



# BREAKWATER

DAMEN CIVIL PRODUCT

## GENERAL

Ref/No	13
Basic functions	Harbour and shore protection

## DIMENSIONS (APPROX.)

Length	Varied	m
Width	Varied	m
Height	Varied	m
Area	Varied	m <sup>2</sup>
Volume	Varied	m <sup>3</sup>

## CONSTRUCTION

Types of breakwaters:

- Sea backed structure linked to shore (water on both sides);
  - Sea backed structure positioned offshore (water on both sides);
  - Land backed structure.
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- A breakwater is founded on bottom level.
  - Bottom bearing capacity improvement prior to the main construction;
  - This can be done by dredging and/or compacting of the bottom layers;
  - To be constructed by the use of mass or a revetment slope.

## INSTALLATION

- Depending on local circumstances, to be determined;
- Navigational lights can be added for better visibility to ships.

## DESCRIPTION

A breakwater is basically designed to protect the shores and harbours from influences of swell. It absorbs the energy of waves that hit it and it provides vessels opportunities to berth in relatively calm waters. Damen Civil does this by using mass (e.g. caissons) or by the use of a revetment slope (e.g. with rock or concrete armour units).

The function of a breakwater is to lower the wave heights to acceptable height increase the force of the waves. Several types are possible. Solid, partly open or a construction based on piles with open screens.

## TOOLS AND EQUIPMENT

A breakwater can be constructed from shore or from a barge / ship. The chosen method and accompanying required tools and equipment can only be determined when all local circumstances are known.

Backhoes and other hoisting equipment are available for construction. Either on shore or on a barge / ship.

## REMARKS

A breakwater is an one off product and has to be designed in accordance with the local circumstances from wind, waves and currents. Therefore a standard product can't be determined.

These examples are strictly informative and not binding both on materials and/or shape.

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BREAKWATER (CONCRETE ARMOUR) EXECUTIONAL WORKS



FLOATING BREAKWATER

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