



## Herrenknecht AG company introduction. Pioneering Underground Together.

Ulrich Schaffhauser, Member of the Board, Herrenknecht AG

Manila, Philippines, February 2019





# Herrenknecht AG in Schwanau, Germany.

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- ▶ Founded in 1977
  - ▶ Conversion to Herrenknecht AG in 1998
  - ▶ Order Inflow 2018: 1.4 billion Euro
  - ▶ Today around 5,000 employees worldwide, 2,000 in Schwanau, around 200 young people in training

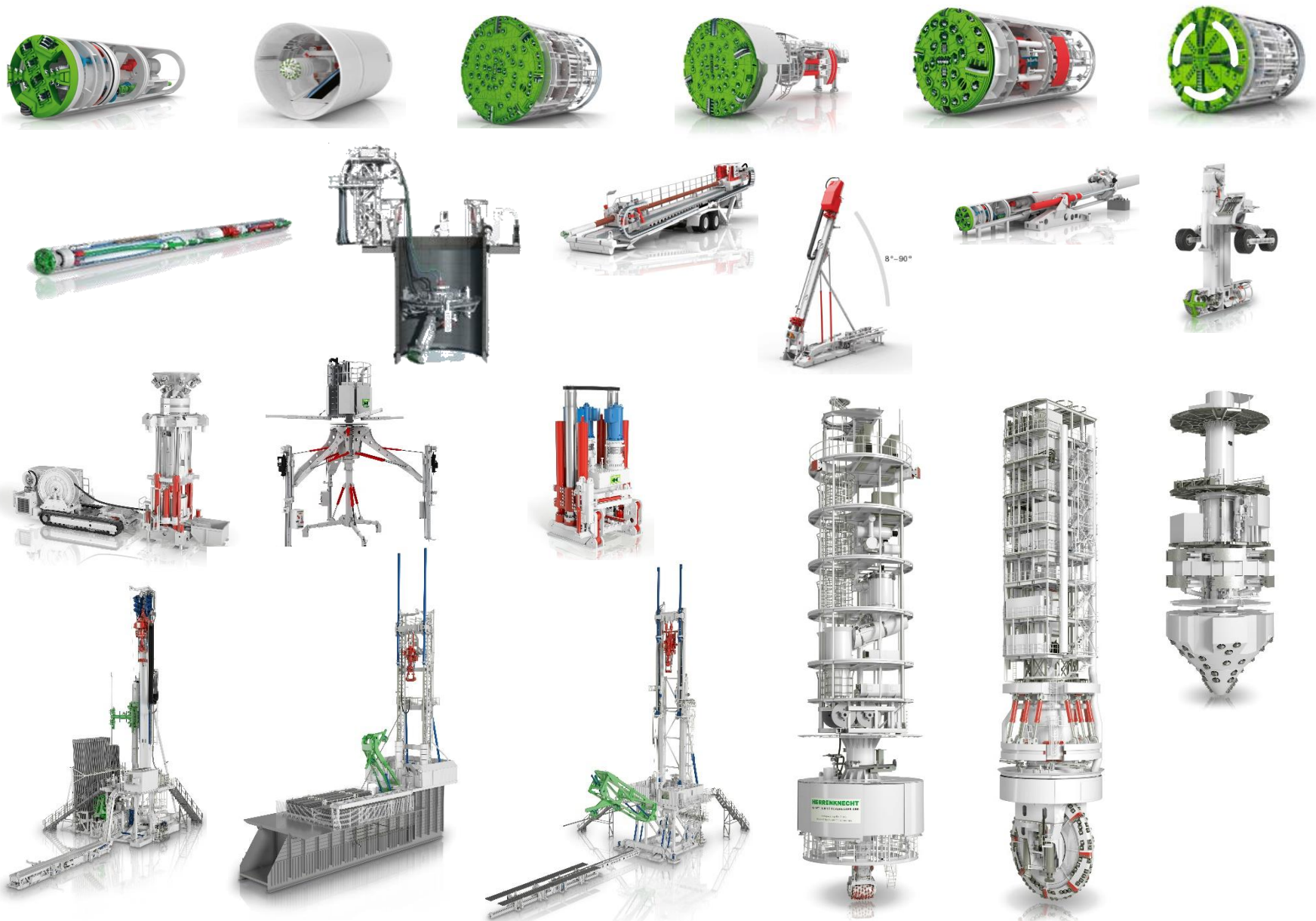


# Herrenknecht Group.

Application fields of Herrenknecht machine solutions.



