



Raise Boring

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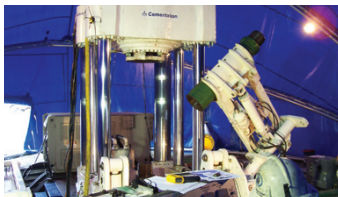
Cementation is an underground hardrock mine contracting and engineering company specializing in the design and construction of underground facilities; including shafts, ramp accesses, mine development and raises.

Our projects range from small development works to complex and technically challenging greenfield and expansion projects.

We make decisions based on safety and what is 'best for project'.

Cementation is experienced in shaft sinking, lateral development, raise boring, mechanized raising, underground construction and contract mining.

We are committed to making each project a success.



Cementation specializes in the supply and operation of raise drills to the mining and civil construction industries. A raise drill machine is used for drilling a circular shaft between two levels which is a common requirement in mining where a shaft is required for development purposes (terminating in solid rock).

Raise Boring is an alternative method for shaft and raise development between levels for mine or civil construction projects. The process involves set up of the raise bore machine on the upper level, drilling a pilot hole through to the lower level, replacing the drill bit at the end of the drill string with a reaming head, and pulling the reaming head up using the pilot hole as a guide.

Why Raise Boring:

Raise Boring is the most cost effective form of vertical raising and provides the fastest form of shaft development while ensuring no personnel need to enter the hole.

Our Equipment:

The diameter, dip angle limit and length of a raise vary with the capabilities of the machine and ground condition to be excavated. Cementation introduced large diameter hardrock raise boring into Canada at Goldcorp's Red Lake Mine in 2005. Our current North American fleet consists of 4 drills; a Robbins 97R, a Robbins 123R and 2 Strata 950 drills. The Strata 950 is designed and built within the Cementation group and is our most powerful raise drill. The Cementation group is the largest raise boring contractor in the world with a fleet of 57 raise drills.

Nominal Specifications	Robbins 97R	Robbins 123R	Strata 950
Raise Diameter	2.4-5 m (8-16.4 ft)	3.1-5.5 m (10-18 ft)	3.7-6 m (12-20 ft)
Raise Length - Maximum	800 m (2650 ft)	900 m (2950 ft)	1000 m (3300 ft)

Cementation's Focus:

Our focus is on long and large raises up to 1000 m in length and 6 m in diameter. Cementation currently holds the record for the largest diameter and longest raise bored in the Canadian Shield. This record was set at Goldcorp's Red Lake Gold Mine with a raise 5.52 m in diameter and 694 m in length.