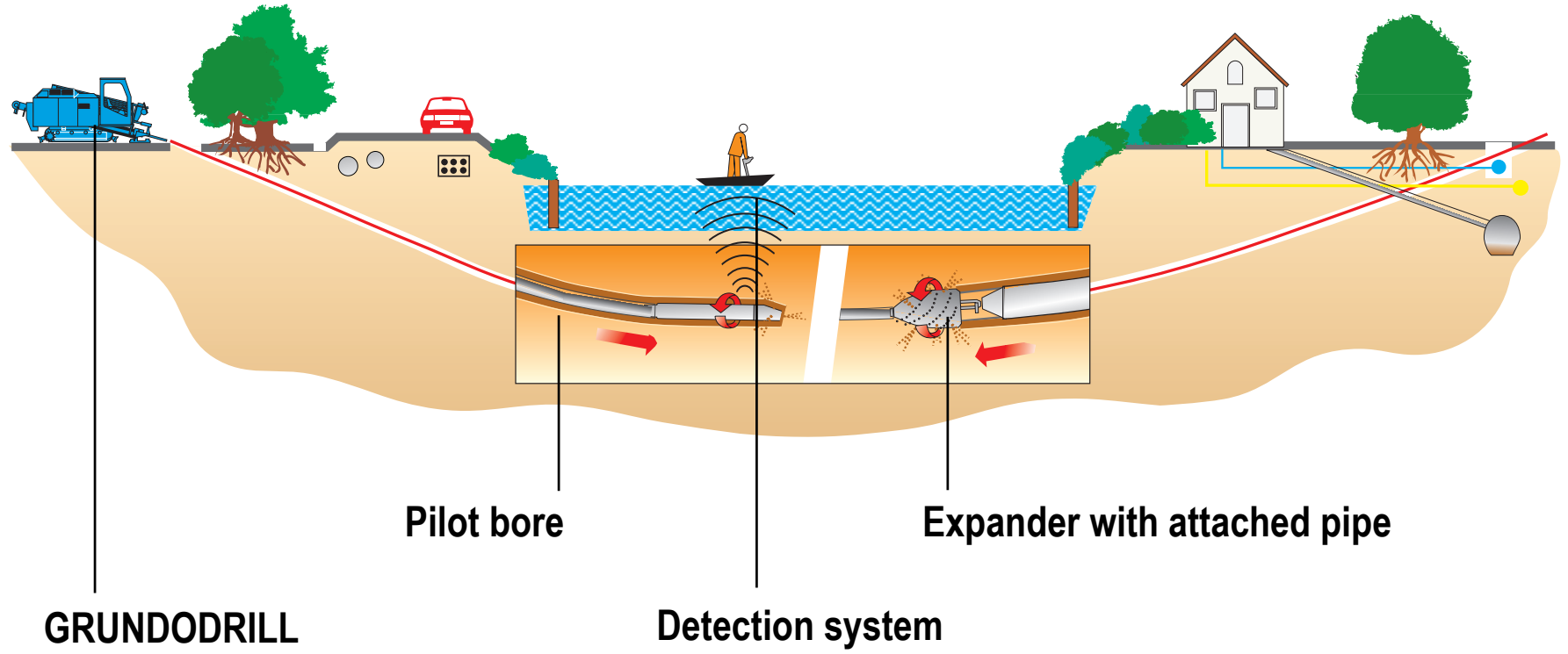


**The  
HDD method  
with steerable boring systems  
from TT**





# Method set-up for the HDD method



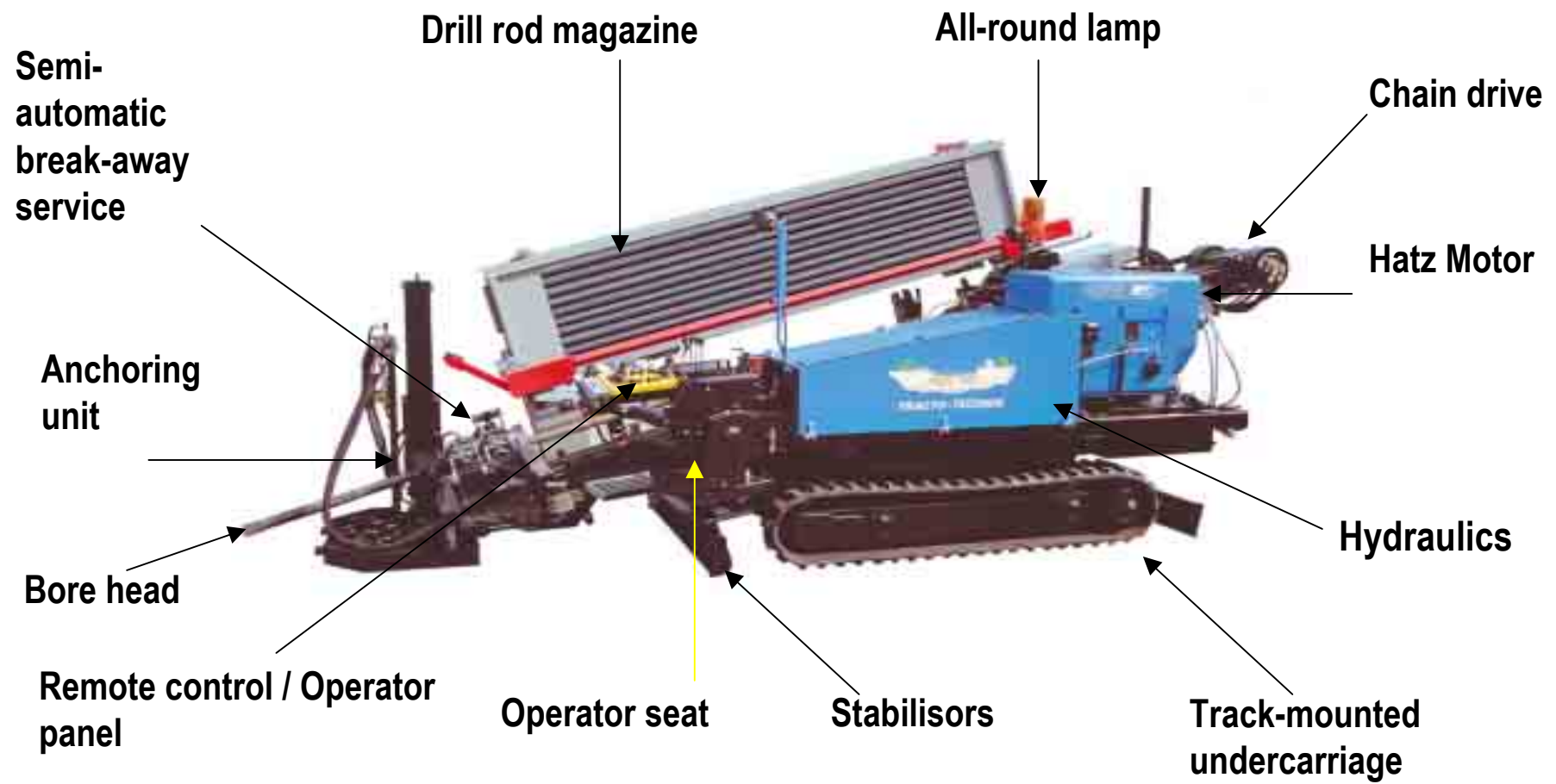
## Basic components of HDD system

- ➔ **Bore rig**
- ➔ **Bentonite mixing system**
- ➔ **Hydraulics or auxiliary drive**
- ➔ **Bore accessories**  
(e.g. Bore head, expander, pipe-puller etc.)





