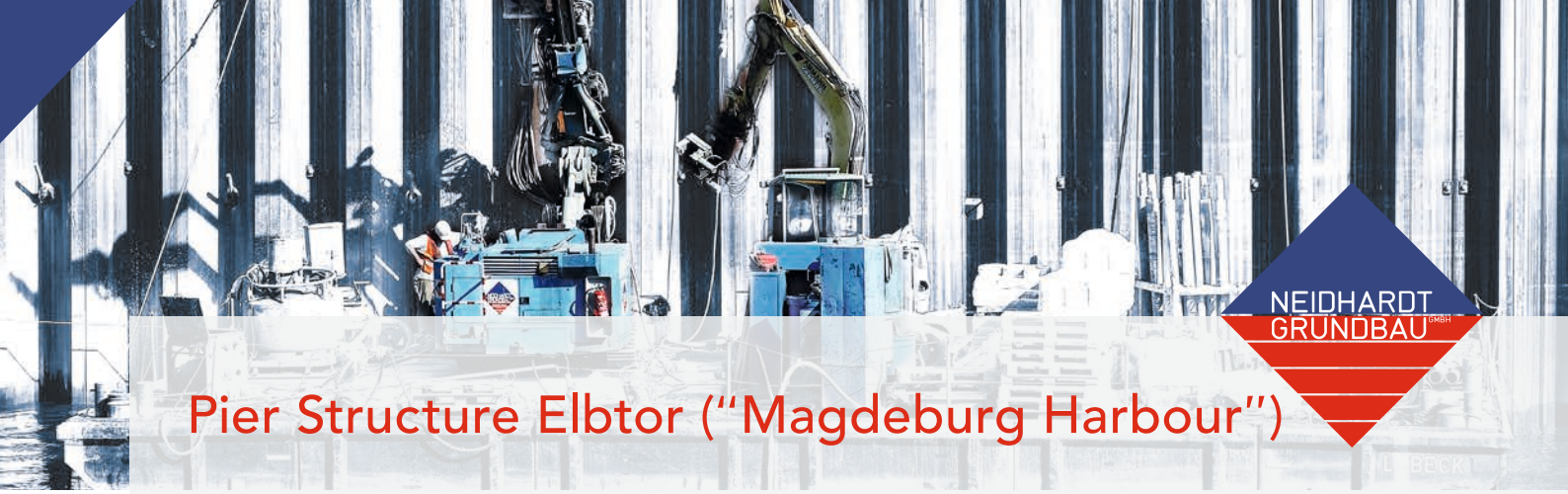

Pier Structure Elbtor (“Magdeburg Harbour”)

Project Owner:

HafenCity GmbH

Client:

Consortium Pieranlage Elbtor (HC Hagemann GmbH & Co. KG, FR. Holst GmbH & Co. KG, Aug. Prien (GmbH & Co. KG))

Quick Info:

Micropiling works fort he new pier structure at the Elbtor quarter in the Hamburg HarbourCity with TITAN injection piles

Technical Information:

System:	TITAN injection piles 103/51
Quantity:	29 pcs.
Length:	26,00 – 30,00 m
Service Load:	670 – 1660 kN
Test Load:	1000 – 2210 kN
Technique:	self-bore pile drilling
Building Ground:	sands
Time Frame of Works:	July – September 2011

Enframed by the northern Brooktor Harbour, the southern Baaken Harbour, the western Magdeburg Harbour and the eastern Lohse Park, the so-called Elbtor Quarter is erected in the heart of Hamburg HarbourCity. In the course of the development of this area, a stilted pier structure is planned as a new pedestrian promenade inside the harbour basin along two adjacent building fields by spring 2012. We produced the tie-back injection piles for the necessary sheet pile walls to the north and to the south side.

