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HDD-Drilling in hard and hardest Rock in Europe – examples of job sites

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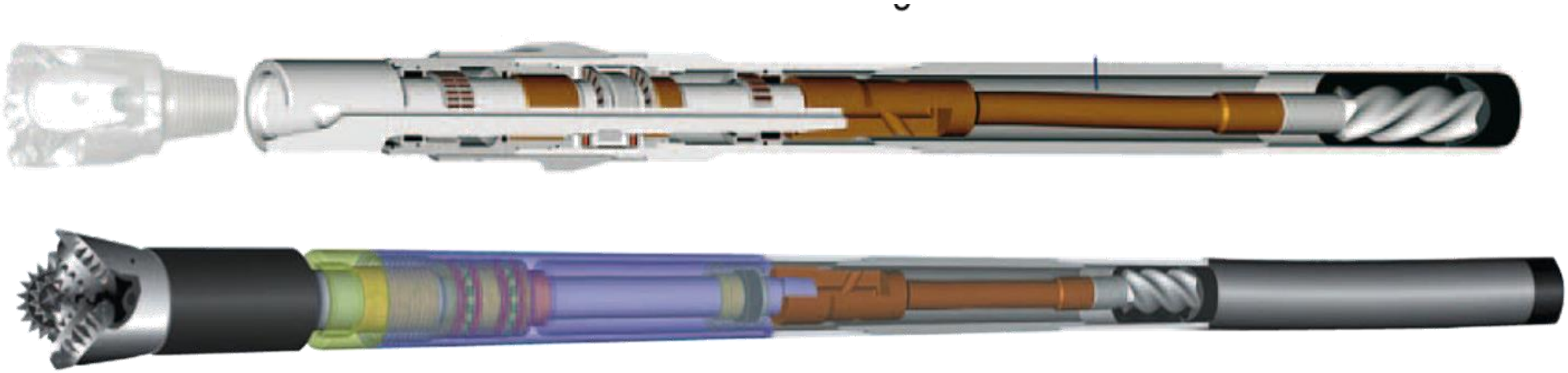
HDD drilling in hard and hardest rock in Europe – examples of job sites

Big differences in ground and even much more differences in hard rock itself

HDD drilling in hard and hardest rock in Europe – examples of job sites

Mud Motors from Tracto-Technik, Type Grundorock



HDD drilling in hard and hardest rock in Europe – examples of job sites

HDD Hole opener in operation in Postojna

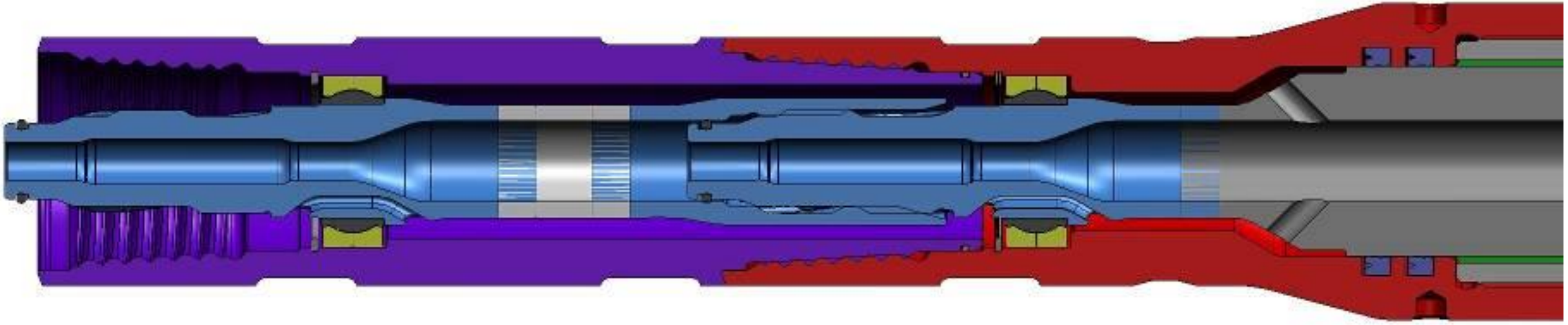
HDD drilling in hard and hardest rock in Europe – examples of job sites

Grundodrill 18 ACS with double rod technology

HDD drilling in hard and hardest rock in Europe – examples of job sites

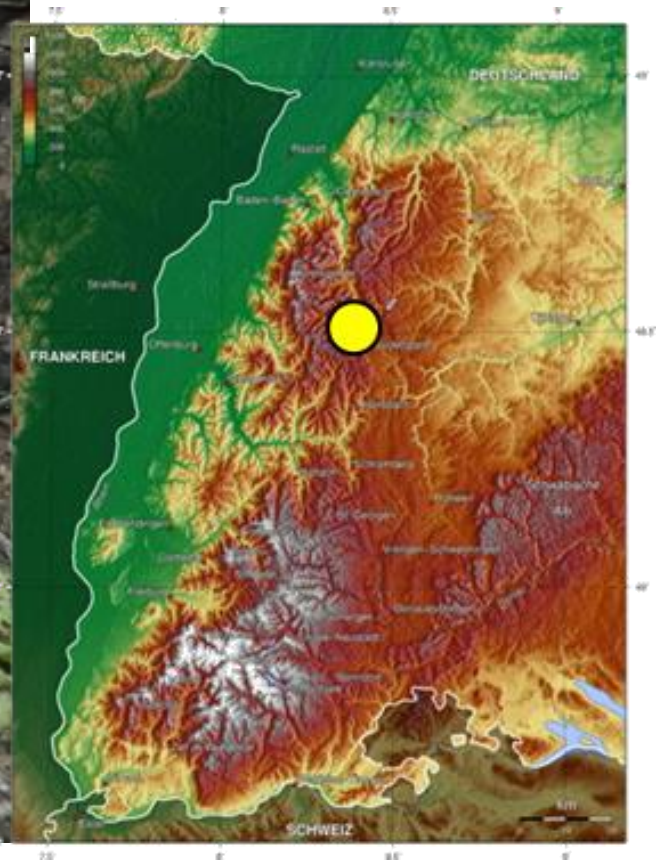
All condition HDD system with patented and special double rod construction:

Power by internal rod system, stearing and protection by external rod system.