# Basic components: Bore rig





## Standard-detection system





## HDD bore accessories

- ➔ Bore head
- ➔ Backreamer
- ➔ Swivel
- ➔ Pipe-puller





## S-DH (Soft Drill Head)

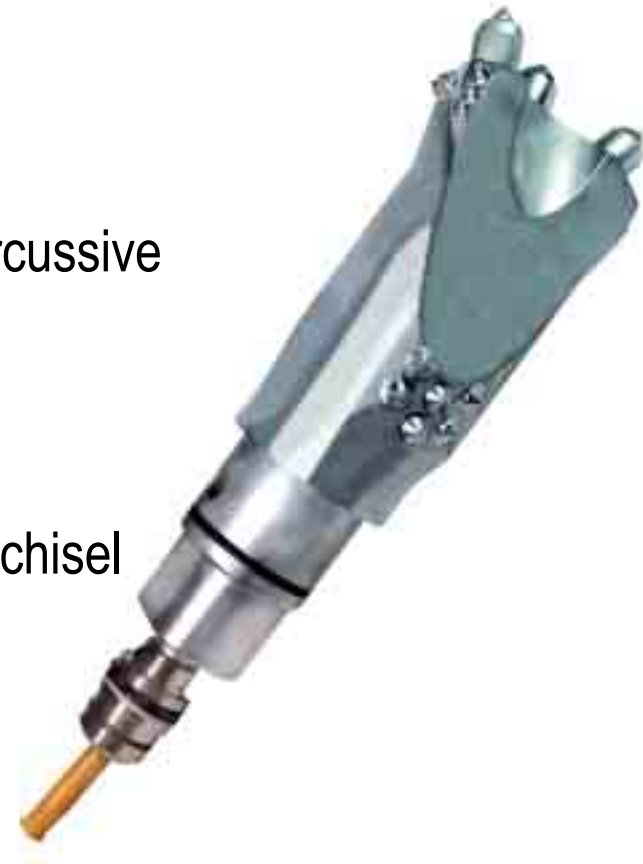
- ➔ For very soft up to medium soils  
Ø 80 mm with steering plates  
W x L (mm): 85 x 135/175 or 205, 110 x 175  
Ø 120 mm (for Grundodrill 20 S):  
B x L (mm): 120 x 200/240
- ➔ Special plates
- ➔ Bore head also without steering plates with hard metal bits





## M-DH (Medium Drill Head)

- ➔ for medium to heavy homogeneous soils, Ø 100 or 140 mm
- ➔ Chisel geometry specially tuned to the percussive hammer
- ➔ Large bore canal – good reflux
- ➔ Very easy to steer
- ➔ extra-stable, exchangeable round-framed chisel
- ➔ Fitted with hard metal bits







## H-DH (Hard Drill Head)

- ➔ for medium up to heavy fissured and loose soils
- ➔ Ø 80 or 120 mm
- ➔ oval cylindrical form with compact fitting of hard metal bits for optimal open-cutting



## H-DH (Hard Drill Head) Version 2

- ➔ for abrasive soils, e.g. pebbles
- ➔ Ø 110 or 140 mm
- ➔ conical form with all-round hard-metal bits for optimal open-cutting





## GRUNDOREAM



New backreamer generation with basic body and exchangeable blades to adapt to various soil conditions



➔ Backreamers from 100 – 200 mm  
With a basic body and three blade sizes 100, 150 and 200 mm Ø



➔ Backreamers from 200 – 400 mm  
With a basic body and five blade sizes 200, 250, 300, 350 and 400 mm Ø





### Choice of Backreamer depending on soil conditions

Dress suspensions recyclable										
Soil conditions										
	Clay [T] 0.002 mm	Loam [U] 0.002 - 0.06 mm	Fine sand [TS] 0.06 - 0.2 mm	Median sand [MS] 0.2 - 0.6 mm	Rough sand [RS] 0.6 - 2.0	Fine pebbles [FG] 2.0 - 6.0 mm	Median pebbles [MG] 6.0 - 20 mm	Course gravel [RG] 20 - 60 mm	Pebble stones [ST] 60 - 200 mm	Stones [ST] ≥ 200 mm

Type of reamer	<p><b>CUTAWAY</b></p> <p>Backreamer with TD threading from 100 250 - 650 mm, especially for clay soils</p>	<p><b>SHARKBIT</b></p> <p>for sandy soils and round grain soils</p>	<p><b>GRUNDOREAM</b></p> <p>Basic body in two sizes Size 1 up to 200 mm Size 2 up to 400 mm</p>	<p><b>GRUNDO-ROCK-REAM</b></p> <p>GRUNDO-ROCK-REAM available in 3 sizes:</p> <ul style="list-style-type: none"> <li>• for body 4" outer sets 8", 10" and 12"</li> <li>• for body 6" outer sets 12", 14" and 16"</li> <li>• for body 2.5" outer set 5"</li> </ul>
	<p><b>STANDARD-BACKREAMER</b></p> <p>up to 650 mm</p> <p>for rough soils: In standard version as pictured with guiding sleeve, bolts and cone ring, smooth or if required fitted with round-flamed chisels or shankbits</p>			





