



Image source: arquitectos Fuster / PROA

Project report

GEROthem[®] DUPLEX geothermal probes

Renovation of music conservatory
Nuevo conservatorio profesional de música
SP-Zamora

Zamora is the capital of the province of the same name and the main town of a municipality of 60,000 inhabitants in the autonomous Spanish region of Castilla y León. The town is located

on the River Duero, and a new music conservatory is being built there. The primary purpose of the Professional Conservatory of Music is to provide students with an appropriate environment to further

their artistic training. The new building will be erected on the site of the former Universidad Laboral. The existing old theatre will be transformed into a modern and energy-efficient auditorium.

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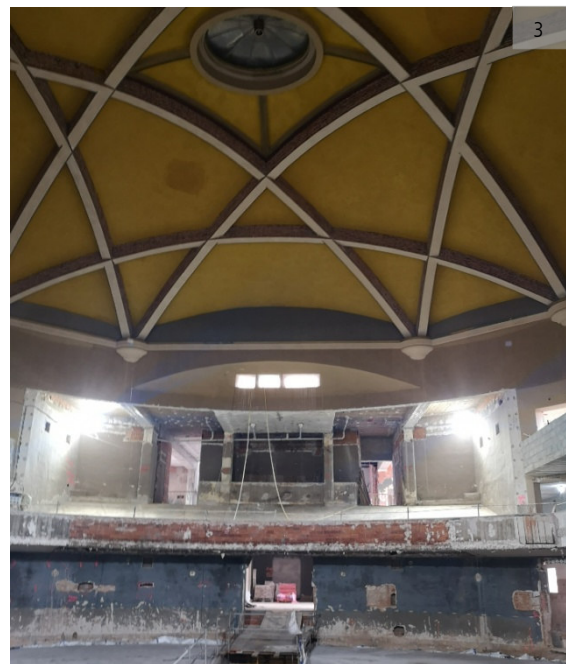


Image 1: New building and old theatre / Source: Fuster arquitectos



2

Image 2: Aerial perspective / Source: El día de Zamora



3

Image 3: The theatre under reconstruction / Source: HakaGerodur

Image 4: Underground car park under the building / Source:



4

A multi-storey car park is also being constructed under the new building. Investments totalling 17 million euros have been provided for the renovation and conversion work. Construction began in June 2022. After a planned construction period of 36 months, the new buildings are scheduled to be ready for occupancy in July 2025.

Temperatures of 21 to 24 °C are specified in the rooms, and the humidity is to be 50%. These parameters are achieved by underfloor heating and fan coils in combination with two heat pumps. Geoter from San Sebastian is responsible for the installation of the geothermal system with GEROtherm® DUPLEX geothermal probes. The connection lines and distributors were installed by Geoter technicians, but the installation presented the fitters with major challenges. In the underground car park area in particular, the connecting cables had to be installed under difficult conditions. Due to the high groundwater level of the River Duero, the trenches with the pipes were regularly flooded with water.

