HakaGerodur

Source: HakaGerodur

Site report

GEROtherm® VARIO – geothermal probes with a conical design
GEROtherm® SAVE 125 – collectors and distributors

Swiss Embassy
Rome

Introduction

The Swiss Embassy complex in Italy is located in the heart of Rome, surrounded by ancient villas. The complex comprises three buildings: the residence building, the consulate and the gatehouse.

A field of geothermal probes is being built as part of the project to restructure and improve energy efficiency. The closed circuit incorporates vertical heat exchangers and horizontal connections, as well as collectors and distributors.

Image 1: The residence building of the embassy
Source: HakaGerodur

The plan for the geothermal probes

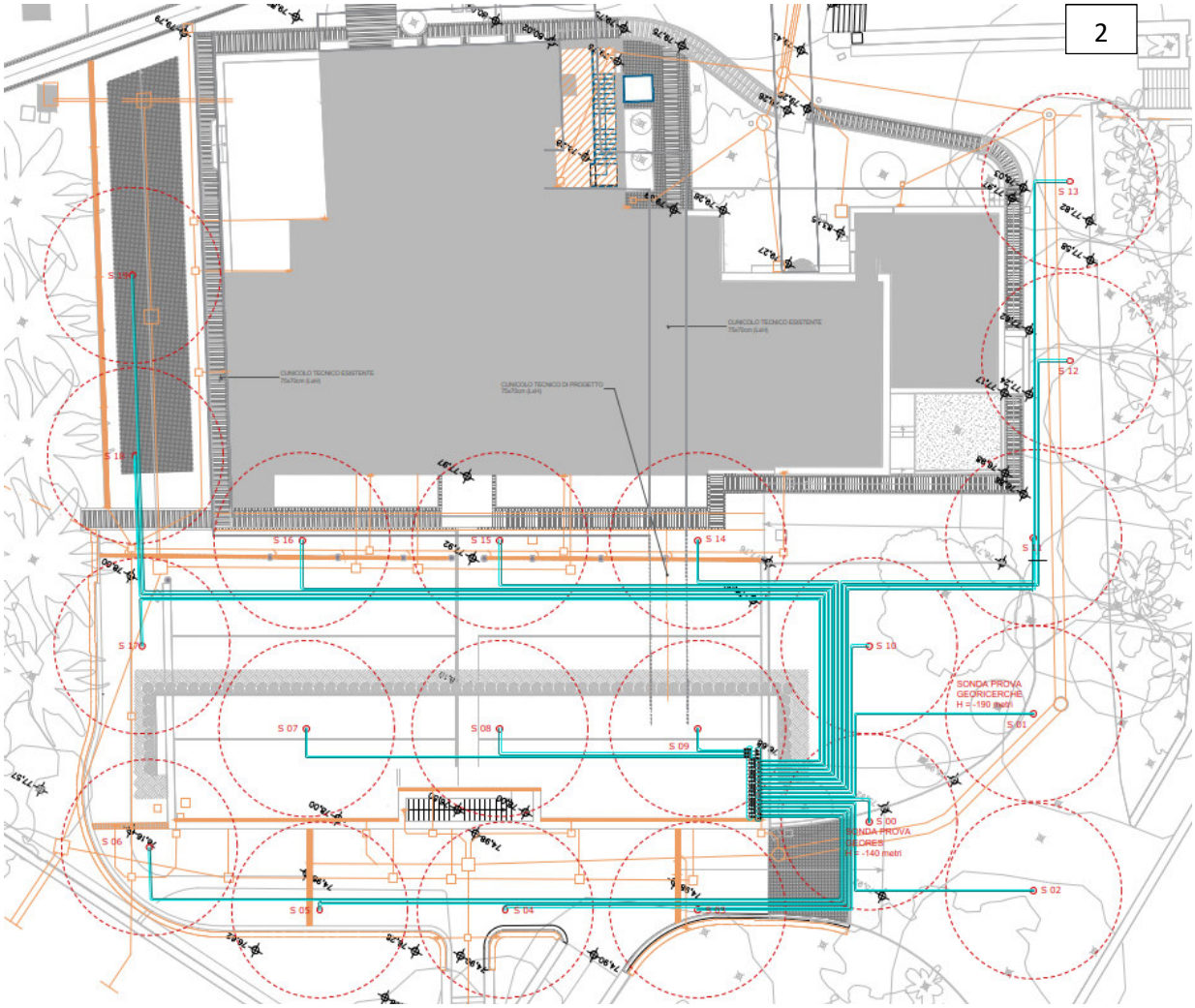
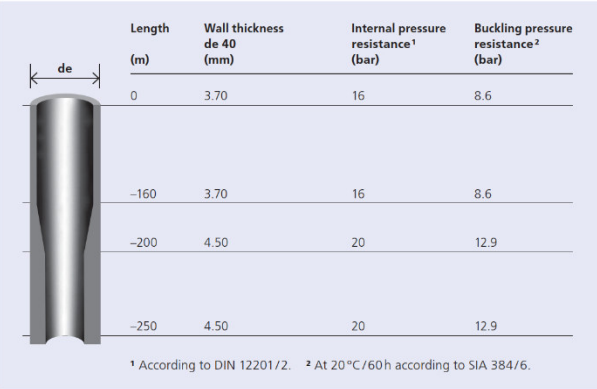


Image 2: Embassy construction plan with the originally planned 20 geothermal probes
Source: M.R. Progetto Impianti Rom

GEROtherm® VARIO conical geothermal probes

The GEROtherm® VARIO de 40 x 190 m geothermal probes used, which are manufactured from PE100-RC, feature a conical design and have been optimised for pressure. They therefore offer safety and increased energy efficiency. The wall thickness varies from 3.70–4.30 mm, which means that the internal pressure resistance is 16–19 bar depending on the depth. The VARIO probe in de 40 is available up to a length of 250 m.



