

The core idea of this concept is to use smooth techniques to achieve the same result as with current techniques. But smooth also means slow, which is not good. What would be a combination of techniques which delivers results? There are a lot of possible techniques and a lot of combinations.



*damaged rock because of water*

If you have a small, 10 cm wide, 100 m long hole, it is not really difficult to crack the boundaries of the hole. You just have to apply pressure or vibration or make a local explosion in the hole. But there is a problem: the material will crack, and remains of any size will stay at the bottom of the hole. You can't export that material easily.

A much better approach is to produce dust or small particles on boundaries that can be extracted from the hole with a ventilator or fan installed at the bottom (or with a small pump if your transfer media is water). There is not really

a problem in excavation. The problem is how to transport material to the surface.

The main idea of this article is that even small daily advancement (1.5 cm a day of widening a vertical drill hole) is enough to achieve the same speed of construction of deep shafts as we have today. For horizontal tunnel construction, where the proposed concept of excavation is far too slow, the problem is solved differently, by applying the excavation on many places at the same time, which also matches the speed of current tunnel construction technologies.



*water jet cutter cutting steel*

So, in our drill hole, we need equipment that is able to mill the boundaries, and we need a fan or ventilator at the bottom for small particles on the ground. How should it look?

Well, I was thinking about a steel beam of about half of the drill hole diameter, where milling devices should be rotated at different levels to cut the material. Then there should be a fan at the bottom and a bag for dust at the drill hole top.