



Continuous flight auger (CFA)

A fast and economical piling solution for a variety of applications. Ideal for sensitive built-up areas and unstable soil.



Introduction

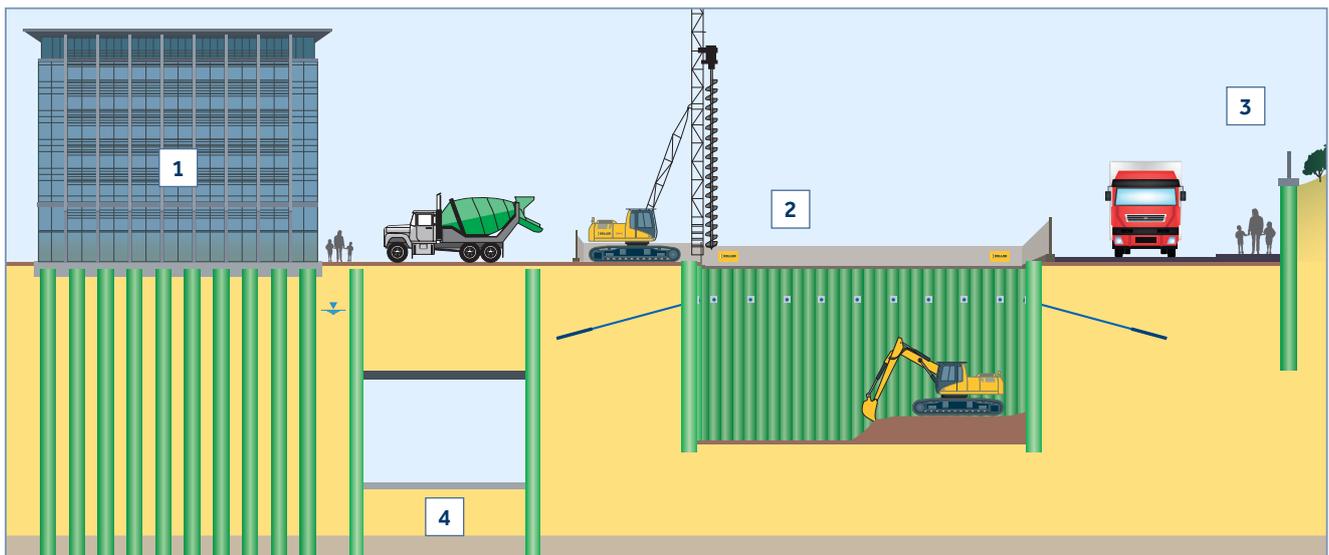
Continuous flight auger (CFA) piles are a type of bored cast-in-place replacement pile. Using high specification, instrumented rigs, the piles are drilled and concreted in one continuous operation enabling much faster installation time than for other piles of this type. Reinforcement is placed into the wet concrete after casting enabling the pile to resist the full range of structural loading.

Benefits

Keller's CFA piling system is ideal in built-up areas with weak soil conditions and high levels of ground water, due to the vibration-free construction process and low noise level. A large range of diameters are available and piles can be installed to depths in excess of 30 m. CFA piles can be installed in most soil conditions such as sands, clays, silts, gravels and soft rock. Compared to bored piles, the construction of CFA piles is very quick as temporary casings or bentonite in unstable soils or temporary support systems in water bearing soils are not required. CFA piles are an economical means of pile construction.

Applications

Keller CFA piles are cast-in-situ piles, used to provide structural support for buildings and bridges or to provide earth retention structures.



1. Foundations

CFA piles are extremely effective at providing structural support for a range of structures such as buildings by transferring loads into the underlying soil.

2. Lateral support to excavations

CFA piled walls are an established method of providing earth retention on site boundaries or close to adjacent buildings. These are generally installed as CFA contiguous piles or secant piles.

3. Slope stabilisation

CFA piles are used to prevent landslides or protect existing buildings and are often combined with other techniques such as ground anchors or soil nails.

4. Infrastructure

CFA piles can be used in a variety of infrastructure projects such as tunnelling, road or bridge construction as well as flood protection.

