Large Diameter Bored Piles

Cementation Skanska has a wide range of piling rigs within the plant fleet, including crane-based units, and all-hydraulic purpose-built mast machines. Both are suitable for the construction of large diameter cast-in-situ piles.

Mast machines are self-erecting. Establishment time on site is shorter than for crane-mounts and for contracts with small sites and/or few piles, this can be an advantage. The crane-mounts are more suitable for the larger diameter and deeper pile range.

All of the rigs are fitted with a rotary boring unit which operates a kelly bar. The boring tools are fitted to the kelly bar. This equipment has been used to construct large diameter piles in a wide range of strata, including very soft silty clays, non-cohesive soils and weak rocks.

The rigs can impart a vertical load on to the kelly bar to improve production in difficult strata.

In addition to installing vertical piles, rigs within our fleet can install raking piles, up to 1:4 rake, without modification.

Depths
Kelly bars can be of single or telescopic construction. Standard triple telescopic kelly bars allow for depths of up to 55m. Exceptionally, when required, extended triple telescopic kelly bars can reach to 72m below ground.

Boring Tools
Boring tools are available to cope with different strata. The range includes general purpose augers, rock augers, boring buckets and coring barrels amongst others.

Standard sizes of boring tools range from 600mm to 2400mm in increments of 150mm, and thereafter in increments of 300mm up to 3000mm.

In suitable strata it is possible to construct a dry bore; in water-bearing strata it is often necessary to progress the bore under flooded conditions, i.e. water, bentonite or polymer.

Concrete
Concrete grades up to 40N/mm² are common, and higher grades can be used where necessary.

Where the pile bore is dry, a hopper with a short tube is used to direct the concrete down the centre of the reinforcement. Under flooded conditions a full-length tremmie pipe is used.

In both situations it is often practical to terminate the concrete at a low level. This is typically used for top-down construction of deep basements. In this situation it is possible for a steel column to be plunged into the head of the concrete. Our unique CEMLOC® equipment can be used to position the columns to structural steel tolerances.
Pile Load Bearing Capacity
Depending on ground conditions pile loads of 20,000kN or greater can be safely carried on straight-shafted piles.

Special tools are available to form enlarged bases or "under-reamed" piles in suitable strata, typically stiff clays. Under-ream diameters are usually specified in increments of 150mm, and diameters of 5400mm or greater can be provided. Piles of 30,000kN capacity have been formed in London clays using under-reamers.