# GRUNDOREAM



 **GRAINMASTER**



 **SHARKBIT**



 **GRAVELMASTER**

Drill rod adapter

Non-return valve

Basic body

Lock pipe

Swivel



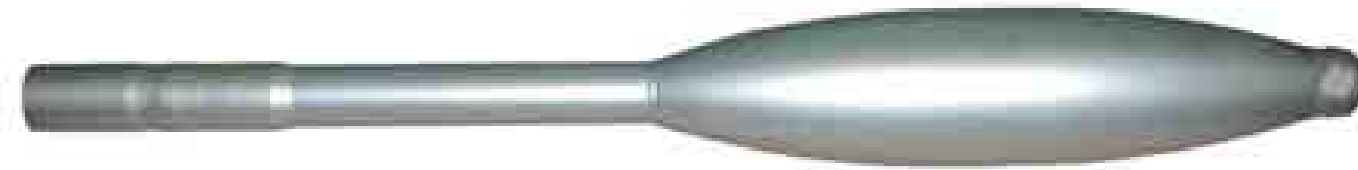
## Backreamer with round-framed chisel



- ➔ Conical form for calm run and optimal smoothness of bore canal
- ➔ Various sets for various soil conditions
- ➔ Also with flow groove for better transportation of the bore spoils
- ➔ Suitable for almost all soil types



## Push head



- ➔ For an easy push into the bore canal after an intermediate clearance
- ➔ No need for screwing on and redrawing of the drill rods
- ➔ No jamming inside the bore canal, immense time saving





## Quick-Connector



**Quick-Connector**



**Break-away tool**

- ➔ Quick connection-plug connection with non-return valve as protection against penetration of soil particles
- ➔ For a quick and easy connection and break-away of bore tools from drill rods
- ➔ Extensive loosening with heavy pipe wrenches etc. is not necessary







## **GRUNDODRILL X SERIES Twin Drive drill rods**

- ➔ Less danger of breakages, withstands high strains
- ➔ Specially heat-treated
- ➔ Up to 40% longer service life
- ➔ No dirt penetration
- ➔ Low wear of the threadings
- ➔ High Bentonite flow rate
- ➔ Up to 40% less torque required for loosening the drill rods



## Pipe-puller for PE/PP-pipes from Ø 50 mm



Standard pipe-puller

Pipe-puller with seal



- ➔ Pipe-pullers are applied for pulling in pipes and form a connection between swivel and the PE product pipe to be installed.
- ➔ Pre-equipped in series for the tensile strength measuring device Grundolog



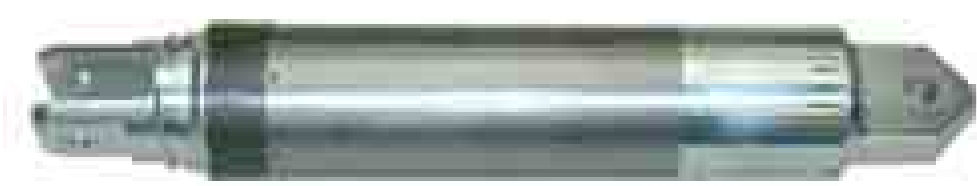
## Cutting nipples for PE/PP-pipes from Ø 50 mm



- ➔ Cutting nipples form a connection between the swivel and the Pe-product pipe to be installed. They are screwed into the pipe.
- ➔ Pre-equipped in series for the tensile strength measuring device Grundolog



## GRUNDOLOG Tensile strength measuring device



- ➔ for measuring tensile strains during PE-pipe installations with a measuring precision of 0,1 %
- ➔ three measuring bodies of 0- 80 kN, 0 – 400 kN and 0 – 1250 kN for pipes up to OD 630 mm
- ➔ Evaluation directly at jobsite, to be assembled between pipe-puller and swivel