Length (m)	Wall thickness de 40 (mm)	Internal pressure resistance[1] (bar)	Buckling pressure resistance[2] (bar)
0	3.70	16	8.6
–160	3.70	16	8.6
–200	4.50	20	12.9
–250	4.50	20	12.9

[1] According to DIN 12201/2. [2] At 20 °C/60 h according to SIA 384/6.

Image 3: Wall thickness distribution and pressure resistance

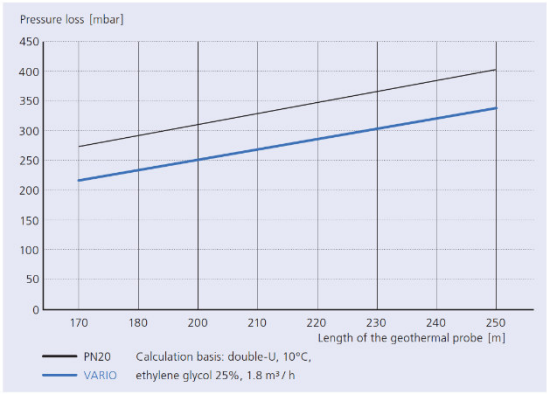


Image 4: Comparison of pressure loss VARIO de 40 versus PN20

The probe is patented (EP 2 706 308) and certified by the German Plastics Centre SKZ (certificate no. A278). The optimised hydraulic pressure loss therefore enables more efficient overall systems.

The GEROtherm® PUSH-FIX installation aid

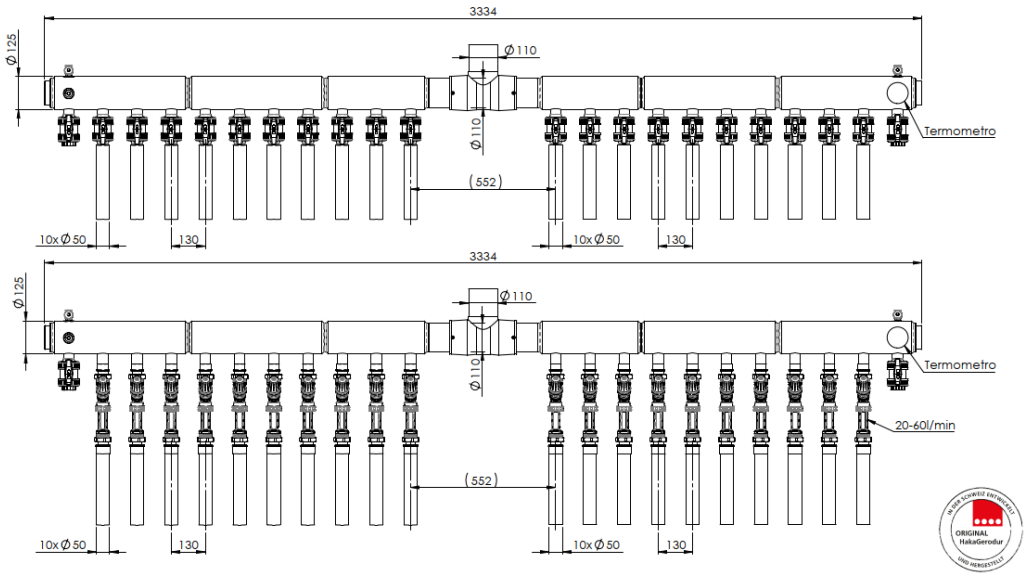
The experienced drilling company Georicerche srl was responsible for installing the probes. The GEROtherm® PUSH-FIX impact-resistant sleeves were used to facilitate the sinking.

Image 5: VARIO probe with PUSH-FIX installation aid
Source: Georicerche Srl

Image 6: The Comacchio GEO 700GT drilling rig
Source: Georicerche Srl

GEROtherm® SAVE125 collectors and distributors

Twenty geothermal probes, each with a length of 190 m, were originally planned. Due to the challenging geological conditions, it was not possible to drill a probe to the depth of 190 m, which made it necessary to drill another borehole. The system consists of a total of 21 probes. The four GEROtherm® SAVE125 (two collectors each with Hyline balancing valves and two distributors with ball valves) were installed in a T-shape. This allowed the free filling and drainage valve to be used for an additional connection of a geothermal probe.



Project data

Construction site
Swiss Embassy
Via Barnaba Oriani, 61
IT – Rome

Drilling company
Georicerche Srl
Via Veneto, 40
IT – Due Carrare

Client
Swiss Confederation Federal Office for Buildings and Logistics FBL, CH – Bern

Civil engineering firm
sAs
società di analisi strutturale – progettazione strutturale

HVAC planning
M.R. Progetto Impianti
Via G. Ricci Curbastro, 29
IT – Rome

Architect
Acta Architettura

Products used

- 21 GEROtherm® VARIO geothermal probes PE100-RC, PN 16–19, de 40 mm, length 190 m
- 21 GEROtherm® grouting tubes
- 21 GEROtherm® PUSH-FIX impact-resistant sleeves
- 4 GEROtherm® SAVE 125 in T-shape including mounting set

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