Kindergarten and Kindergarten Administration

Return thermal water from central heat exchanger of the secondary heat distribution system and return thermal water from the thermal centre of the direct thermal system is transferred via joint pipeline to the mechanical injection unit of the water base. Injection pipeline is of uninsluated D110 Uponor Pe-Xa pipe. Water is transferred via the pipe to the injection

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