



TECHNOLOGY

Trelicon

Continuous flight auger piles





Absence of drilling slurry

**Admitted diameters
400 mm to 1,400 mm**

**Maximum pile depth
35-40 m fully reinforced**

**No vibrations or impulses
during constructions**

High productivity



The piles realized using the Trelicon technology have the advantages of driven piles and the application versatility of drilled piles.

*Moreover, a wide range of diameters and lengths can be obtained. **Indeed it is possible to drill piles of a diameter from 40 to 140 cm. In terms of length, the equipment currently available allows to reach 35 ÷ 40 metres (with loader), depending on pile diameter and soil consistency.***

The drilling method allows to cross a wide range of cohesive and non-cohesive soils, both in the presence and absence of aquifer. Any cobbles compatible with the auger diameter are easily displaced thanks to the power of the rotary heads.

Moreover, no shocks or vibrations are produced and it is therefore possible to work in town centres.

Technology

The Trelicon operating sequence includes the following steps:

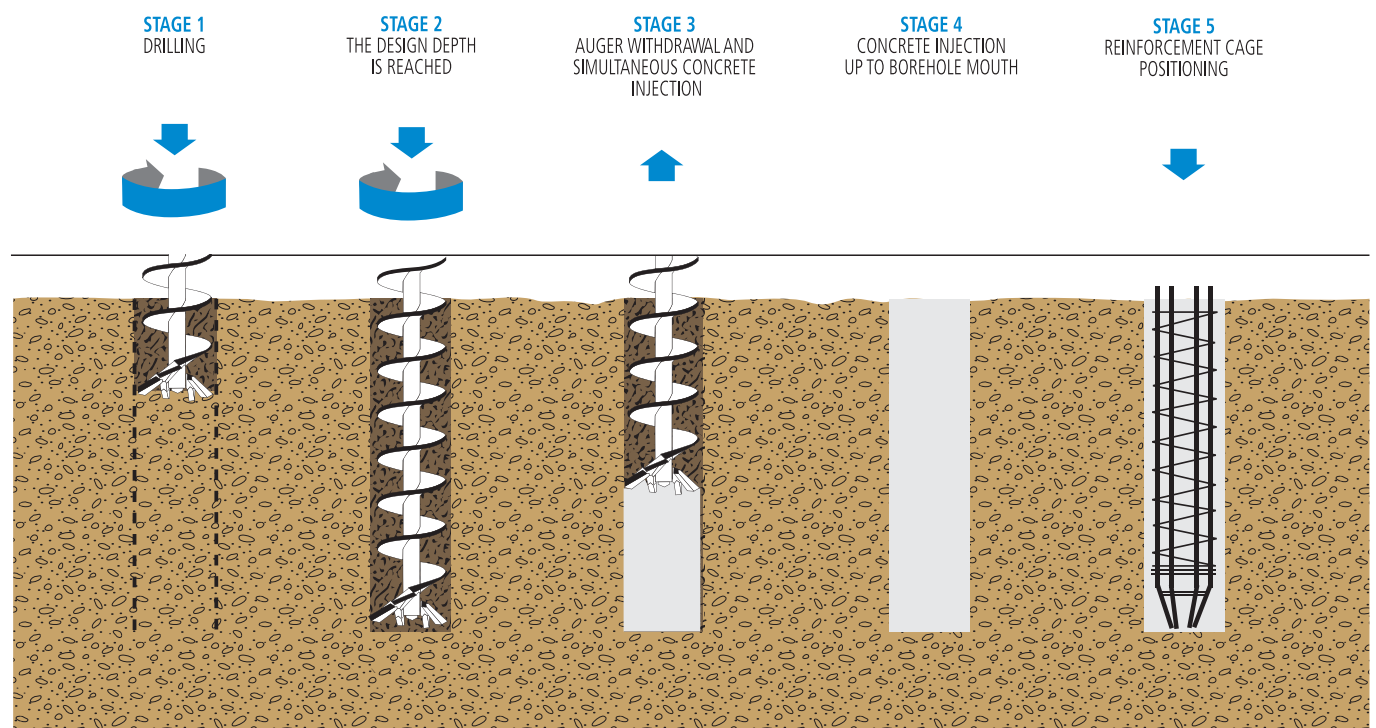
- **rotary driving of the continuous flight auger** connected to the rotary head to the design depth;
- **withdrawal of the auger string and simultaneous concreting**, through the drilling string;
- **positioning of the reinforcement cage** through the fresh concrete injected up to the ground level.

