

Power Plant Eemshaven

NEIDHARDT
GRUNDBAU GMBH

Project Owner:

RWE AG

Client:

Arge VIMA (Visser & Smit Bouw Mainka VOF)

Quick Info:

Building pit anchoring for the erection of the hard coal power plant in Eemshaven, The Netherlands

Technical Information:

System:	BBV temporary strand anchor 4 x 0,6", steel grade 1570/1770
Quantity:	1.070 pcs.
Length:	18,50 – 45,00 m
Service Load:	up to 515 kN
Test Load:	up to 770 kN
Technique:	rotary percussive flush drilling
Building Ground:	sand, in parts with water pressure
Time Frame of Works:	August 2009 – May 2010 and September 2010 – February 2011

Despite efforts to promote renewable energies, the modernisation of the central European power supply made the building of another hard coal power plant necessary. Our contribution to this project lay in producing the tie-back anchors for several building pits. First, we were contracted with securing the pits OUMA, ROUGB and ROUBA. In a separate bid we later acquired the building pit A0UPA.

In both contracts we produced a total of 1.070 temporary BBV strand anchors, type 4 x 0,6", with two drill and grout units, on average. Despite water table drawdown some ground anchors in the lower layers had to be drilled against water pressure. As measures to keep the water table low were instilled only for the duration of the building pit construction, all anchors were fitted with a watertight head structure for the remainder of the useful time span. Consequently, our strand anchors were pre-tensioned against a pipe socket with a ground plate. For water tightness, we installed a packer that sealed the room in between steel strands and steel pipe into the pipe socket. After testing and pre-stressing we pressed PU foam into the remaining space in between packer, bearing plate, and protective screw cap through a centric perforation inside the head block.



Image 1



Image 2

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A ventilation hole on the bearing plate was then sealed with a screw packer. In order to succeed in drilling against water pressure while avoiding the flushing out of soil and grout material, we cooperated with Fa. Scheer in designing a special sealing structure that was fixed into the pipe socket, in order to mount a drill stencil and to hold the necessary bore packer in place during drill works. The drill stencil was screwed to the pipe socket via a flange, and the bore packer was attached by means of a lock ring inside the steel pipe. Both the mounting of all these parts and pieces and the following drill works turned out successful.

However, a series of unfortunate circumstances led us to make a vital mistake during testing and prestressing works inside the building pit A0UPA toward the end of the project. Fortunately, in the course of our own quality control inspection, we were able to detect our mistake just in time. On twelve anchors, we had mistakenly mounted smaller bearing plates than necessary, such that anchor forces were not transmitted onto the especially designed steel structure but instead immediately onto the sheet pile via steel pipes meant only for protection against corrosion and mechanic impact. After informing our client, we quickly sketched out several different methods for renovation in an effort to minimise any delay for subsequent works. After our preferred solution had been approved, we first released the tension on these anchors and demounted the anchor heads. Then, we extended each steel strand and mounted the anchor heads anew according to plan.

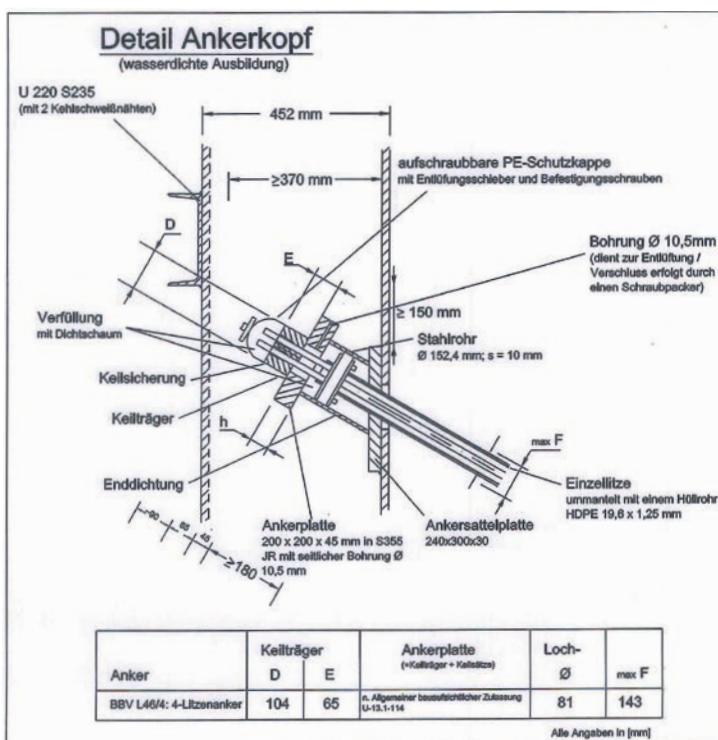


Image 3

Destressing the strands by means of blow-torching raised the question, whether the bearing capacity of the strands might be diminished by the heat of the blowtorch. In a practical trial on our building yard, we were able to confirm that concerns were unfounded because the temperature increase on the steel strand in the load bearing area remained well below 100°C, which complies with German standards. Nonetheless, blowtorching on such structurally sensitive building parts required additional structural safety measures. After all, the whole renovation process was conducted in a matter of only two days, and our works were inspected and approved by a state-approved technical expert to the content of our client.