HDD drilling in hard and hardest rock in Europe – examples of job sites

Rockbreaker Drillhead for 18 ACS



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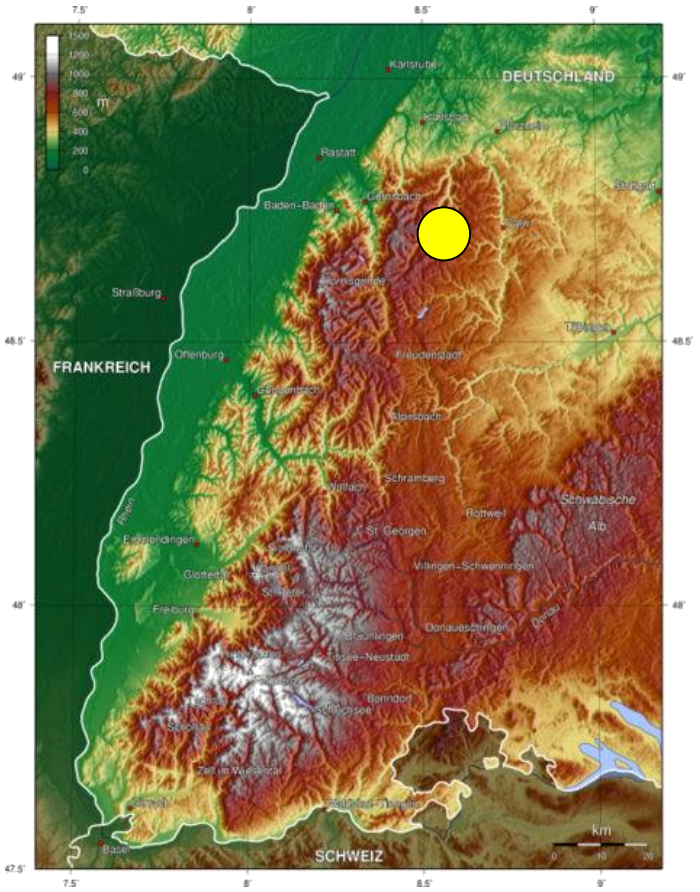

Crossing a Gorge using an Grundodrill 25 N and a Mud Moter 375 in Schwarzwald (North)

- Narrow field conditions
- Upper mottled sandstone, Compressive strength up to 220 MPa
- Length 144m
- Roller chisel 517, diameter 4-3/4“
- 3 PE-HD-pipes 90mm bundled
- Height difference appx. 26m

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Crossing a Gorge using a Grundodrill 25 N and a TT Mud Moter 375 in Schwarzwald (North)

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Crossing a Gorge using a Grundodrill 25 N and a TT Mud Moter 375 in Schwarzwald (North)

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Same situation from an other perspective

HDD drilling in hard and hardest rock in Europe – examples of job sites

Hard rock drilling in the City of Freiberg, capital of former silver mining in Germany

Job site data

Place: Freiberg in Saxonia

Soil: Gneiss rock with 250 MPa! (very hard)

Bores: 2 parallel drillings with 138 m length below multiple railway lines for 20kV earth cables

Machine: Grundodrill 20 S machine with a Grundorock 3 ¾“ mud motor and 10“ hole opener

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Freiberg job site

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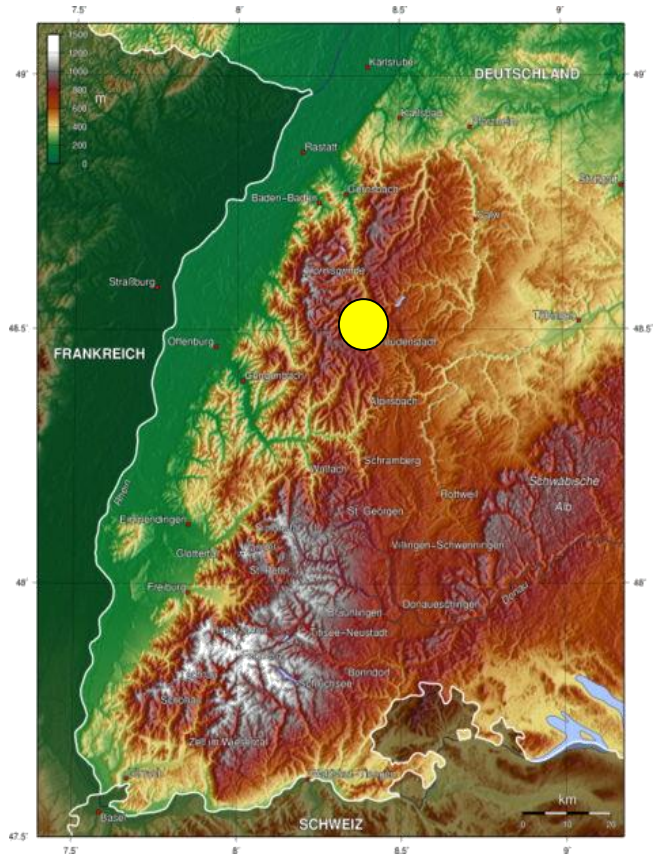
Freiberg job site

HDD drilling in hard and hardest rock in Europe – examples of job sites

Crossing of a wild mountain river at Murg / Northern Black Forest



Job site data

Place: near Forbach
between Gernsbach and
Freudenstadt / Germany

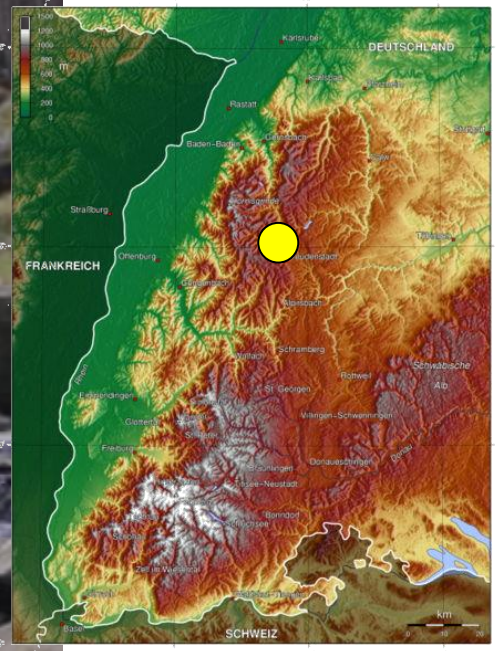
Soil: Granite boulders and massive granite (220 – 230 MPa)

Installation of 5 PE pipes for electricity (20kV) and fiber optics, length: 88 m

Machine: Grundodrill 18 ACS
with double rod system and
Rockbreaker 6 ½“ drillhead
Final bore hole Ø 10“ =
254 mm

