

## Specialist Press Release

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### **Injection work with a sea view: Bauer Spezialtiefbau carries out safeguarding measures on the harbor breakwater on the island of Helgoland.**

**Helgoland, Germany** – Situated in the middle of the North Sea roughly 50 km away from the mainland, Germany's only island in the open sea is a place of pristine charm with a unique natural landscape. Long popular as a tourist destination, the island has a magical appeal for its visitors, many of whom reach the island by ship and disembark from the harbor in southern Helgoland. To continue providing these routes in the future, safeguarding measures are being carried out on the southern breakwater of the harbor over a length of roughly 70 m. The area of the breakwater under construction was destroyed in two sections during a storm surge in December 1954 and then reconstructed using wooden caissons that were filled with demolished concrete and debris. To safeguard these areas, the Wasserstraßen- und Schifffahrtsamt Elbe-Nordsee (Elbe and North Sea Waterways and Shipping Authority) tasked BAUER Spezialtiefbau GmbH together with BTR Bohrtechnik Roßwag GmbH & Co. KG to carry out injection work in a total of four phases. The goal of the work is to close up cavities beneath the breakwater cover and to establish a connection with the fill material from the 1950s in order to stabilize them and restore the structural stability of the southern breakwater.

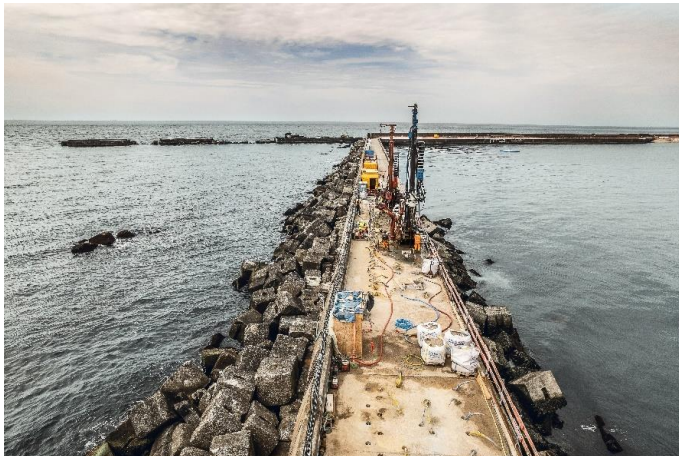
In first step, the contact joints between the breakwater cover and the stone ballast beneath it were filled with grout injections over the entire width of the breakwater. One particular challenge here was the follow-up injection work on the sea side: Under full stress due to weather factors, breaking waves and tides, an injection grout curtain was executed with rapidly binding polyurethane resins for temporary shielding of the subsequent work phases. Because these resins require water in order to react, the injection sequence was dependent on the tide level and required precise planning.

The preparatory measures in phase 2 made it possible to ultimately complete the additional work with less influence from breaking waves and tides. The injection curtain on the harbor side was executed in a comparable manner to the work on the sea side, but using a combined bentonite-polyurethane mixture as the injection agent. This resulted in longer binding times compared with pure polyurethane resin injection. To protect the previously executed injection curtain from phases 2 and 3, a solid injection with a cement slurry was executed in the last step to completely fill the cavities in the breakwater and thus fully restore its structural stability.

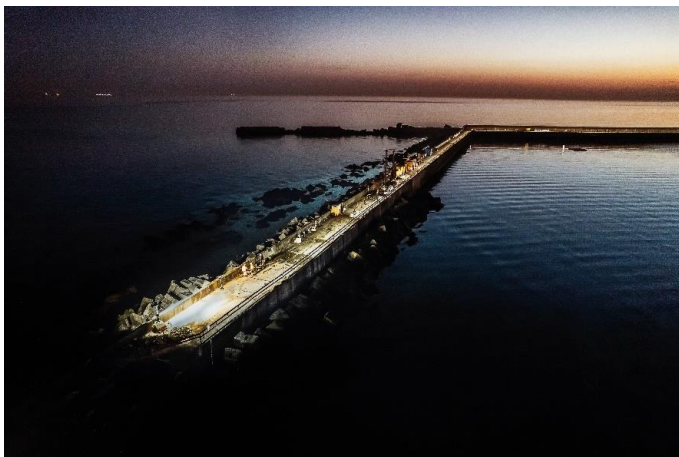
“The work on the first section has already been concluded. In the second section, the bentonite injections for phase 4 are currently being constructed,” explains Jonathan Rehor, site manager of BAUER Spezialtiefbau GmbH. “The work began in April 2022 and will be completed on schedule in October.”

