

Project Scharbeutz:

Dance of the diggers— New pressure drainage systems convey rainwater from the interior of Scharbeutz into the Baltic Sea



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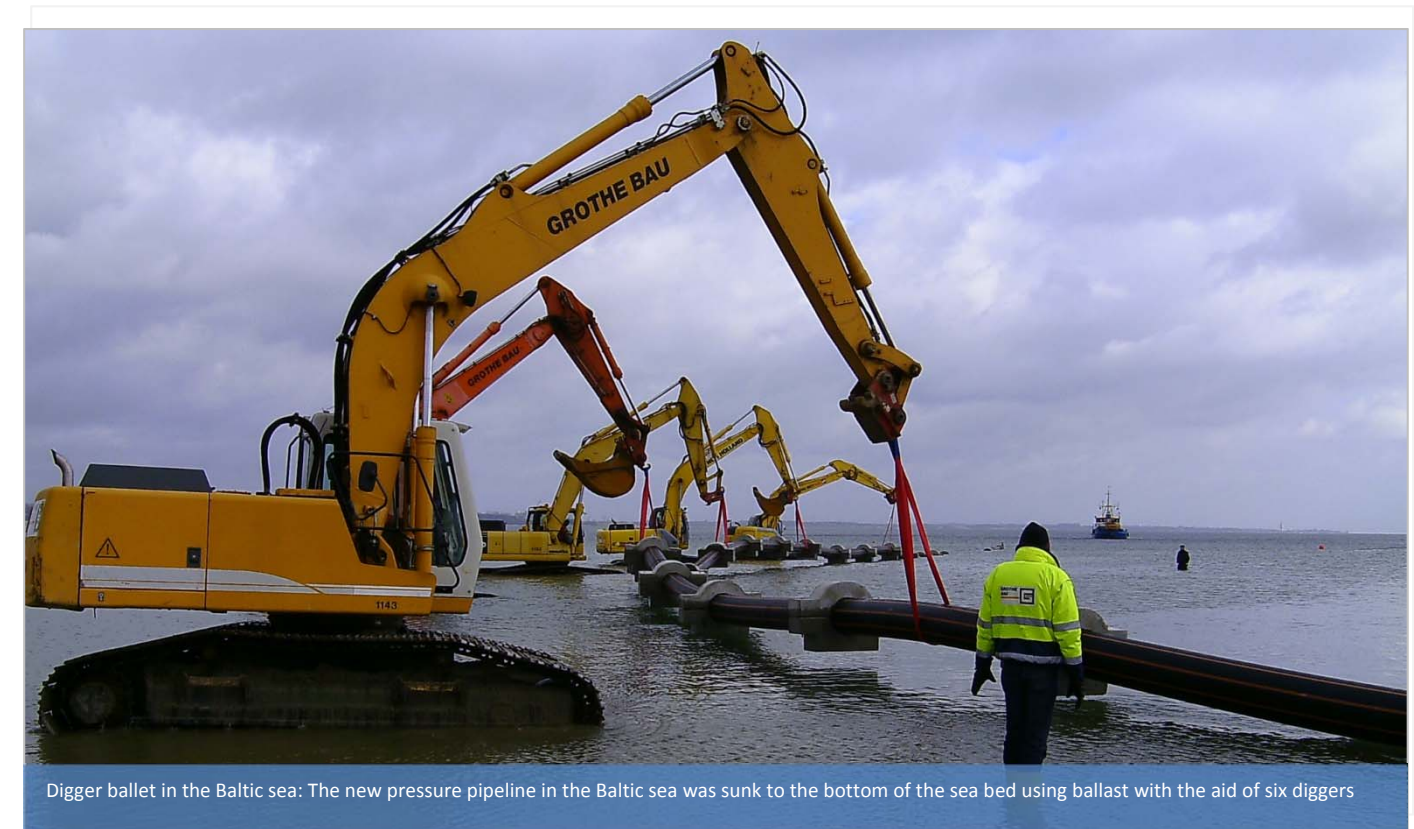
New pressure drainage systems convey rainwater from the interior of Scharbeutz into the Baltic Sea