HDD drilling in hard and hardest rock in Europe – examples of job sites

Murg Valley in Northern Black Forest



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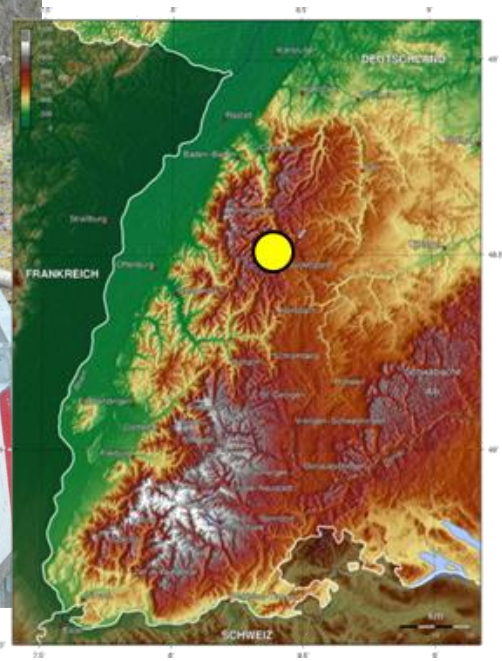
Crossing of a mountain river below boulders at Murg / Nordschwarzwald



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Switzerland

HDD Rock drilling under the Kander River in Kandersteg / Switzerland Surrounding Mountains up to 3700 m

Installation of fibre optic cables for communication

HDD drilling in hard and hardest rock in Europe – examples of job sites

Conditions of the river crossing with Grundodrill 18ACS under the Kander near Kandersteg in the central Switzerland

- **Extreme small ways to the job site, only for bikers and walkers**
- **Geology: Mixture of hard limestone layers, marl- and clay zones, and extreme blocky material from the Kander-Glacier (partly from the size of an house), Boulders, Rock fall area**
- **Use of roller cones with TCI bits type 517, diameter 6-1/2“**
- **Drilling lenght 156m**
- **2 PE-HD-pipes 63mm in a bundel**

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River crossing with 18ACS under the Kander - Detection of the drillhead

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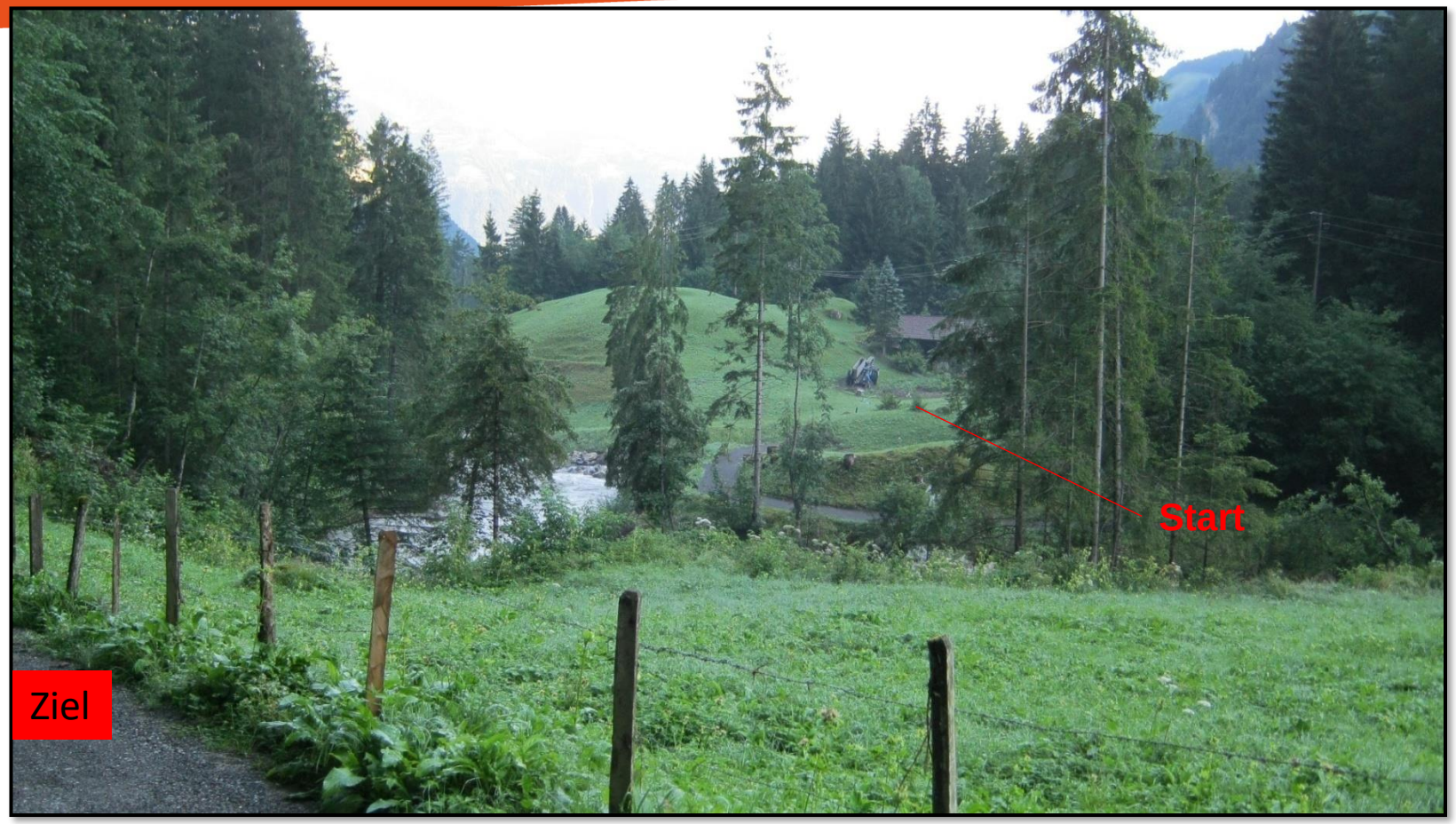

River crossing of Kander with18ACS Drilling path

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River crossing with 18ACS under the Kander

Arrival of the drillhead in the aim pit

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River crossing with 18ACS, Kander river