## Mixing system MA09

1100-l-mixing tank with internal distribution system

200-l-Fresh water tank (optional)

Storage surface  
Bentonite sacks

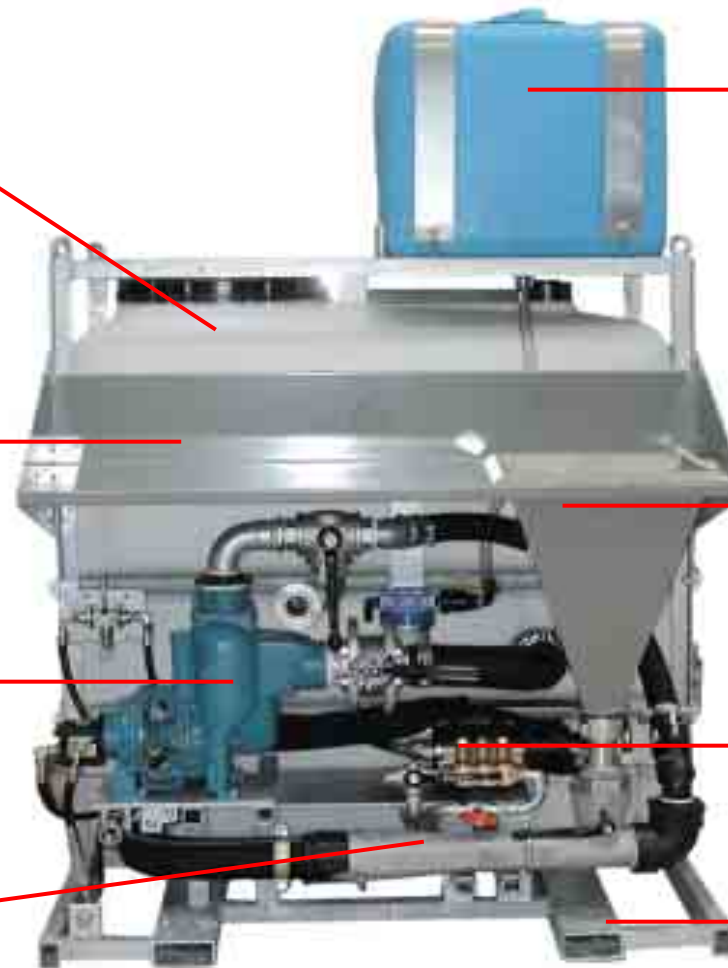
Bentonite funnel

Circulation pump for circulating (1100 l/min)

High pressure pump (max. 40 l/min)

Venturi nozzle

Hot galvanized base



## Mixing unit MA07 D

Twin mixing tank (2 x 400 l)  
with internal distribution system

Diesel drive





## Application fields for the HDD drilling fluid method

- ➔ Parallel installations
- ➔ Installations below streams, rivers, canals and lakes
- ➔ Crossings below main roads, motorways, car parks, rail tracks, airport runways
- ➔ Crossings below buildings
- ➔ Installation of pipes for irrigation and draining plants in parks
- ➔ Sanitation of waste depots





## Pipe installation measures in HDD drilling fluid method

- ➔ Drinking water pipes
- ➔ Gas pressure pipes
- ➔ Long-distance energy pipes
- ➔ Sewage pipes
- ➔ Cable protection pipes for TV, telephone, traffic systems and emergency call boxes or for low, medium and high voltage cables
- ➔ Irrigation and drainage pipes







## Installable pipe materials

- ➔ HDPE-Long pipes/pipe bundles
- ➔ Sheathed gas pipes
- ➔ Ductile cast iron installation pipes
- ➔ Steel pipes



## GRUNDODRILL percussive hammer



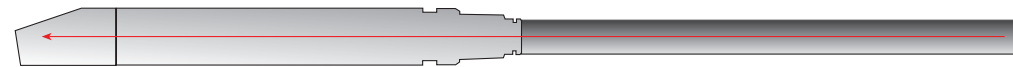
- ➔ The dynamic percussive hammer applies 28 t additional ramming energy and therefore allows for propulsion and steerability in stoney grounds
- ➔ Up to 1000 strokes per minute





