HakaGerodur

Image source: GEOTHERM AG, Düdingen

Project report

GEROtherm® DUPLEX & VARIO geothermal probes

Terraced houses, Embassy District, Bern


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A drilling rig suspended high above the roofs of Bern

In Bern, tradition meets innovation. Three historic terraced houses have been equipped with geothermal probes. The developers opted to replace the old gas heating systems with environmentally friendly heat pumps in order to reduce energy costs and contribute to sustainability.

Three geothermal probes at a depth of 170 metres each were planned for the first building. Since no deep boreholes had been drilled in the immediate vicinity, the feasibility study – based on the cantonal geoportal model –assumed that the uppermost rock layer would be encountered at a depth of 100 metres. Fluvial deposits in the glacial foreland, heavily saturated with groundwater, significantly hampered drilling progress due to substantial uplift pressure.


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After two days of laying pipes in the moraine deposition of the last Ice Age, everyone was greatly relieved when sandstone was finally encountered at 164 metres below ground level. It was only thanks to a powerful suite of machines, unconditional dedication on the part of the employees, the equipment driver's considerable expertise, and a lot of patience that it was possible to reach this depth of rock at all.

After the geothermal probes for the first building were successfully positioned, the entire drilling installation in the backyard was relocated to the neighbouring plot that had been prepared by the landscape gardener. Rotary drilling using compressed air as the flushing medium was chosen as the drilling method. The amount of available space in the garden was too limited to use a traditional clay-based drilling system.

In order to raise the drilling equipment from the garden again after completion of the boreholes, the entire Reinmattstrasse was blocked off again for all traffic. The 16-tonne drilling rig was lifted over the roofs of Bern using an extendible lorry-mounted crane. After four weeks of intensive and challenging work, the geothermal probes were successfully installed and the terraced houses were ready to be heated in an environmentally friendly manner.

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Three GEROtherm® DUPLEX probes of 170 metres each and two GEROtherm® VARIO probes of 300 metres each were used for the probe field. Pressure loss in the conical, pressure optimised GEROtherm® VARIO geothermal probes is significantly reduced in comparison with a corresponding PN20 geothermal probe, resulting in lower energy requirements for the circulation pump.

Image sources: GEOTHERM AG, Düdingen

1. The crane positioned the drilling rig in the garden.
2. The entire Reinmattstrasse had to be blocked for all traffic.
3. The Geotec Rotomax XL GTKi drilling rig was set up in the garden.
4. Drill rods and piping ready for use.
5. There was very little space, but it was still enough.
6. The lorry-mounted crane was supplied by Zaugg from Rohrbach; it was a Growe GMK 5180 with a total weight of 160 tonnes, including ballast.

Project details

Construction site

Terraced houses
Reinmattstrasse
3011 Bern

Drilling company

GEOTHERM AG
Birchstrasse 20
3186 Düdingen
https://www.geotherm.ch/

Crane work

Zaugg AG Rohrbach
Walke 2
4938 Rohrbach
https://www.zaugg-rohrbach.ch/

Heating company

WPC WärmepumpenCenter AG
Mr René Steiner
Rubigenstrasse 79
3076 Worb
https://www.wpcenter.ch

Products used

- Three GEROtherm® VARIO geothermal probes, de 40 × 3.7 mm, PN16, length 170 metres
- Three GEROtherm® grouting tubes, PE-HD, 32 × 3.0 mm, length 172 metres, S5 SDR11, with grey marking strips
- Two GEROtherm® VARIO geothermal probes, de 40 × 3.7 – 4.5 mm, PN16 to PN20, length 300 metres
- Two GEROtherm® grouting tubes, PE-HD, 32 × 3.0 mm, length 302 metres, S5 SDR11, with grey marking strips

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