Image 1

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Pier Structure Elbtor (“Magdeburg Harbour”)

Minimum spacings in between the injection piles had to be ensured for the posterior deep foundation of a landside wall with vertical bore piles. For that matter, the permissible deviation from the planned drill path was limited to ≤ 2 % instead of the otherwise common ≤ 3 % of the pile length. Out of the necessity for tide independence we took the planning of a heavy-duty steel scaffold for our 22 to pile rig in our own hands. The scaffold was laid in part on top of the sheet pile. The structural design calculation and mounting of the scaffold was done by the consortium Pieranlage Elbtor. Only with this kind of stable work platform, we were able to carry out our drill works with high precision. Therefore, all difficulties related to the alternative option of working from a swimming water pontoon could be avoided from the very beginning. During our injection piling works, we drilled through existing brick caissons. Because these structures were suspected to be full of gaps and holes, we installed protective steel pipes around the TITAN steel approx. 1,00 m into the load bearing sand in order to guarantee an adequate grout jacket in the upper layers for double corrosion protection. Through these steel pipes we proceeded with the production of our TITAN injection piles. The space in between caissons and steel pipes was filled with non-hardening bentonite in order to ensure that no loads were transmitted from into the existing building structures.

We accomplished this with an overburden drilling technique down to the lower depth of the steel pipe, after which we pulled out the inner bore casing. The space in between protective steel pipe and TITAN steel was filled with grout material. In order to observe the actual deviation from the drill path, we conducted bore hole surveys on all 29 injection piles through the inner diameter of the TITAN pipe. After completion of the acceptance tests, the previously cleansed inner diameter was filled with grout material. Our drill unit is depicted in Image 1 on top of the steel scaffold on the north side of the building field right in front of the picturesque Maritime Museum.

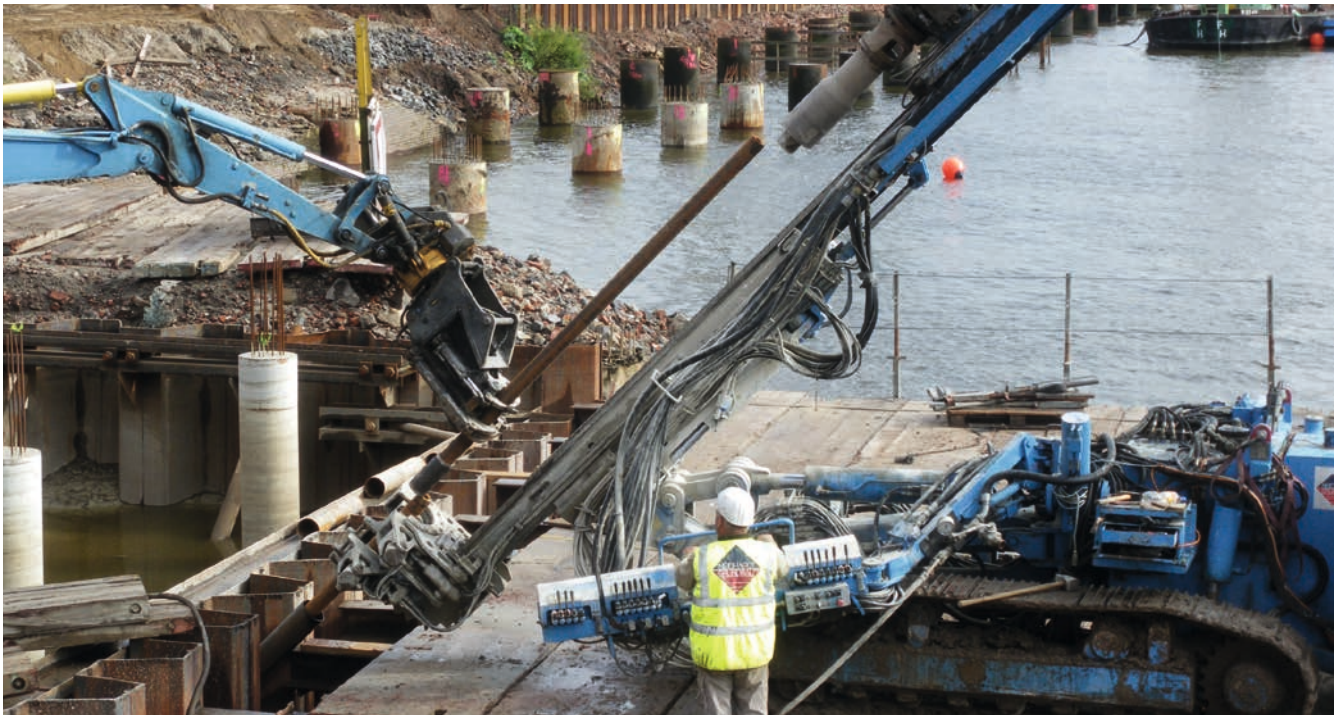

Image 2

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