Last step: traction of the pipes in the drill hole

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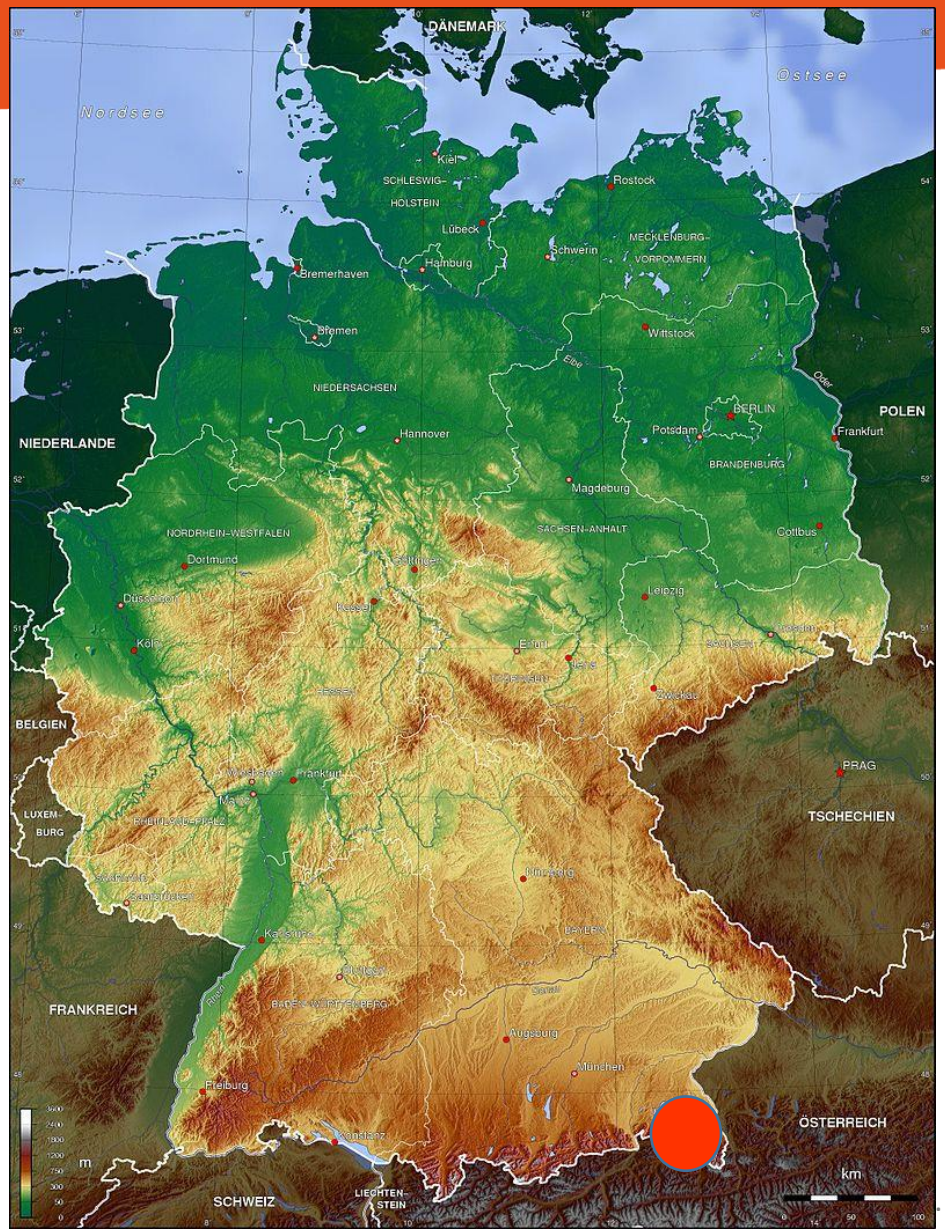

Job site in the German Alps

Schnaitzelreuth is located in Berchtes-gadener Land, Upper Bavaria

Pipe laying of a sewer pressure pipe in rock ground in a slope way

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Arriving of the Drillhead after a drilling section

HDD drilling in h
Europe – examp

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Job site in Schneizelreuth near Berchtesgaden

Traction of the Sewer-Pressure pipe

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Gastein Valley, Salzburg Region, Austria

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HDD for shortening a natural gas pipe in a rock fall region at a gorge in the Alps (High Tauern)

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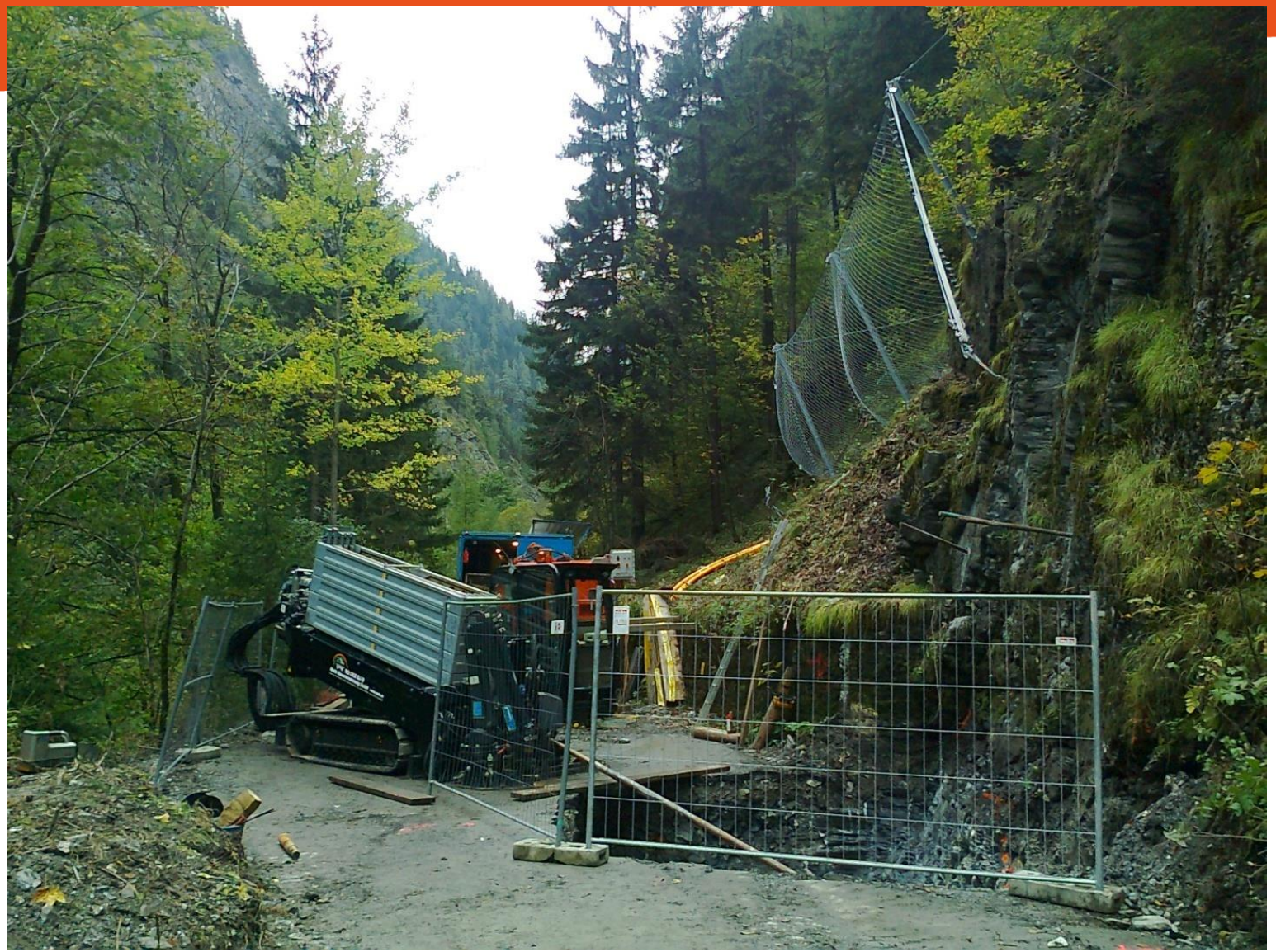

