

GeoDrilling

INTERNATIONAL

- Ground-source drilling
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- Piling and foundations

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Drilling and Foundation Equipment



► the harbour. There is also a manually operated stop-log crane at the end of the South West pier.

It was decided that remedial works be carried out to stop further deterioration of the piers, and provide quicker and safer handling of the stop logs. This comprised:

- A survey of the stop logs and channels;
- Re-pointing of the joints between the masonry blocks for a 10m length from the pier roundheads;
- Grouting the wall core to fill any possible voids; and
- Replacing the concrete foundations for the stop-log crane.

The order of the works was governed, to some degree, by the tides, but Van Elle was able to manage the project around this, ensuring all of the works were completed on schedule.



approximately 1m below ground level. According to the soil conditions, compact piles were chosen for the building's foundations. The project will require the execution of 40km of 600mm-diameter displacement piles, ranging from 17-24m in length.

Compared to classical CFA piles, the compact pile (or displacement pile) is executed without any soil extraction, using a special tool mounted at the tip of a flightless drilling-rod string. The tool consists of two main sections, allowing simultaneous drilling and compaction.

In practice, the soil is excavated from the centre flight by the tool-drilling section, and then displaced and compacted laterally against the walls of the hole by the compacting section. The piles are concreted during drill-rod lifting while rotating clockwise.

Tools are chosen in accordance with the ground conditions and can be cylindrical or conical, with either long or short drilling and compacting sections.

At the Monselice project the piles also



act as geothermal wells. After concreting, a geothermal loop is installed inside the reinforced cage and then pushed into the concrete. Thermal exchange between the surrounding soil and the concrete piles is enabled by the watertable being located immediately below ground level.

Concrete rings are then placed on top of the piles to compensate for the height difference between the ground and slab level.

Soilmec supplied an SR 80 multi-purpose rig to carry out the piling work and each hole takes 7-8min on average to drill. However, the concreting and installation of the reinforcement cage with the geothermal loop requires up to 30min for execution.

Daily production, including rig tracking between piles, reaches around 16 pile per day, which, with an average pile depth of 20m, equates to around 320m per day per unit of drilling.

With such production rates, the €165 million project is scheduled to be completed on time, and the new hospital should offer one of the most modern and thermally efficient medical facilities in the country. ▼

Above: concept drawing of the new hospital

Top left: geothermal loops are prepared for installation in the piles at Monselice

Soilmec

Soilmec recently supplied drilling equipment for piling work at a new hospital, near Monselice in the Veneto region of Italy.

With a population of 18,000, Monselice is located at the southeast border of the Euganean Hills. The area has a typical, volcanic cone landscape with substantial geothermal activity.

The 'Nuovo Polo ospedaliero unico' (new single pole hospital) will provide more than 600 beds. It will also be fitted with thermally insulated walls, mobile solar shield facades, natural ventilation, geothermal heat pumps, and have photocatalytic paint on the walls and floors to maximise energy efficiency.

The geology of the site is characterised by the presence of fine sand and silts, silt clay and fine-to-medium density sand (STP up to 45 blows), with the watertable

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