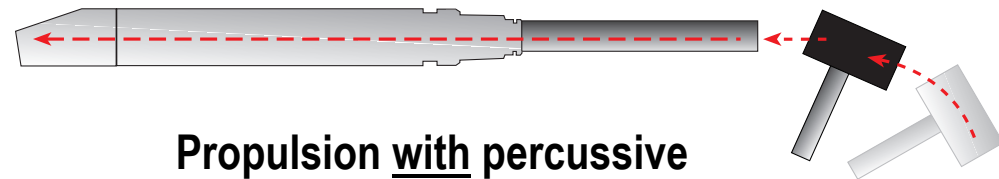
# Application of percussive hammer

- ➔ **Borable soils**
- ➔ **Sandy soils\***
- ➔ **Loamy soils\***
- ➔ **Clay soils\***
- ➔ **Flowing sand ( $U < 1,9$ )**



Propulsion without percussive hammer

- 
- ➔ **Partially borable soils**
  - ➔ **Coarse gravel**
  - ➔ **Very loose soils**
  - ➔ **Rumble**

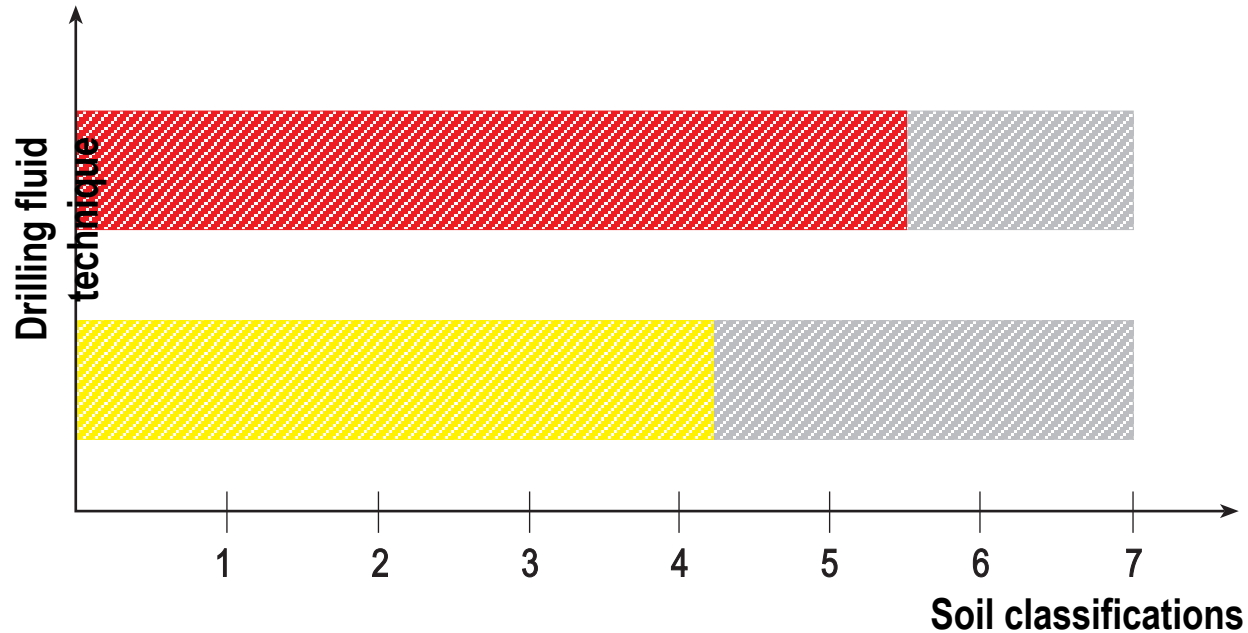





Propulsion with percussive hammer





# Drilling fluid techniques in comparison



-  = TT-bore system with percussive hammer
-  = standard bore systems (with percussive hammer)
-  = Rock drilling system