Small space for machine installation above a gorge

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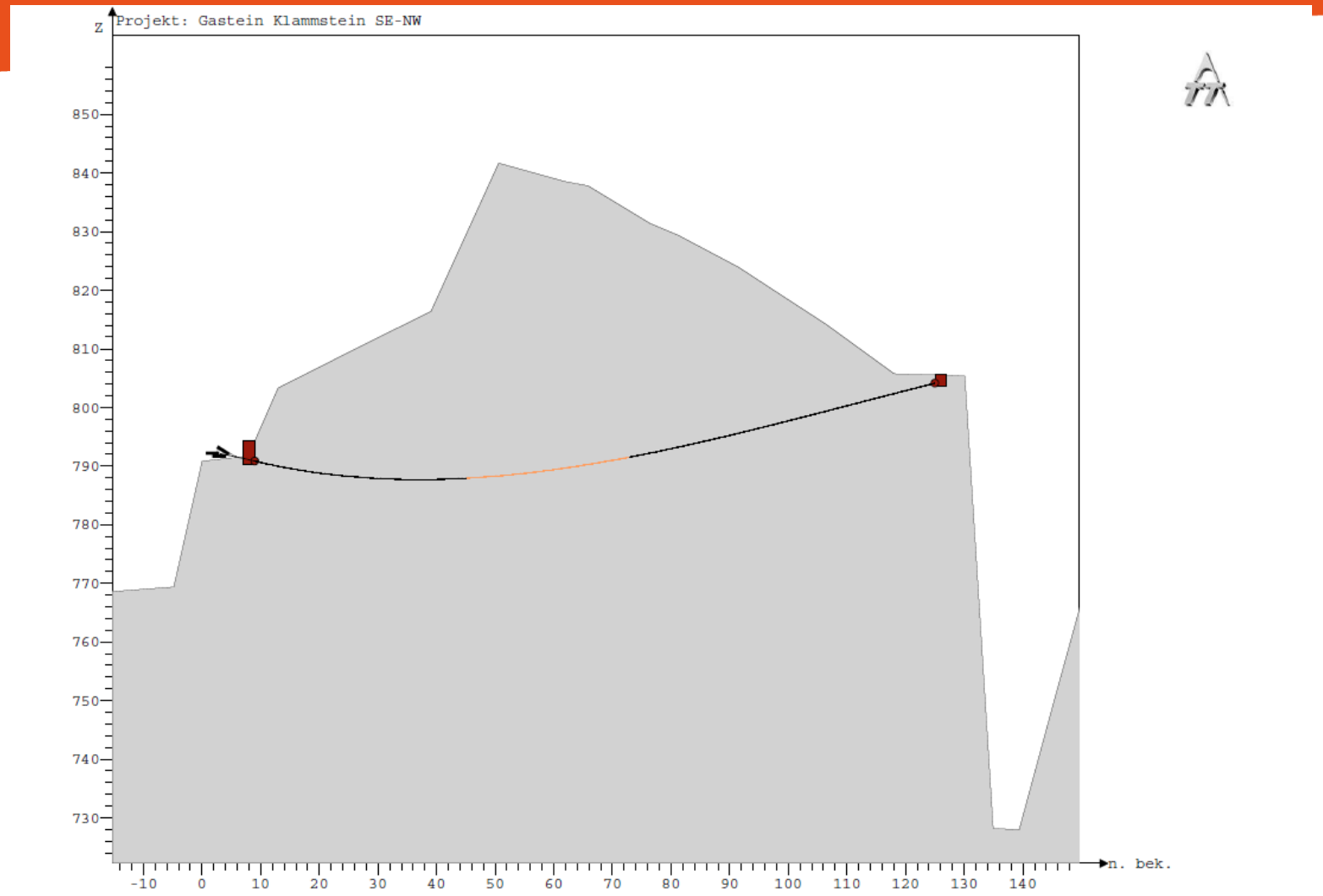

