Golder was responsible for the design of technological systems as part of the global renovation project of the historical building named "Maison Lostan" located in the centre of Aosta city, in the north of Italy.

Golder used an integrated approach in the design of a low enthalpy geothermal system, studying together ground and heat engineering system.

Golder designed a closed loop geothermal system based on ground boreholes heat exchangers for the heat and cool supply to the building during the whole year using a heat pump system.

The geothermal system comprises 440 kWt thermal capacity heat pumps with high coefficient of performance (COP= 4 in heating and EER= 6 in cooling).

The system uses 34, 200 m deep, ground boreholes heat exchangers (BHEs), divided in three fields:

- C1: 15 BHEs
- C2: 13 BHEs
- C3: 6 BHEs

Golder carried on the detailed design of all the technological system of the building including:

- heating, ventilation, air conditioning systems (HVAC);
- water, sanitary and fire-fighting systems;
- electrical installations.

As part of the Golder service, it has been made an energy simulation of the thermal behaviour of the ground and heat pump system. Feflow® software was used to build a 3d transport heat model in order to:

- verify if the BHEs were correctly designed;
- check if the system would affect the soil temperature around the BHEs;
- model the heat plume within the aquifer.

Conditioned floor area = 2.800 m$^2$
Total conditioned volume = 7.500 m$^3$
Public area = 4.000 m$^2$
Building use = offices and exhibitions areas
Cost of technological systems = 3.100.000 €
Total cost of the project = 12.000.000 €