

Case EC-1. Strength testing at the “Hestetorvet” slab in Roskilde, Denmark. Development of the CAPO-TEST



Professor, emeritus Mogens Peter Nielsen,
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Hestetorvet, Roskilde, Denmark

Early one sunny Saturday morning in the spring of 1974, Professor Mogens Peter Nielsen called and asked us to come IMMEDIATELY to Roskilde – the Viking town in Denmark – for testing the strength of a large slab called “Hestetorvet”, in the middle of the town.

We went, met with Professor Mogens Peter Nielsen on the slab. He ordered us to measure the strength with the LOK-TEST in the upper part of the slab, no matter what.

— “Chaps, YOU can do it. Send me the results ASAP”, he said before leaving.

We drilled from below of the slab, 80 cm thick, to ~28 mm from the surface.



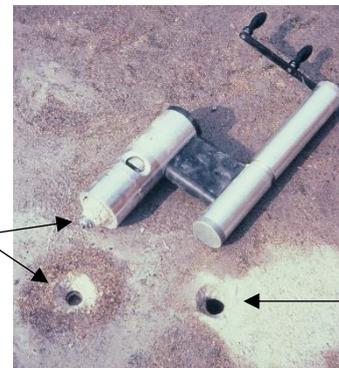
Broke the core and drilled a center hole, 8 mm in diameter, planed the surfaces for a 25 mm distance, inserted a LOK-TEST disc from below and threaded it into a pull bolt from above, connected to the LOK-TEST pull machine. Tested to failure and got 28 kN as the pull force. One test lasted 1 day.

Then, I started thinking of making another system, similar to LOK-TEST, but with testing from the top surface.

Being a dedicated mechanical engineer specialized in diesel engines, at that time, with particular reference to its pistons and piston rings, I took the piston ring technology (slicing the ring and expanding it for position in the piston groove) and did the opposite. Make a ring, slice it, compress it for expansion into a groove. At the

dentist I saw how their tools had a slim axel with a larger diamond bit at the end, perfect for making a groove in a pre-cored hole. The parts, included the expansion tool, were designed and made rapidly.

We went back to the slab, cored a hole, planed the surface, recessed the groove, inserted the compressed ring on the expansion tool, expanded the ring to full insertion in the groove, and loaded the ring to failure of the concrete, similarly as with LOK-TEST.



First CAPO-TEST
in the world,
1974

LOK-TEST
after coring from
below

It worked! And one test only lasted 20 minutes.

On 6 tests we got pullout forced ranging between 25 kN and 30 kN, averaging 27.0 kN (equiv. to 27.7 MPa cylinder strength based on the general correlation).

Asking Professor Mogens Peter Nielsen what he wanted to use the test results for, he answered: “The shear capacity of the slab is low due to corrosion of reinforcement. However, the slab has a lot of concrete around it, making it act as an arch, that is why I want the strength at the top of the slab for calculations”.

Thank you very much to Professor Mogens Peter Nielsen for his immense inspiration to develop the CAPO-TEST.

What a Professor!

Reported by:

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