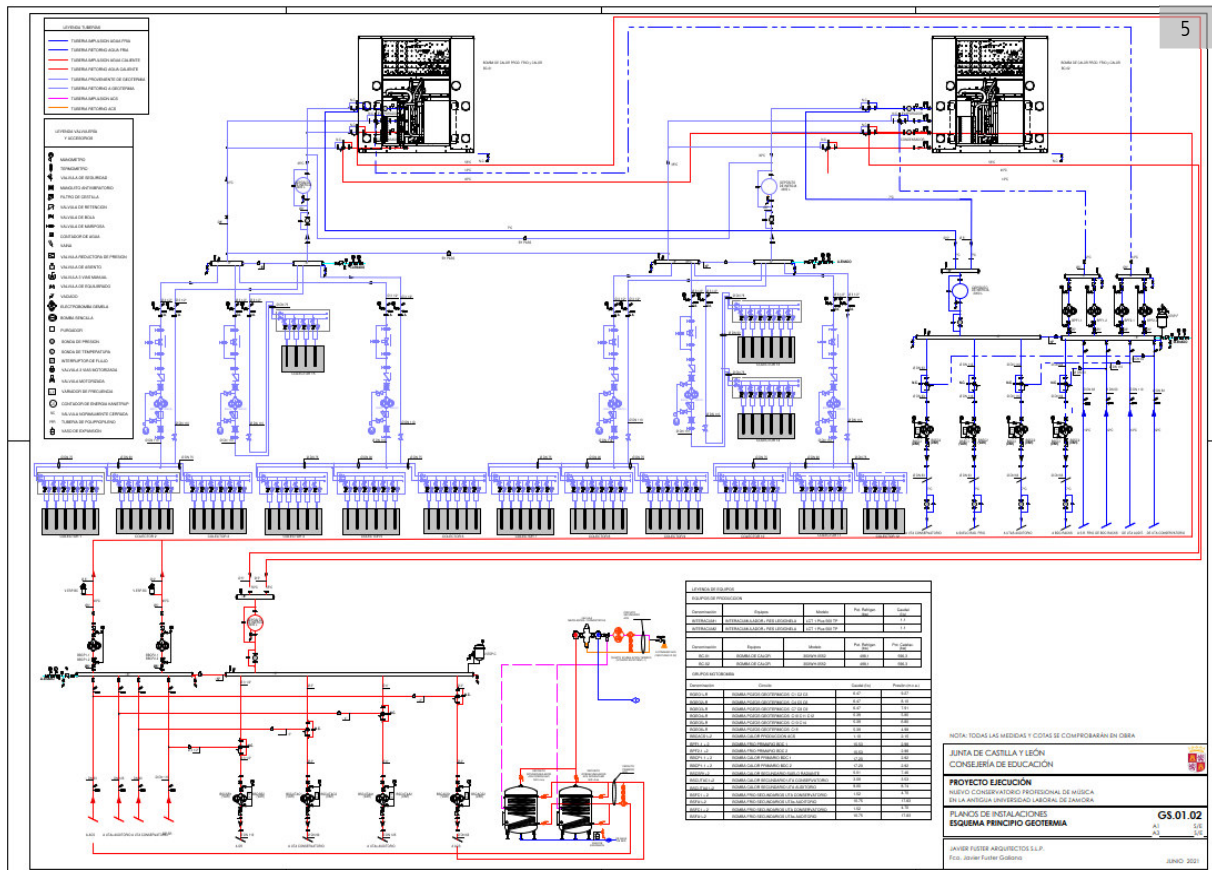


Image 5: Schematic of the geothermal system
Source: Fuster arquitectos

The thermal response test was carried out by A&P Geotermia and resulted in values of 3.45 W/m K and an Rb rating of 0.086 W/m K. The ground temperature is 16.3 °C. Originally, 80 double-U probes of outer diameter (OD) de 32 x length 150 m were planned. Due to the difficult subsoil, it was only possible to drill to a depth of 140 m in some places. The decision was then made to drill 15 additional probes of OD de 32 x length 140 m. In some cases, two Comacchio MC900P drilling rigs were used simultaneously for the drilling work.



Image 6: Drilling work with Comacchio MC900P
Source: HakaGerodur

Project details

Construction site

Music Conservatory
ES-Zamora

Client

Junta de Castilla y Leon

Architect

Javier Fuster Arquitectos S.L.P.
Calle Lagasca 91
ES-Madrid

Drilling company

Geoter
ES-San Sebastian de los Reyes

HVAC planning and construction management

Geoter Geothermal Energy S.L.
Avda. de los Pirineos, 9
ES-San Sebastián de los Reyes

Geology

A&P Geoterma
Auditorías y Proyectos Geotérmicos
Tierra de Soria, 3
ES-Valladolid

Products used

- 80x GEROtherm® DUPLEX geothermal probes, PE100-RC, PN16, OD 32 mm x length 150 m
- 15x GEROtherm® DUPLEX geothermal probes, PE100-RC, PN16, OD 32 mm x length 140 m



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