



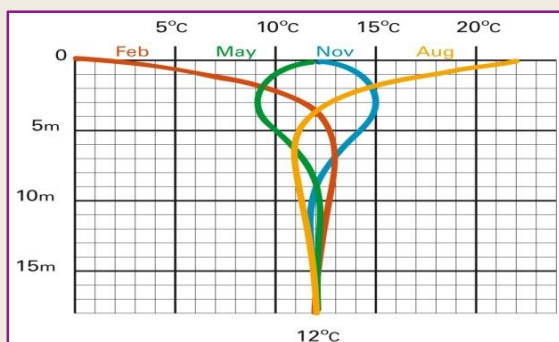
GEOHERMAL DRIVEN PILES

Geothermal piles offer a sustainable, low-cost method of heating and cooling houses, offices or commercial and industrial buildings. Carbon footprint savings are made on new developments helping clients meet legislation on sustainable development.

BASIC TECHNIQUE

Driven Precast Concrete or Steel Tube Geothermal Piles are installed in much the same way as conventional driven piles, but with geothermal loops attached. The loops are used to take the heat energy out of the ground by means of a special solution which is pumped through the pipes. This transfers the energy from the soil to a heat exchanger at the surface, which then amplifies the temperature difference (in a similar way to a fridge), which can then heat or cool the building via a standard central heating system.

The temperature of soil and groundwater remains at a fairly constant temperature of about 12°C below about 8m depth, as seen in the graph below.



GROUND TEMPERATURE FLUCTUATION WITH DEPTH

WHERE CAN THEY BE USED?

Driven Geothermal Piles generally obtain the best results from locations where soft or loose soils are present to great depth and where the groundwater table is high.

INSTALLATION

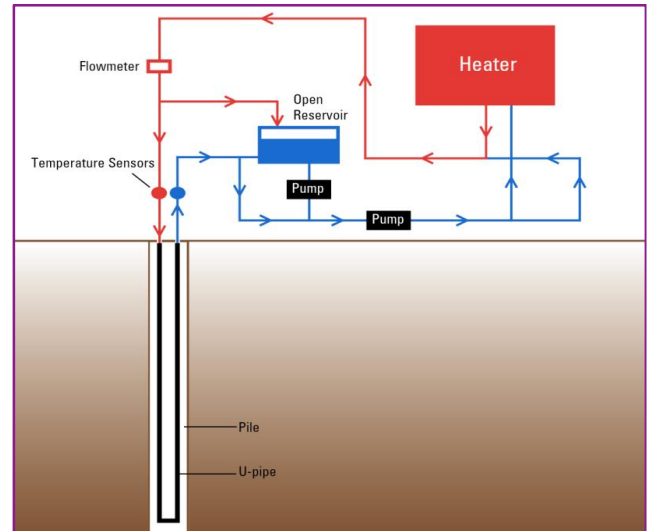
BBGE will provide and install co-axial piping and the manifold connections to the head of each pile leaving infrastructure connection to be completed by the main contractor.

Geothermal piles cause the least disturbance to the substructure works when they are non-load bearing and installed in land around the structure such as below car parks or landscaped areas. Load bearing energy piles require careful design to ensure ground-temperature balance, plus integration with the follow-on construction works.

If required, a design and installation service for pipework and heat exchange systems can be provided by BBGE, working in conjunction with a geothermal design and installation contractor.



GEOHERMAL SYSTEM INSTALLED ON PRECAST PILE



HOW THE SYSTEM WORKS

ASSESSING HEAT ENERGY FOR YOUR BUILDING

Most energy pile installations will achieve at least 30 watts of heating and cooling energy per metre depth of soils. One kilowatt of energy (one 33m deep precast pile) is enough to heat and cool a well-insulated 4m by 4m room. A typical two storey office arrangement for twenty people, if constructed to modern insulation standards, would typically require around 50kW of energy from a ground source loop.

RETURN ON INVESTMENT

We estimate on projects where piling is required to support the building anyway and where conditions are suitable, that the extra cost of the geothermal installation can be recouped within 5-10 years.

MEASURING THE HEAT CAPACITY OF YOUR SITE

A standard Thermal Response Test (TRT) can be carried out on any proposed site to measure the heating or cooling energy available from the ground (measured in W/m/K). The test is carried out using a self-contained portable unit towed behind a 4x4 vehicle.

A properly conducted test takes 3 to 4 days to complete, with results available within 2 weeks. This information is required to optimise the geothermal pile design. If the TRT is not carried out, a preliminary geothermal design can still be implemented using published information about the thermal conductivity of various ground conditions.



PRECAST PILE INSTALLATION



GEOHERMAL LOOP PRESSURE TESTING

CONTACT US

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