# GRUNDOROCK

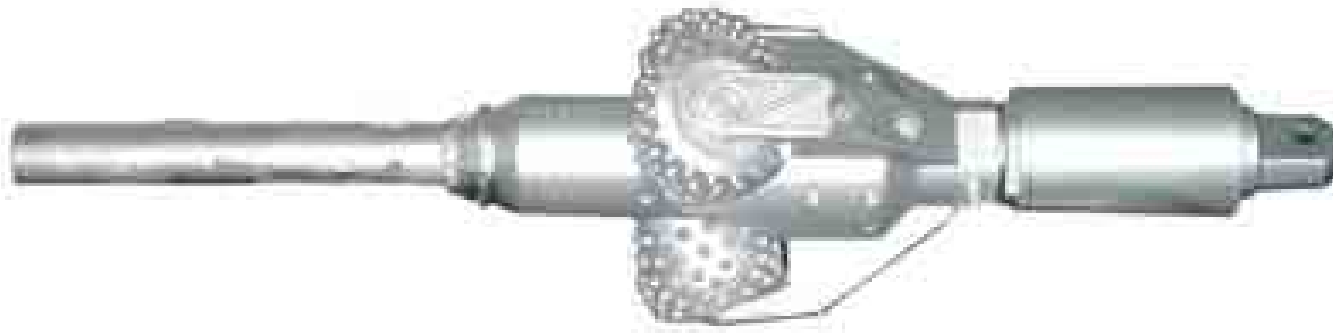
## Mud motor for rock drilling bores



- ➔ With various rock bore heads (Roller chisels) for various rock types e.g. limestone, slate, marble, granite etc.
- ➔ Low friction, low mechanical wear and tear
- ➔ Largest possible bearing strain
- ➔ Application of compressible or enriched drilling fluid is possible

## **GRUNDO-ROCK-REAM**

### **Backreamers for bores in solid rock**



- ➔ Backreamer for expander bores through solid rock
- ➔ Basic body with various cutter sets to adapt to various soil conditions and pipe diameters