To ensure the fast positioning of the cage into fresh concrete, the latter should have the following features:

- aggregates with a diameter of max 18 mm shall be used;
- S5 or SCC slump classes shall be used. When using S5 concrete (slump > 220 mm), the max cage positioning depth is usually 12-15 m, whereas when using SCC it is possible to apply reinforcement cages to piles as long as 35-40 m.

Pile concreting is carried out by means of a tracked concrete pump with an output ranging from 80 to 120 m³/h.

The reinforcement cages for Trelicon piles must be assembled respecting a number of principles: the bottom part must be conic-shaped to facilitate driving and hole centring, whereas the cage body must be strengthened with bars of suitable diameter. The concrete cover must be at least 7.5 cm.



Tools



The drilling tool is made up of a continuous flight auger consisting of a string of auger elements of various lengths – 1.5 to 6 m – with a hollow pipe through which concrete is pumped.

Auger **diameters** can range from **400 to 1400 mm**, whereas the hollow centre is 4" (100 mm) in 400÷700 mm-diameter augers, and 5" (125 mm) in 800÷1400 mm-diameter augers.

The drilling tools are selected according to the type of soil. In case of loose granular soils, special attention should be paid to avoid overbreak.

For safety reasons, all drilling tools are fitted with an auger cleaner fixed to the mast of the drilling rig, and inside which the auger is operated.

During extraction, the cleaner removes the cuttings attached to the auger flights.