Apart from the difficult working conditions in the “open sea,” the exposed location of the work front is also a unique factor and a challenge: “Both the material coordination for transport to the island and the logistics on the island itself were extremely labor-intensive,” continues Jonathan Rehor. “In addition, all the material must be carried from the storage area on the island using wheel loaders over the narrow breakwater to the work front roughly 600 m away. The total distance traveled works out to 1,800 km.” In addition, it is not typical for a total of four different types of injection to be executed on one site: “A thoroughly unique project surrounded by one-of-a-kind scenery.”

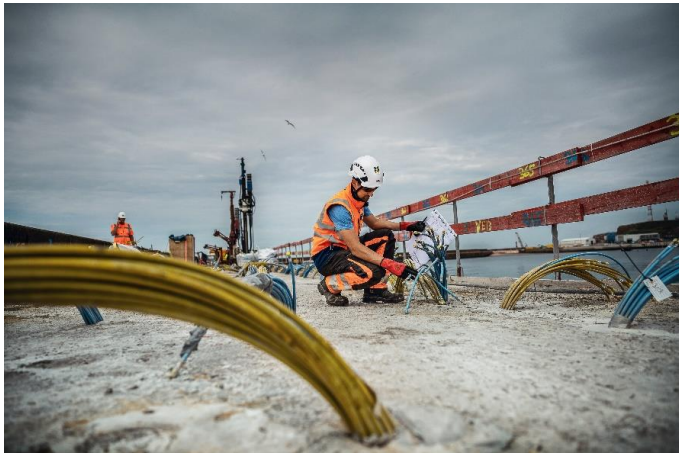
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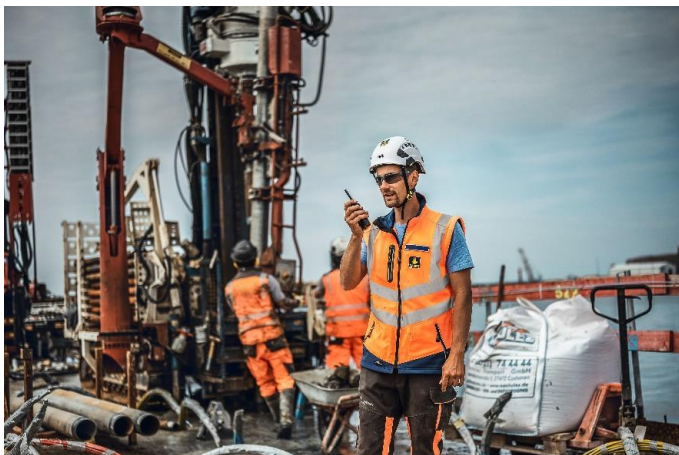
(1) The drilling using the sonic drill method down to a depth of approximately 12 m and the installation of the valve pipes were carried out by BTR.



(2) The supply of the site from the site installation area to the southern quay of the harbor occurred over a breakwater roughly 600 m in length.



(3) In each of the nearly 320 boreholes, 18 to 20 valves were installed at vertical intervals of 0.5 m.



(4) Site Manager Jonathan Rehor

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### **About BAUER Spezialtiefbau Group**

BAUER Spezialtiefbau GmbH, the original parent company of the BAUER Group, has been a major driving force in the development of specialist foundation engineering. It carries out all of the customary processes of foundation engineering, primarily for excavation pits, foundations, cut-off walls and ground improvements on a worldwide basis. In doing so, BAUER Spezialtiefbau GmbH works closely together with their over 50 subsidiaries and branches across the globe. Regional networks around the world allow for the quick and flexible application of machines, teams and expertise. Bauer Spezialtiefbau offers their customers individual, creative and economical specialist foundation engineering solutions for demanding construction projects, from planning through to execution. More at [bst.bauer.de](http://bst.bauer.de)

### **About Bauer**

The BAUER Group is a leading provider of services, equipment and products dealing with ground and groundwater. The Group can rely on a worldwide network on all continents. The Group's operations are divided into three forward-looking segments with high synergy potential: Construction, Equipment and Resources. Bauer profits enormously from the collaboration of its three business segments, enabling the Group to position itself as an innovative, highly specialized provider of products and services for demanding projects in specialist foundation engineering and related markets. Bauer therefore offers suitable solutions to the world's greatest



challenges, such as urbanization, the growing infrastructure needs, the environment, as well as water. The BAUER Group was founded in 1790 and is based in Schrobenhausen, Bavaria. In 2021, it employed about 12,000 people and achieved total Group revenues of EUR 1.5 billion worldwide. BAUER Aktiengesellschaft is listed in the Prime Standard of the German Stock Exchange. More information can be found at [www.bauer.de](http://www.bauer.de). Follow us on [Facebook](#), [LinkedIn](#) and [YouTube](#)!