

Dear Colleagues,

I would like to share with you a short overview from an interesting appointment:

in Frankfurt/M the city is going to build up a new tunnel. Therefore I met Company "Porr"- tunnel construction. Like you see, the form – the tube of the tunnel itself is build up with "Tubbing's", the shaped concrete-components with a dimension of about 300 x 125 x 45 cm.

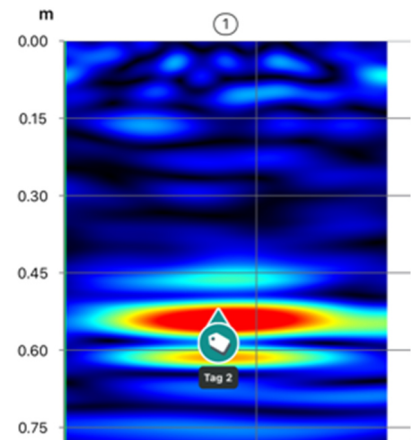


The first time I've been there, we tried to find an empty tube (which should be the first test to find cavities) under the Tubbing. For that we had some loose dirt, stones and so on between them.



What we could see on the screen:

Rebars



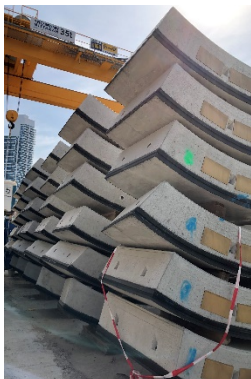
Backwall / loose dirt below in 45 cm

Strong reflection from the tube

Here you can see the test with the tube

We do had success and went into the tunnel itself, first of all some impressions:

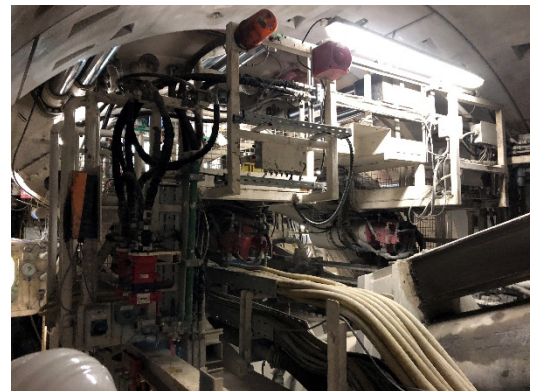
some tubbings.....



hydraulic pressure to push the cutting head forward (from ring to ring)

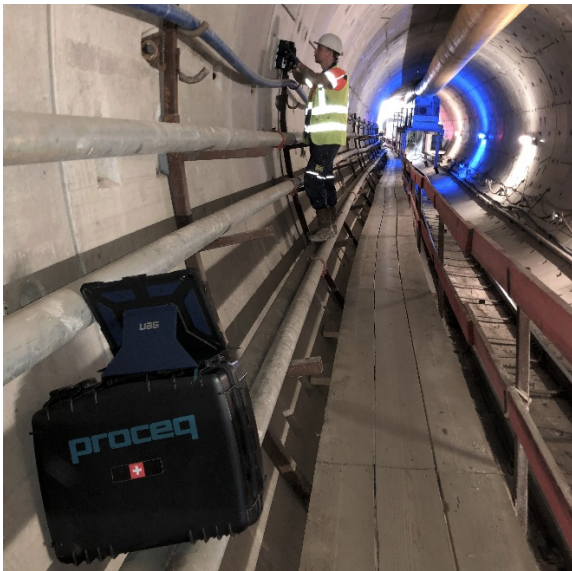


carrier system of the cutting head itself

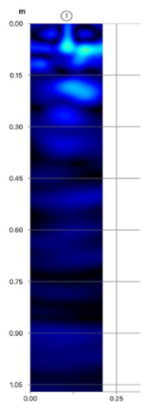


What was the next step? – searching for failures in the tunnel:

Screening with Pundit PD 8000

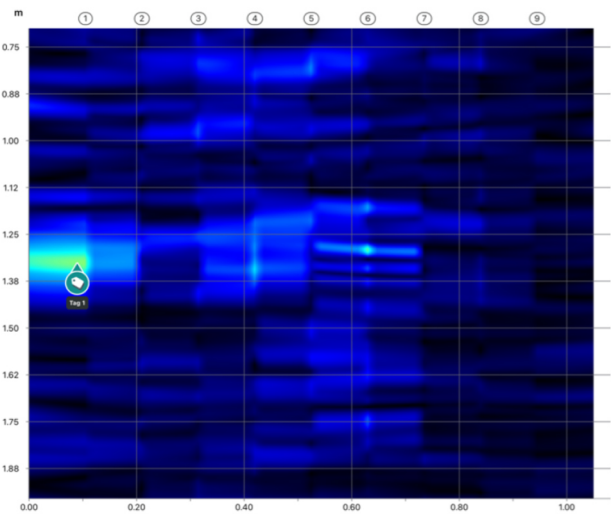


without any failure:



Just the rebars in the concrete
No reflections from tubing (45cm)
Neither then from the mortar
(about 20 cm thick)
to the ground

on the other hand we had some reflections too:



So that this reflection is below 80 cm depth (remember: 45 cm tubing + 20 cm mortar = about 70 cm construction area), something else, air or whatever...

So everything was fine..... everything: no – there was another question coming up:

What will we see, if the cavities are filled with water??? With water? – yes, because the tunnel itself is quite below the groundwater level (about 3 meters below the surface / streets) and so the tunnel is actually “under water”.

So this was the reason to went to Frankfurt/M a second time to figure out the results:

Because that the first tests have been successful the engineer in charge invited also project-manager, construction supervision and site management.

This was the subject for testing:



Concrete block

fresh mortal, still pretty soft and wet

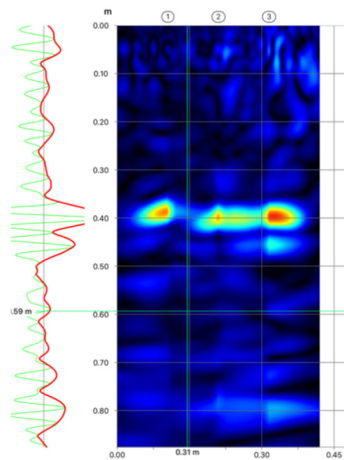
one tube with fresh water (sealed)

one tube filled with air (sealed)

The results surprised us positively, too:

You can see even the water filled tube very clear, just the intensity is a little bit less.

the reflection on line (2) comes from overlapping, you can ignore it



So that everything worked, the engineer is going to make his report and waiting to get his “go” to test in the future with our Pundit PD 8000

Best regards from Germany