Herrenknecht. Pioneering Underground Technologies

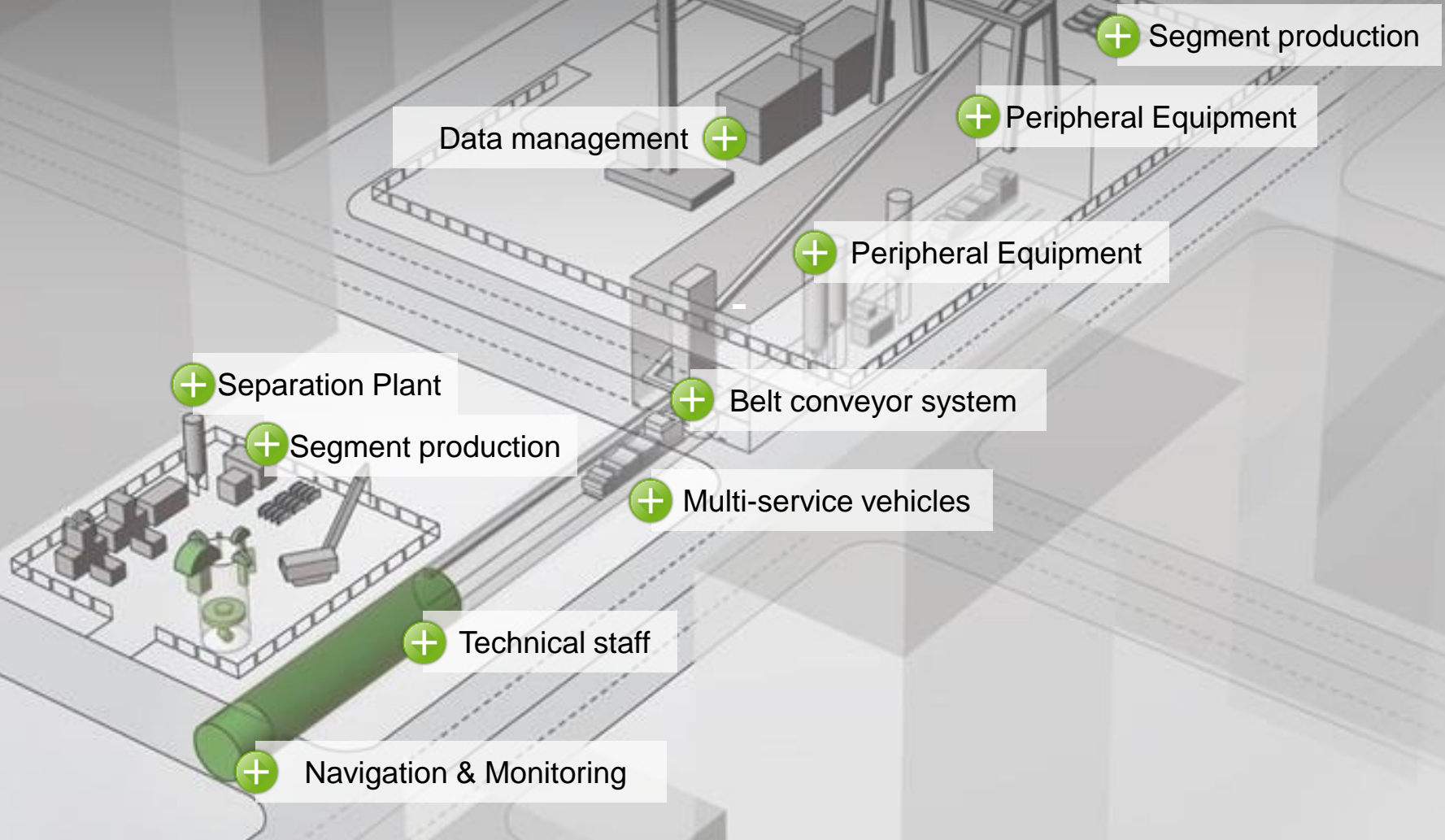


## Herrenknecht. Pioneering Underground Technologies



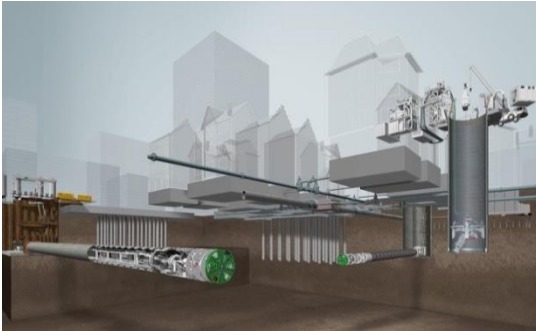
# Herrenknecht Tunnelling Solutions.

Full-Range-Tunnelling for a optimized construction site process.