Technical highlights

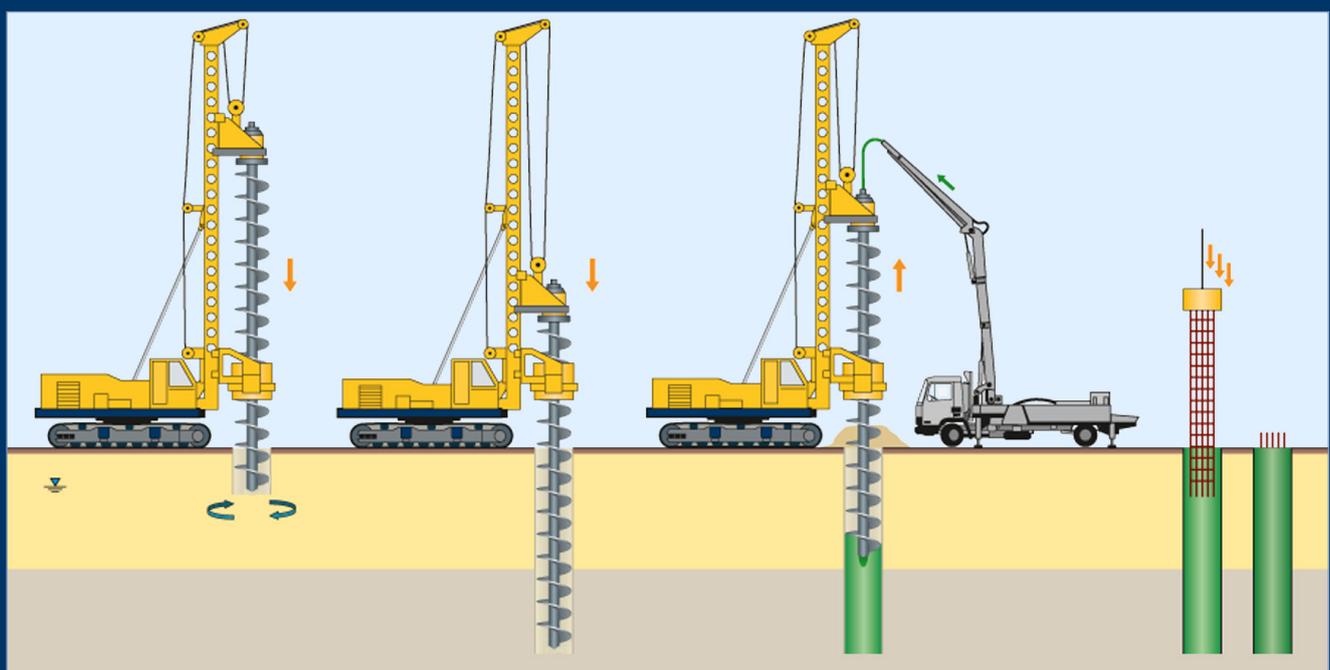
- Resists high compressive, lateral and uplift loads
- Piles with various diameters of 300 mm to 1000mm+
- Piles to be installed in depths up to 30m+
- No vibration
- Low noise level
- Quality assurance to European Standard EN 1536e level
- Rigs equipped with monitoring and instrumentation to maintain a high standard of pile construction

Product description

CFA piles are constructed by rotating a hollow-stem continuous flight auger into the soil to a designed depth. Concrete or grout is pumped through the hollow stem, maintaining static head pressure, to fill the cylindrical cavity created as the auger is slowly removed. The reinforcement cage is placed through the freshly placed high slump concrete. Typically, Keller CFA rigs are reinforced with a rigid six metre-long cage as a minimum (subject to design and specification requirements). However, there is the ability to install much longer cages as and when required by the design or specification. Where required, a specially developed vibrator unit assists with the placing and accurate location of the reinforcement cages.

Quality control

Close control of the installation process is essential to ensure the highest quality pile construction. All Keller CFA rigs are equipped with sensitive state-of-the-art instrumentation that monitors all aspects of CFA piling, including pile depth, auger rotation, penetration rate, concreting pressure, extraction rate and over-break. The instrumentation produces an individual log for each pile that includes element identification, date, time and operator details. This is reinforced by a documented QMS procedure. Quality assurance is achieved through a range of non-destructive testing methods to evaluate both pile integrity and/or load-settlement performance. Selection of verification technique is project and application specific.



Drilling

Concreting

Reinforcing

Four Ashes manufacturing facility, Wolverhampton

Keller UK installed more than half a kilometre of CFA piled wall to allow the construction of three Press Pits for a new manufacturing facility at Four Ashes near Wolverhampton.

More than 900 No 600mm diameter hard and soft piles were installed to depths of 12m and reinforced full length to provide a high retention capacity.

Keller's CFA pile technology was the preferred solution due to the unstable glacial and glaciofluvial soil deposits present. Using two state-of-the-art rigs, the conditions were easily overcome producing high quality piles and impressive rates of production. This ensured the project was successfully delivered within the tight 10-week programme.

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