# GRUNDODRILL P SERIES



**GRUNDOPIT C**  
Compact version

**GRUNDOPIT**  
Standard /  
Power version



**RUNDOPIT S**  
haft version





## GRUNDODRILL X SERIES



**GRUNDODRILL 7 Xplus TD**



**GRUNDODRILL 13X/15X TD**



**GRUNDODRILL 10 X TD**







## **GRUNDODRILL S SERIES**



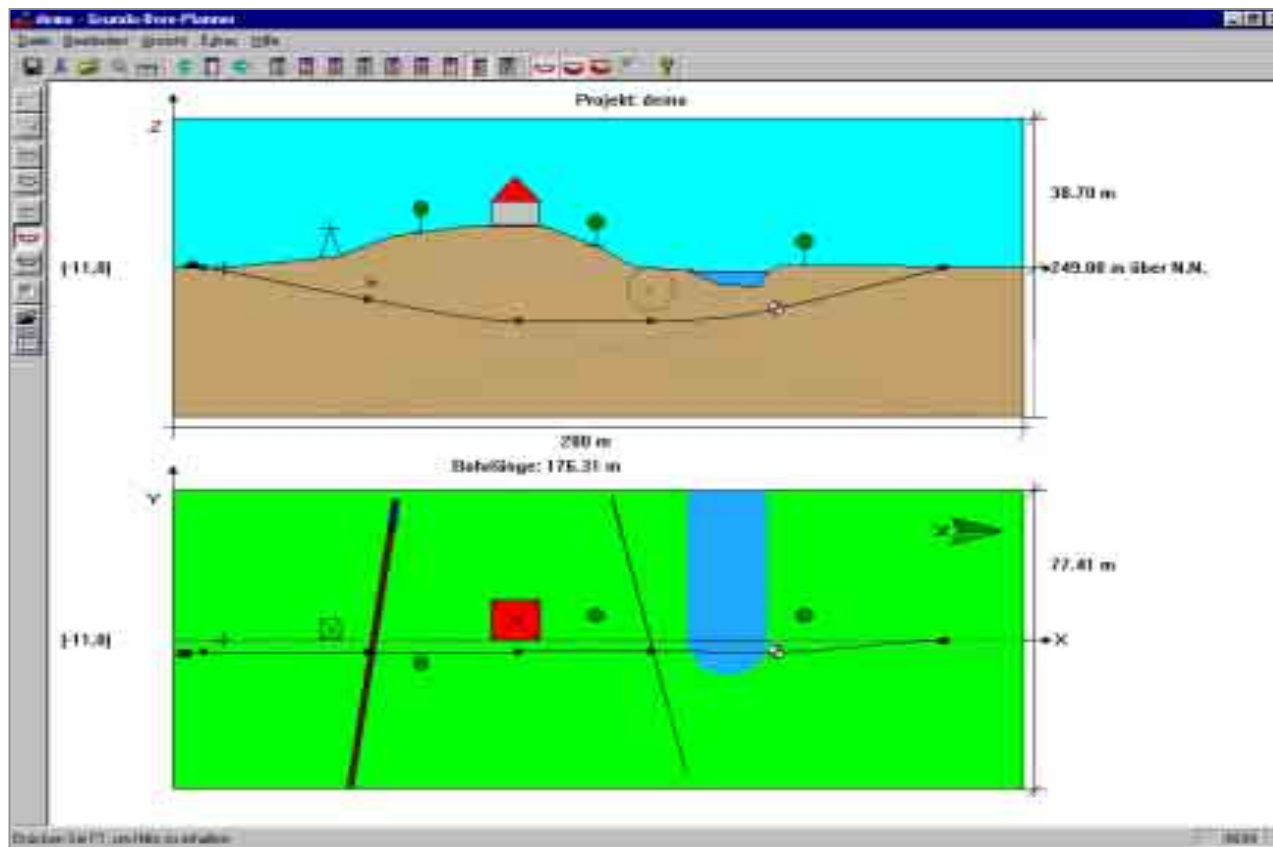
**GRUNDODRILL 10 S TD**





# GRUNDO-BORE-PLANNER

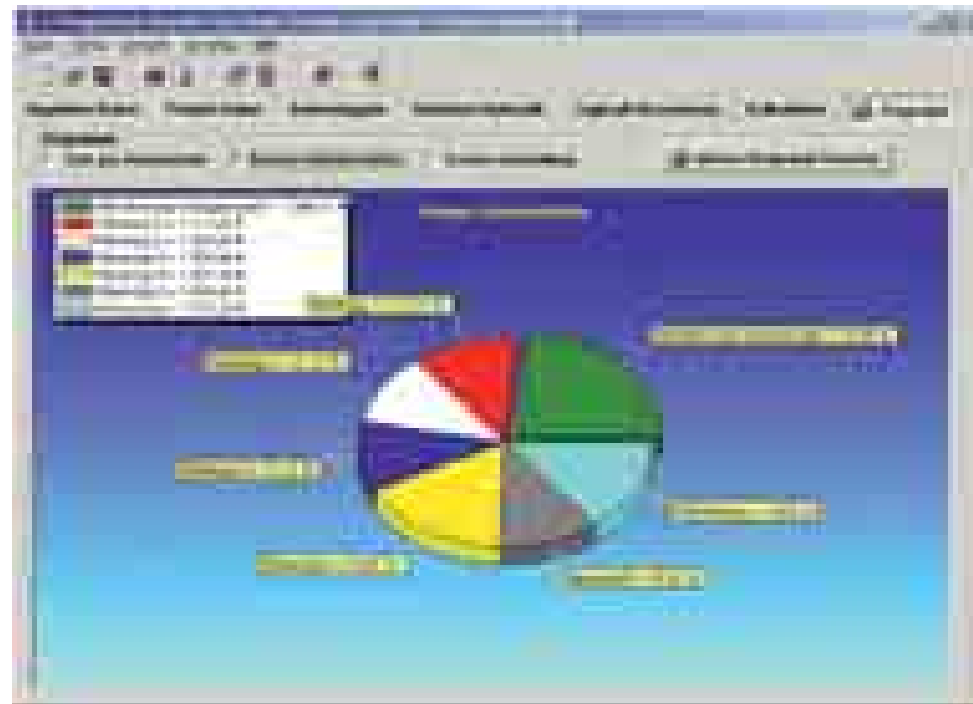
## Software for planning and carrying out HDD-bores





## **GRUNDO-COST-FINDER**

**Software for evaluation, administration and calculation of  
HDD-bores**



## Prime Drilling Large scale bore rigs

