

GeoDrilling International



Borehole logging

Every hole is drilled for a reason, and frequently that reason is so that the ground's geology can be examined through borehole logging

Training

From new entrants to seasoned drilling professionals, everyone in the drilling industry can benefit from technique-specific training

Ground source heating

Potentially low-cost, carbon-free and ultimately limitless, the potential for ground source heating continues to grow and develop



Preserving heritage while drilling deep

How a unique drilling project brought together 21st-century technology and centuries-old architecture in the heart of Oxford when a Comacchio GEO 909 GT rig was used to deliver an ambitious ground source heat pump system at Trinity College

A unique geothermal drilling project recently brought together 21st-century technology and centuries-old architecture in the heart of Oxford, UK. As part of a wider decarbonisation initiative, Trinity College turned to leading renewable installer Rendesco and its trusted Comacchio GEO 909 GT drill rig to deliver an ambitious ground source heat pump (GSHP) system, reducing the historical site's carbon emissions while preserving its architectural legacy.



A Comacchio GEO 909 GT drill rig and An Elgin mud recycling system were employed by Rendesco for the creation of boreholes for a ground source heating project at Oxford's Trinity College

SUSTAINABLE RETROFIT

The Jackson Building at Trinity College, a Grade II-listed structure that houses student accommodation and communal spaces, is undergoing a deep retrofit. The project replaces outdated gas boilers with a vertical borehole GSHP system designed to reduce carbon emissions by approximately 115 t of CO₂ annually – roughly 12% of the College's total footprint.

The location presented a series of complex challenges. Situated in central Oxford, surrounded by narrow medieval streets, formal gardens, and protected architecture, the project demanded an approach that was both technically precise and environmentally sensitive.

22 BOREHOLES, 166M DEEP

Rendesco's design specified 22 boreholes, each reaching a depth of 166m, to install 40mm heat collector loops. Boreholes were formed at ~150mm diameter, grouted to seal and protect groundwater conditions. A key consideration was the presence of artesian water in the limestone

aquifer beneath the Oxford Clay. "Working in central Oxford, surrounded by historic buildings, it was imperative that artesian water was contained properly, and the site left in pristine condition," Tom Page, managing director of Design & Build at Rendesco, said.

Rendesco's drilling team developed a method statement involving recycled mud flush, weighted specifically to contain and control the artesian flow during drilling.

A RIG BUILT FOR THE JOB

The Comacchio GEO 909 GT was selected for its advanced geothermal drilling features. Its double-head system enables simultaneous drilling and casing, ensuring a consistent seal and effective containment of both recycled drilling fluids and artesian water.

The rig's patented rod and casing carousel, with a 128m tooling capacity and a fully automated feed mechanism, minimised manual handling and shortened the drilling cycle. "This setup reduced manual handling, limited the movements required

by telehandlers (thus reducing disturbance onsite) and ensured that the drilling process was fast and efficient, minimised collapse risk, and limited the time that the artesian boreholes remained open before grouting," Page explained.

An Elgin mud recycling system complemented the rig, improving fluid management, maintaining site cleanliness, and reducing environmental impact.

PRESERVATION

Despite restricted access and the need to protect heritage features, Rendesco achieved a high productivity rate, completing each borehole, including casing to 60m and open hole to 166m, within just two days. The team averaged 2.5 to 3 boreholes per week.

"Drilling in such a sensitive location requires not just the right technology, but the right people," added Tom Page. "The GEO 909 GT is best-in-class when casing is needed. And with ongoing support from JKS Boyles, we continue to deliver low-impact, high-efficiency GSHP systems that help institutions move away from fossil fuels." ▼

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