# Herrenknecht Tunnelling Solutions.

## For Philippine Infrastructure Projects.



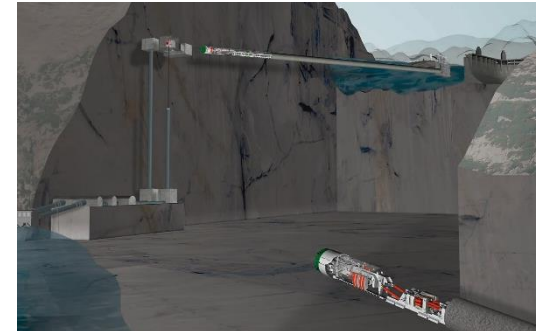
### Utility Tunnels & Shafts

- ▶ Sewage networks
- ▶ Water supply tunnels
- ▶ Cable tunnels and casings
- ▶ Shaft construction



### Pipeline Construction

- ▶ Oil & Gas pipeline crossings
- ▶ Pipeline landfalls



### Hydropower Solutions

- ▶ Headrace tunnels
- ▶ Tailrace tunnels
- ▶ Penstock and pressure tunnels
- ▶ Inclined tunnelling

# Herrenknecht Tunnelling Solutions.

## For Philippine Sewage Projects.

- ▶ 12 x AVN Microtunnelling equipment delivered since 2013
- ▶ Ø 300 – 1200mm
- ▶ **Sewage Projects** in Manila and Cavite Province
- ▶ Designed for inner-city works with restricted surface and night-time operation requirement

- ▶ AVN 1500 delivered 2002
- ▶ **Microtunnelling for Fuel pipeline, Airport of Manila**

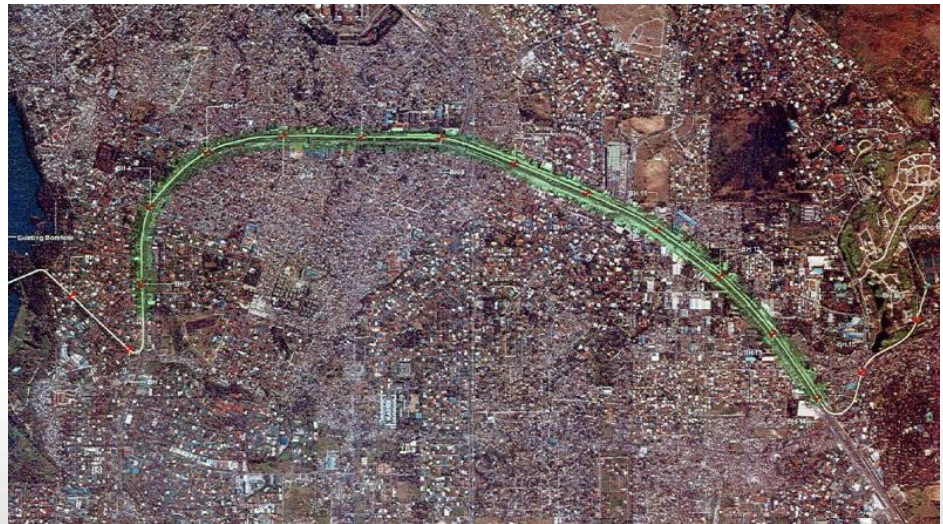




# Herrenknecht Tunnelling Solutions.

## For Philippine Water Projects.

- ▶ EPB 3100, OD 3500 delivered for **Manila Water Project**
  - › NBAQ4: Novaliches – Balara Aqueduct No. 4
  - › Tunnel length: 7.3 km
  - › Curved alignment:  $r = 80\text{m}$
  - › Disassembly in the tunnel
  - › Contractor:
    - NovaBala JV Corp.:
    - First Balfour, CMC, Chun Wo
  - › Client: Manila Water





# Herrenknecht Tunnelling Solutions.

## For Hydropower Projects.

- ▶ Uma Oya Multipurpose Development Project
- ▶ M-1684M + M-1685M, Double Shield TBM 3600, OD 4240
- ▶ Location: Uva, Sri Lanka
- ▶ Use of tunnel: Headrace + Tailrace Tunnel
- ▶ Tunnel length: 3.6 km + 15.1km
- ▶ Geology: rock



# Herrenknecht Tunnelling Solutions. For Pipeline Projects.

- ▶ Tangguh LNG Expansion Project, Pipeline landfall
- ▶ H-123; HK400M, HK500PT Pipe Thruster
- ▶ Location: Bintuni Bay, Papua Barat, Indonesia
- ▶ Pipeline Ø: 24"
- ▶ Pipeline length: **3 x 2,065m**





# Herrenknecht Exploration Solutions.

Vertical deep drilling rigs for geothermal energy, oil and gas.