Cross section

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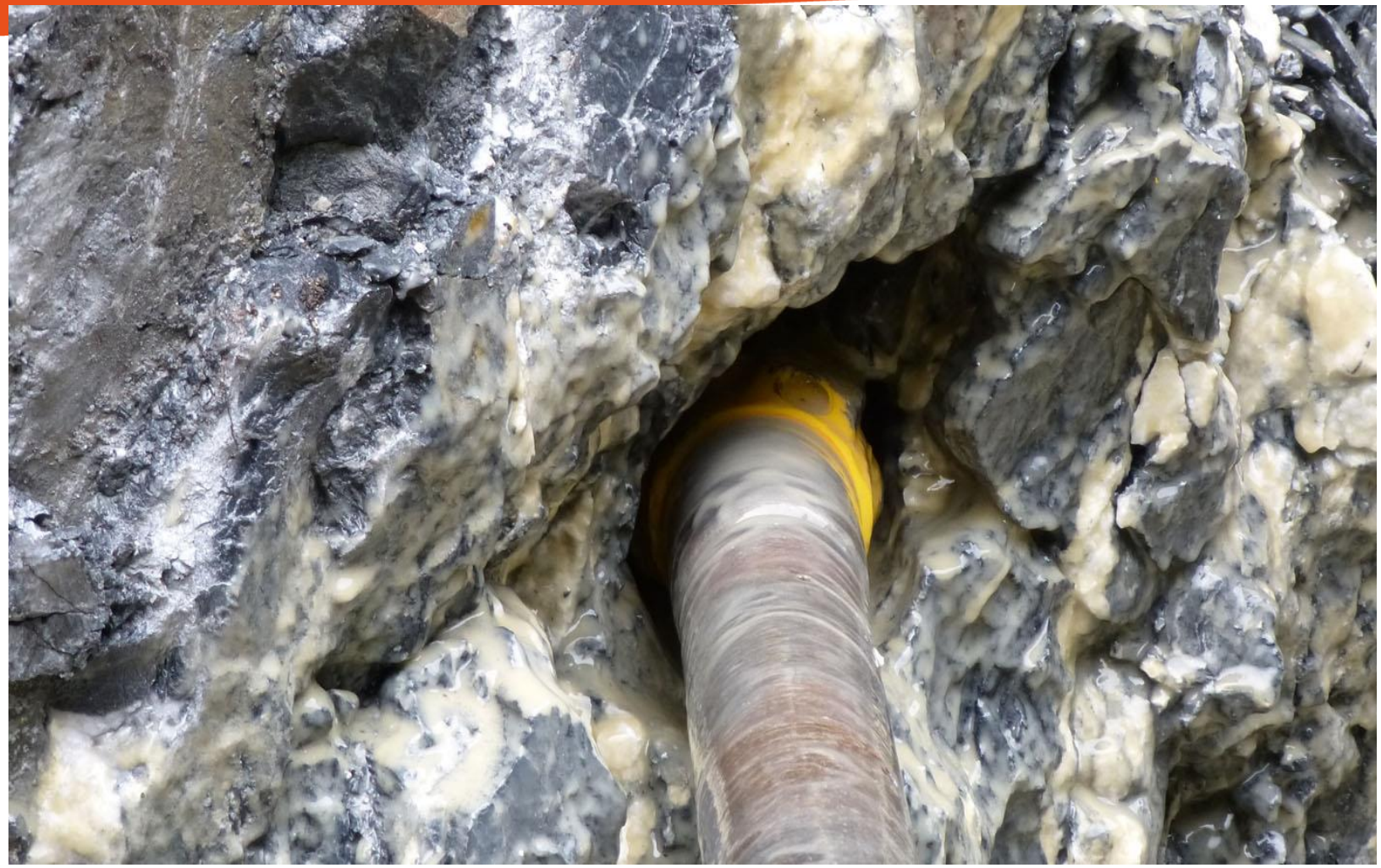

Rock drilling in the silificated Klammkalk (Tauern Mountains, Austrian Alps)

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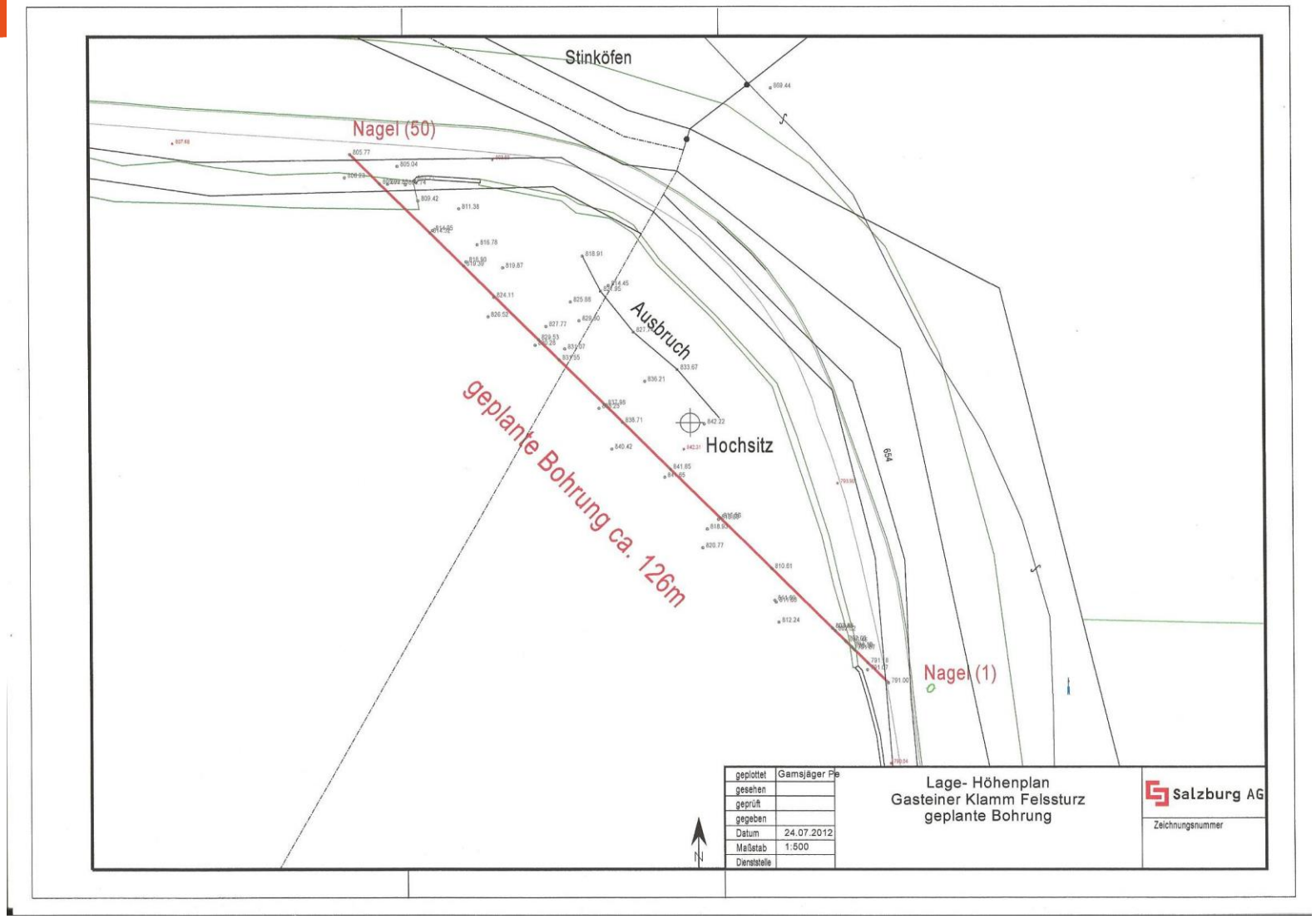

Drilling path in the inner side of the mountain for shortening the rock fall area above a deep gorge

