

Secutex Soft Rock[®], Secugrid[®] - Coastal defence and flood protection - Scharbeutz, Germany

Coastal defence and flood protection in the city of Scharbeutz, Germany

- **Project Name**
Coastal defence and flood protection in the city of Scharbeutz, Germany
- **Client**
City of Scharbeutz, Scharbeutz, Germany
- **Overall planning and construction supervision**
WTM Engineers GmbH, Hamburg, Germany
- **Construction**
becker bau GmbH, Neustadt i. H., Germany
- **Products**
Secutex[®] Soft Rock R 601
Secugrid[®] 30/30 Q1





Flood protection with funds from the state of Schleswig-Holstein, Germany

The approx. 5.4 km long coastal strip of the city of Scharbeutz, which is frequently used by tourists is characterised by a wide sandy beach with a beach wall and a promenade, road and buildings behind it. This stretch of coast is largely unprotected from storm surges from the northeast.

Previously, the sea wall provided some flood protection, but this was inadequate for heavy storm surges. The sandy sea wall was not high enough in large sections and could not withstand the loads caused by high water levels and wave run-up in the event of a storm surge. During Baltic storm surges severe erosion occurred on the sea wall, resulting in a total loss of flood protection.

The coastal defences needed to be improved to protect the residents in this area. The state of Schleswig-Holstein subsidised this construction project.

Coastal protection in harmony with nature

Coastal defences have the task of ensuring safe, permanent and seamless protection against storm surges as well as securing buildings and infrastructure in the flooded area. A technically satisfactory, sustainable and economically flood defence structure that considered both ecological concerns and the interests of the population and tourism had to be found.

As the planned construction project is located within a protected biotope, the beach wall, an environmental impact study and a landscape conservation plan were drawn up and agreed upon with the nature conservation authorities.

Compact design was required - the best solution was a flood protection wall

During the planning phase, several options were examined for the implementation of the coastal protection measure. Only the 15 - 30 metre wide sea wall between the promenade area used by tourists and the beach was available for the flood protection system. The construction of a dyke would not have been possible for reasons of space alone. A compact construction method had to be found that would guarantee safe flood protection and blend well with the local landscape.

The optimum solution has proven to be the construction of a flood protection wall, which was positioned around 4.0 metres downstream of the existing promenade. This allowed the wall to be fully integrated into the beach wall and the embankments to be designed in a near-natural way by using plants in accordance with the location.

The flood defence wall consists of a non-anchored sheet pile wall with a reinforced concrete superstructure and scour protection made of geotextile sand containers.

Protection against erosion and scouring: Naue Secutex® Soft Rock sand container

To reduce retrogressive erosion and scour formation and to absorb wave energy, erosion protection consisting of geotextile sand containers was installed on the waterside in front of the flood protection wall. Naue Secutex® Soft Rock sand containers were installed in 5 layers and filled with locally available sand.

The upper sand container layer, which does not receive any load from sand containers above it, was designed with larger dimensions and additionally enclosed with a Naue Secugrid® 30/30 Q1 geogrid and connected to the reinforced concrete wall in a tension-proof manner.

In front of the multi-layer container packing, a flexible toe protection made of geotextile sand containers was also installed. Naue Secugrid® 30/30 Q1 with a high tensile strength was wrapped completely around the sandbags and placed under the bottom layer of sand containers at the rear to secure the position. This allows the sand containers and Secugrid® geogrid to adapt to the new shape of the terrain in the event of scouring, i.e., to cover the scour ridge without being washed away.

Saving costs and resources with Secutex® Soft Rock sand containers

Using the locally available sand as filling material for the Secutex® Soft Rock sand containers saved material transport and costs and conserved resources. In comparison, if crushed rock had been used for erosion protection the extraction, delivery and installation of around 60,000 tonnes of granular fill would have been required.

After completing the flood protection wall and the erosion protection measures, the beach wall was restored by backfilling the sand stored at the side. Finally, the surface of the flood protection wall was planted.

Existing entrances and access roads to the beach were formed as stakes, which are closed with dam beams in the event of a storm surge.

The coastal protection measure in the city Scharbeutz will sustainably improve flood protection. The structure guarantees protection against flooding up to a design water level of NN+2.50m.

The structure blends in with the town and landscape and, in conjunction with the remodelling of the promenade and the extension of the beach avenue. This will significantly increase the attractiveness of this coastal section.

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