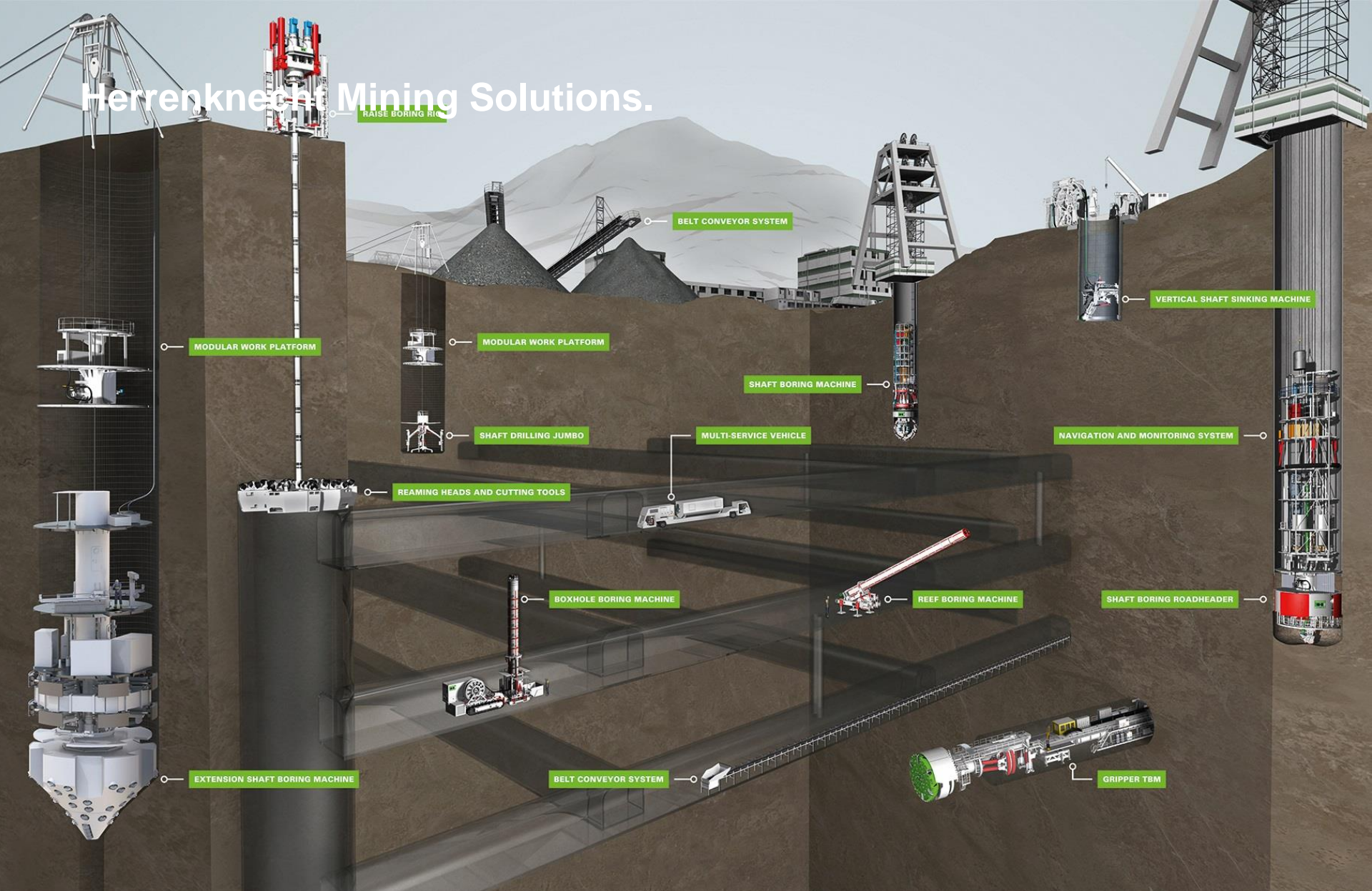


- ▶ HK150CS SDD at 90° working angle
- ▶ Geothermal Wells for Heating (NL)
- ▶ **Depth: 500 – 1,250m**

- ▶ TI-350 Box-on-box, Finland
  - ▶ **Depth: 2 x 7,000m**



# Herrenknecht Mining Solutions.



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# Herrenknecht Mining Solutions.

## Philippine Projects with HK Mining Equipment.



### ► RBR 600 – first HK Raise Boring Rig

- Machine delivered 2010
- Ø up to 6m | Depth: 1,200m
- Client: Pybar Mining Services

### ► Didipio Mine:

- Finished in total 8 shafts

### ► Carrapateena Mine:

- Reaming ongoing



A 3D architectural rendering of an underground construction site. In the foreground, a large tunnel boring machine (TBM) cutterhead is visible, partially cut off by the left edge. The TBM is positioned within a large, rectangular concrete structure. To the right, a vertical shaft is being constructed, with a crane and other construction equipment visible at the top. The shaft is surrounded by a network of pipes and conduits. In the background, several multi-story buildings are visible, suggesting an urban environment. The overall scene is set in a dark, earthy environment, representing the underground space.

**PIONEERING  
UNDERGROUND  
TOGETHER**

**THE FUTURE LIES UNDERGROUND.**

Herrenknecht. Pioneering Underground Technologies