HDD drilling in hard and hardest rock in Europe – examples of job sites

Arrival of the Drillhead with Mudmotor

HDD drilling in hard and hardest rock in Europe – examples of job sites

Lake Crossing with Grundodrill 18ACS, near Suonenjoki in Finnland

- Geology: Amphibolite (Hornblendefels) and Granite;
- Compressive strenght over 300 MPa
- Lenght 294m
- Depth 10m
- Roller cones 637 (837 later), Diameter 6-1/2“
- 1 PE-HD-Pipe 200mm
- Enlargement with Hole Opener 12“

HDD drilling in hard and hardest rock in Europe – examples of job sites

Lake crossing with Grundodrill 18ACS, Near Suonenjoki in Finnland

Preparation of the job site at start pit area

HDD drilling in hard and hardest rock in Europe – examples of job sites

Lake crossing with Grundodrill 18ACS, Near Suonenjoki in Finnland

For a better detection of the drillhead from a boat, a rope was installed over the lake

The lake is a natural reserve for wilde salmons

HDD drilling in hard and hardest rock in Europe – examples of job sites

Lake crossing with Grundodrill 18ACS, Near Suonenjoki in Finnland

Protection pipe for bearing a cable, laying on the aim side

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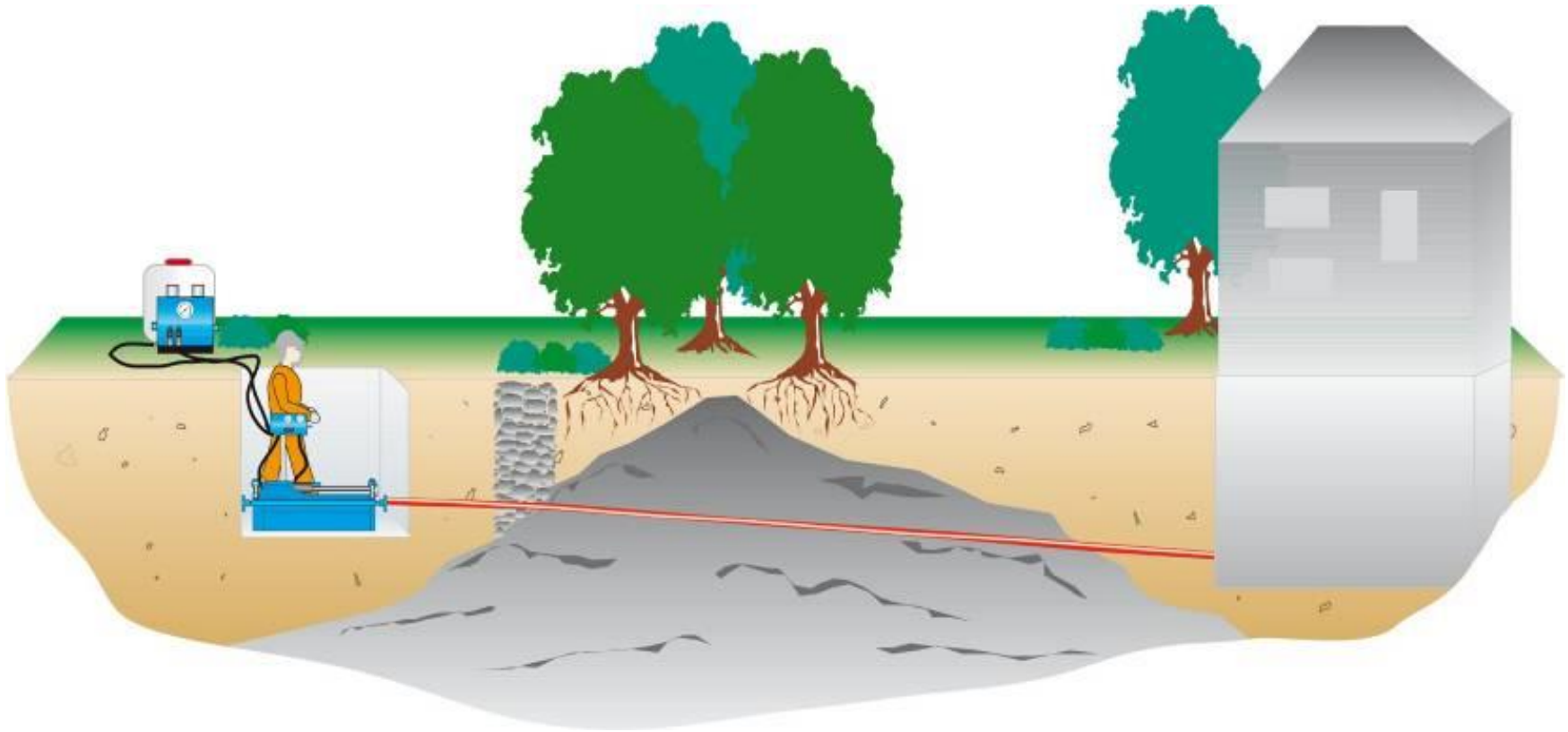
Hard rock drilling for short connections



A typical job for Grundopit with hammer bore head

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House connection in Black Forest mountains through rock of 230 MPa!

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Hammer drill head for installing house connections in rocky ground

Aufweitköpfe zum Felsbohrlochvergrößern (Hole Opener):

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Hammer drill head for rock bores