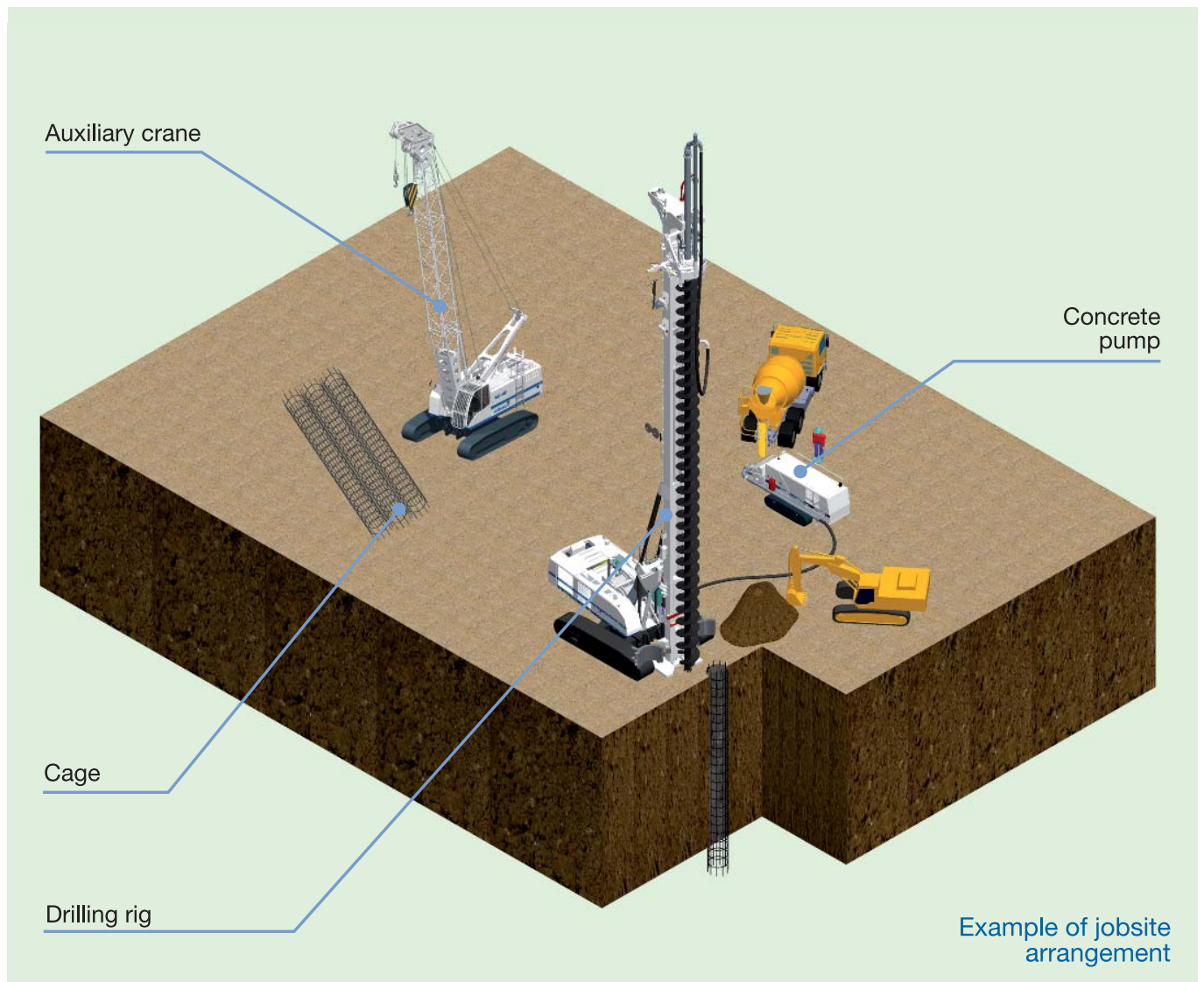


Equipment and Jobsite logistics

The main drilling equipment adopted by Trevi for this technology is the following:

- Soilmec SR-100,
- Soilmec SR-90,
- Soilmec SR-80,
- Soilmec CM-120,
- Soilmec R-825,
- Soilmec R-622.

For the construction of Trelicon piles, the jobsite has to include a drilling rig, a small-sized tracked hydraulic pump, a backhoe excavator for debris handling and an auxiliary crane for cage positioning, whether needed.

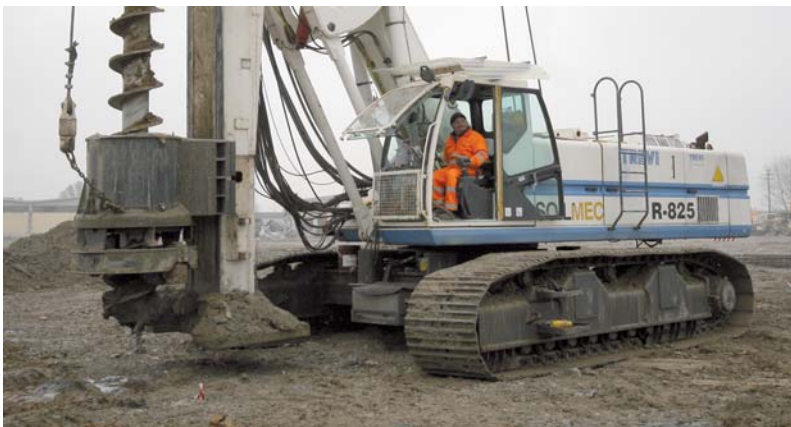


Technology advantages



The main advantages of the TRELICON technology are listed below:

- **No drilling slurry is used:** the debris has the same environmental features of soil in-situ before drilling.
- **No vibrations or impulses** typical of percussion systems.
- **No trenches or open-cut excavation** resulting in soil decompression. This technology is especially suitable for the construction of diaphragm walls next to existing buildings and structures.
- **No cumbersome mixing and desanding plants** that are on the contrary needed for the construction of standard diaphragm walls or when working with a hydromill.
- **Doubled operating speed**, under the same geological conditions, with respect to standard Kelly method.



The absence of soil decompression during pile construction makes it possible to work in the proximity of existing structures. Moreover, as no drilling slurries are used (bentonite or polymer), the size of the jobsite installation is reduced and the problems of cuttings disposal are minimized, as they are not contaminated by slurry.

As the technology does not involve soil decompression, the bearing capacity of a Trelicon pile is higher than any equivalent drilled pile.





World leader in ground engineering, Trevi has been working for more than 50 years throughout the world, strengthening its ability to provide solutions to any ground engineering issues. Trevi works in the field of special foundation, soil consolidation, dam remedial works, tunnel construction and consolidation, marine works, rehabilitation and cleanup of contaminated sites and construction of underground automatic multi-storey car parks. Trevi is committed to continuous innovation and search for solutions to complex problems of civil engineering worldwide. Experimenting cutting-edge technologies, entrepreneurship and investing in research and human resources are the strengths of a company based in more than 30 countries.



www.trevispa.com