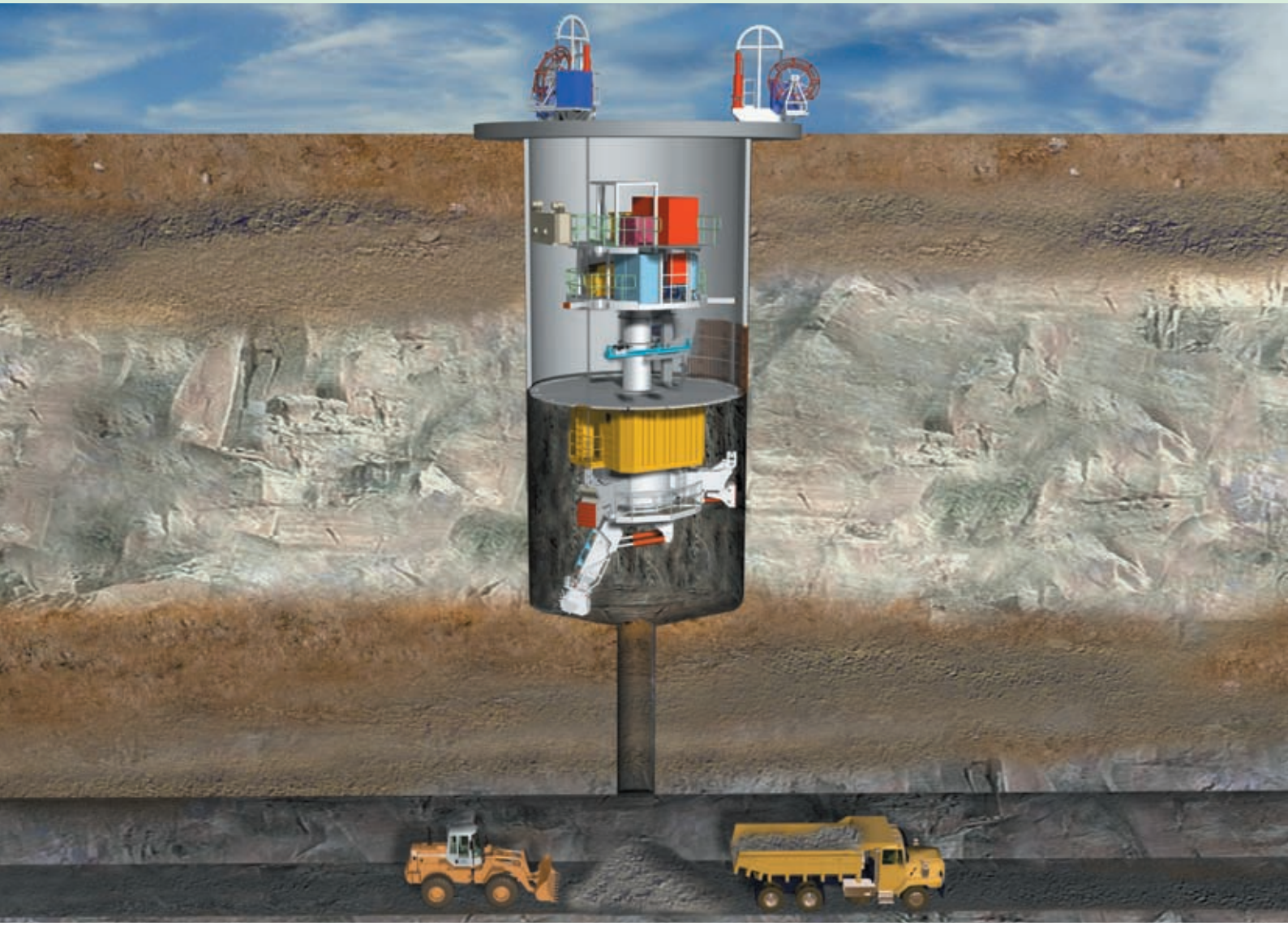


INTO THE DEPTHS QUICKLY: HERRENKNECHT VSM9600 SHAFT ENLARGEMENT.

- Project: shaft enlargement
- Background: ventilation shafts for existing tunnel
- Machine: VSM9600
- Construction method: shaft enlargement on advance hole
- Max. shaft depth: 160m

HERRENKNECHT
Tunnelling Systems

Telescopic boom with integrated cutting drum.

Lifting/lowering unit.

Cutting drum with special bits easily adaptable to different geological formations.

SHAFT BUILDING IN HARD ROCK.

REQUIREMENT

SHAFT ENLARGEMENT

Function: ventilation shafts

Shaft depth: 160m

Diameters (ID): 6,000mm – 8,400mm

Geology: fractured dolomite (up to 200MPa), limestone, marly chalk

Herrenknecht expands its product range and field of application with a particularly powerful and accurate shaft sinking machine: the VSM9600. The VSM is designed to master excavations in non-hydrous hard rock formations with high compressive strength. The VSM will drive ventilation shafts towards underground caverns. Already existing pilot holes will be enlarged from 2.40m to 9.60m OD and the VSM will operate at depths of up to 160m. Owing to the modular system, several enlargements of different diameter are possible using the same machine. The VSM also guarantees high flexibility and easy transportation to the next drill hole.

WITH HIGH SPEED INTO THE GROUND.

SOLUTION

VSM9600

Excavation Diameters: 5,300mm – 9,600mm

Rated power: 400kW

Drive: 0 – 80rpm

Total weight: 120t

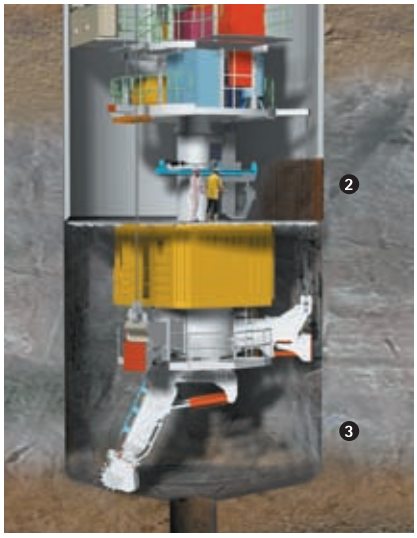
Max. torque: 78kNm

Soil transport: drop down into existing caverns

Special features:
VSM lowering/lifting by strand jacks
guidance system
one machine for different diameters
shaft lining with shotcrete robot

Shaft construction: simultaneous shaft lining and excavation

During the development of the VSM9600, Herrenknecht already attached great importance to the mobility of the unit and smooth logistical processes during shaft excavation and lining. Strand jacks for machine lowering and lifting simplify assembly and displacement of the VSM unit. Materials such as steel anchors, steel mats and shotcrete are used for an optimal shaft lining. An individually adapted cutting drum guarantees smooth excavation. While the accumulated spoil falls into the already existing tunnel below, shaft lining materials are supplied from above ground. With these optimizations, it is possible to reduce waiting times and guarantee simultaneous excavation and shaft lining operations. An average performance rate of 2m in 12 hours was achieved.



1 Lifting/lowering unit (see above)
2 Shaft lining unit
3 Excavation unit

Herrenknecht AG
D-77963 Schwanau
Phone +49 (7824) 302 0
Fax +49 (7824) 302 364
utility@herrenknecht.com
www.herrenknecht.com

Drilling for progress. Herrenknecht AG is a technology and market leader in mechanized tunnelling. Herrenknecht is the only company in the world to supply high-tech tunnelling machinery for all ground conditions and in all diameters.

HERRENKNECHT
Tunnelling Systems

01.2009