| Project data | |
|----------------------------------|--|
| Project description: | New arrangement of the Heidebek and Gösebek drainage systems in Scharbeutz |
| Challenges: | Flood protection through new pressure pipelines into the Baltic Sea without intervention in the beach area with promenade and beach wall |
| Solution: | Construction of a new drainage system with large diameter pipes made from polyethylene using trenchless installation methods |
| Installation: | Use of existing pipelines (relining) and horizontal drilling procedures as well as installation of a sea pipeline in underwater trenches by floating it into position |
| Pipe material used: | <p>Total quantities of pipe:</p> <p>300 m 450 x 26,7 mm egeplast PE 100-RC 108 m 450 x 26,7 mm egeplast SLMR RCplus 72 m 560 x 33,2 mm egeplast SLMR RCplus 228 m 560 x 33,2 mm egeplast PE 100-RC</p> <p>Moulded components:</p> <p>2 egeplast elbows 560 mm PE 100-RC 30° 2 egeplast elbows 450 mm PE 100-RC 30° 3 egeplast elbows 450 mm PE 100-RC 25° 1 egeplast tee PE 100 560 mm 90° 1 egeplast tee PE 100 450 mm 90°</p> |
| Parties involved in the project: | <p>Client: Wasser- und Bodenverband Ostsee with significant involvement of the Scharbeutz local authority</p> <p>Designers: Ingenieurbüro Wald & Kunath, Stockelsdorf</p> <p>Installation company: Grothe-Bau GmbH & Co. KG, Lübeck</p> |

Using horizontal directional drilling in the Baltic Sea

A new pressure pipeline with an outer diameter of 450 mm was required to extend the Heidebek drainage. At high water levels this now pumps rainwater into the Baltic Sea around 240 m from the shore line. The pipeline was inserted from the pump station to the beach using the HDD procedure. Using trenchless installation technology, the beach avenue, promenades, sand dunes and coastal protection measures were left untouched by the installation work. Coated pipes for trenchless installation methods were inserted in order to prevent damage to the pressure-bearing pipe wall.

The installation in the Baltic Sea took place according to a proven, extremely simple but effective procedure: the pipeline was welded together at the shore line, the ends temporarily sealed and ballast applied. A trench was excavated underwater on the sea bed using a dredger. A tugboat pulled the pipeline out to sea and transported it to the correct position. The pipeline was flooded precisely over the pipe trench and it sank down into the sea bed. The section was finally backfilled with approx. 1 m sand again so that it presented no future danger either to bathers or to shipping.



Digger ballet in the Baltic sea: The new pressure pipeline in the Baltic sea was sunk to the bottom of the sea bed using ballast with the aid of six diggers

The material selected for this section of pipeline was a wastewater pipe made from PE 100-RC materials. Stress cracks, for example resulting from stones pressing against the pipe wall, are not to be expected with this pipe material.

In the case of the Gösebek drainage the existing DN 800 concrete pipeline was converted to a pressure pipeline up to its discharge in the beach area. A PE pipeline with dimensions OD 560 mm was inserted into the concrete pipe using the relining procedure, and the annular gap was subsequently professionally grouted. The installation work with this procedure also affected neither the beach promenade, beach avenue nor the beach wall. In the beach area the new pressure pipeline with OD 560 mm made from PE 100-RC material was sunk down to the -3.5 metre line below sea level onto the bed of the Baltic Sea using ballast as described above. Elbows and tees made from PE 100-RC from the same product range were deployed to change directions in both construction measures. •



The new drainage pipelines were sunk in a pipe trench on the sea bed using ballast.



Through the dunes under the beach into the Baltic Sea: no burden was placed on these areas by the horizontal drilling procedure.

Consulting:



The selection of plastic pipe materials and systems for underground installation has extremely long-term implications. Designed for a service-life of several generations, pipelines are scarcely accessible for retrospective modification once they have been installed:

- High-value surface occur
- Building construction follows underground activities
- Repair costs in case of damage can be a multiple of the original investment amount
- Diversion of traffic and blocking of roads is scarcely possible with today's high traffic densities

For these reasons, planners, project clients and operators of piping systems are confronted with the challenge of gathering the best possible knowledge of the potentials and limitations of pipe materials before a decision is made. In addition, the costs for underground engineering must also be taken into account. Actual pipe-system costs rarely make up more than 15 % of total costs, whereas the underground work and restoration of the surface account for 85 % or more. The use of trenchless installation methods thus presents significant cost-reduction potentials.

The egeplast team of consultants will be happy to help you in every decision-making phase.

Contact: technik@egeplast.de, +49.2575.9710-0