

Cementation

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CFA-LC[®]

Continuous Flight Auger Piling with Low Cut-off

Application

Well suited to soft and/or water bearing ground where deep casings or bentonite suspension would otherwise be required.

Diameters generally within the range of 600mm to 1200mm with maximum depths normally up to 27.5 metres.

Used for bearing piles and contiguous, interlocking and secant piled walls.

Particularly suitable for basement construction where bearing piles are required to terminate below ground.

Advantages

- Quietest known form of piling
- Virtually vibration free
- All rigs fully instrumented
- Quick and economical

Patents

UK Patent No. 2303868
UK (Div) Patent No. 2328700
UK Patent No. 2362665
UK Patent No. 2358211
UK Patent No. 2355750
UK Patent No. 2362912
UK Patent No. 2356659
Australia Patent No. 714365
USA Patent No. 6116819
Canada Patent No. 2228518
Europe Patent No. 0842329
(Belgium, France, Germany, Ireland, Netherlands, Spain)

Trademarks

AUTO-CFA[®]
CFA-TC[®]
CFA-PL[®]
CFA-LC[®]
CCFA[®]
CEM[®]



CFA-LC[®] - Low Cut-off CFA Technique

The term "low cut-off" describes piles where the finished concrete and reinforcing cage levels are several metres below existing ground. Low cut-off piles are often specified when the proposed basement slab level is several metres below pile installation level.

The standard CFA piling technique does not lend itself to achieving low cut-offs. Conventionally the full-length hollow stem flight auger is first advanced to founding depth. Concrete is then pumped through the stem to the base of the pile. The flight auger is slowly withdrawn whilst concrete pumping continues. The soil carried on the auger is removed from the pile head position. After the auger has been completely removed it is normal to clear the pile head with a 360° excavator to reveal the concrete at the head of the pile. A reinforcing cage is then inserted into the concrete.

Exceptionally, contractors are sometimes asked to reduce the cast level of the concrete. This can be

carried out by manually bailing-out the concrete, but the practical limit is 1-2 metres. Moreover it is generally impractical for the reinforcing cage to be pushed down below ground to the required level.

Cementation Skanska has developed a unique technique which extends the range of CFA piling to include true low cut-off levels, i.e. concrete and reinforcement. The technique has been assigned the designation CFA-LC[®]. For this technique a unique casing drive system is used to allow a non-rotating casing to be inserted into the ground at the same time as the auger is advanced.

The CFA rig installs the casing, usually to below the concrete cut-off level. The auger then continues to bore to the founding depth. At this stage concrete is pumped through the hollow stem to the base of the auger in the normal manner. When the tip of the auger is an agreed distance above the cut-off level, no further concrete is pumped. The low cut-off can then be achieved by several means, depending on site conditions.

With the simplest method, when the concrete has risen to the desired level the auger is removed from the casing by a direct lift. The auger boring head is fitted with a special flap which retains the soil on the auger, leaving an open cased bore above the concrete. The reinforcing cage can be placed into the casing and if necessary, pushed down to the required level by means of a special attachment fitted to the flight auger.

The fluid may be pumped through the auger stem, or alternatively, down a double-flight "bentonite" auger.

In yet another variation of the technique, the concrete can first be placed up to ground level. The CFA auger is then used to remove concrete down to the required depth and the reinforcing cage installed as previously described.

Alternatively, depending on the nature of the underlying strata and the water table, it may be imprudent to attempt to create an empty bore in the casing. In these instances the casing can be flooded with water or bentonite, while the auger is removed. The reinforcing cage is placed as above.

Whichever of the three methods is used, the rig is then used to withdraw the casing which it then transports to another pile position. With the unique casing drive system there is no need for an attendant service crane to handle the temporary casing.