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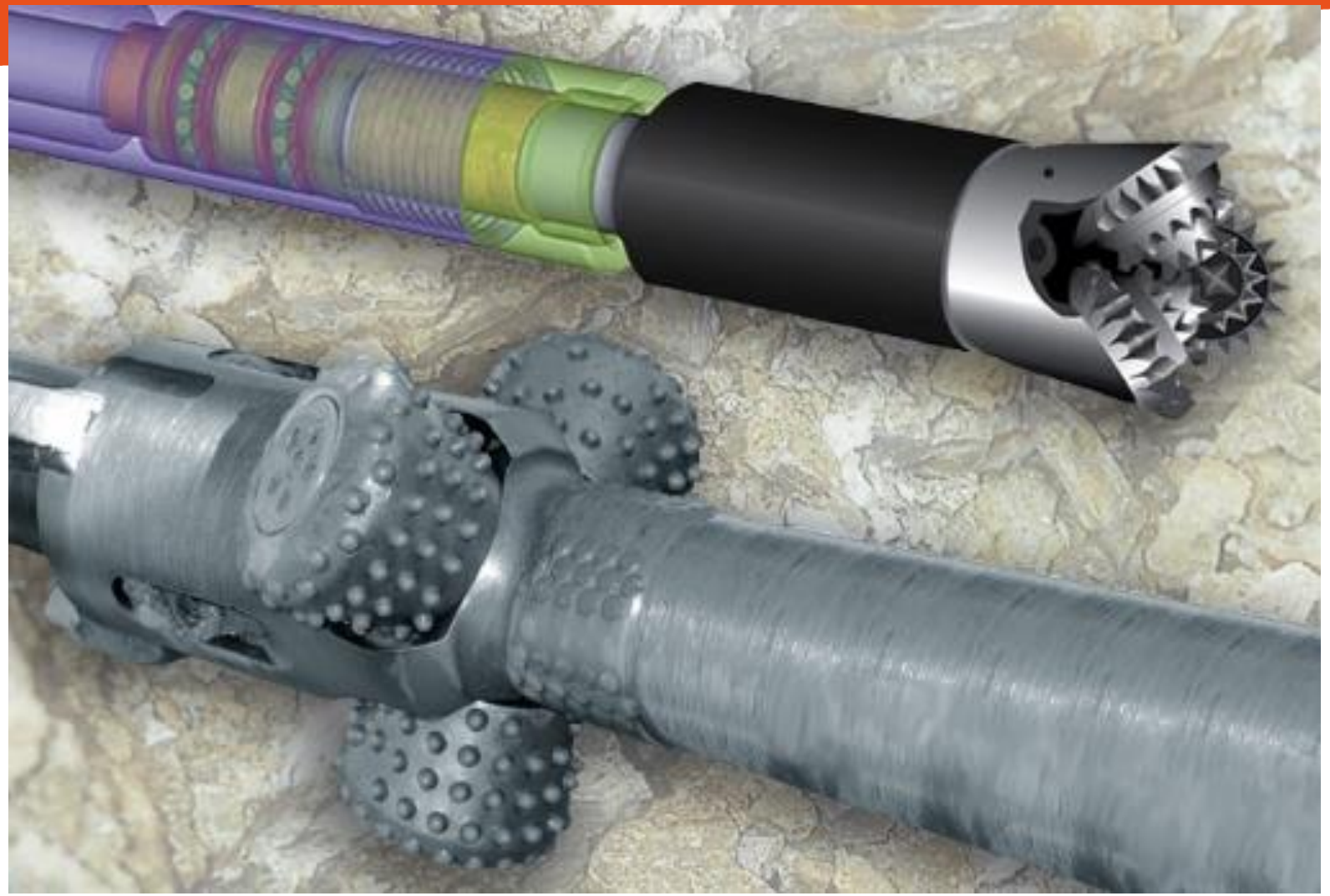

Low flow mud motor, type Grundorock

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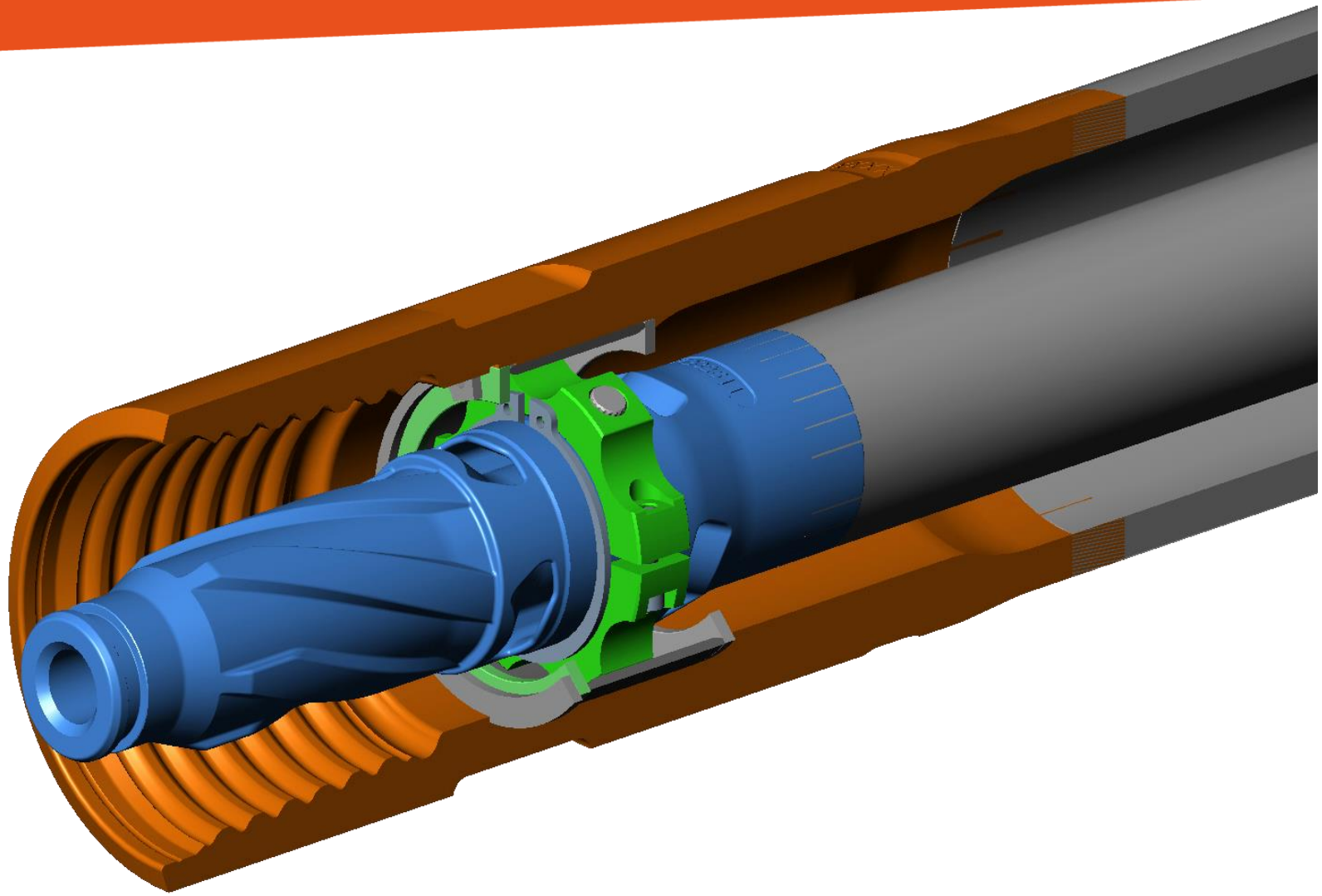

HDD - twin rod system of TRACTO-TECHNIK

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Working continously with solid equipment – even in hard and hardest rocks

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Thank You for Your Interest and Your Attention