



Experimental facility Atlantic Basin

The Atlantic Basin is a multifunctional facility and at present the only one of its kind in the world. With its total size of about 650 m², waves and (tidal) currents can be simulated. In the test section a closable pit of 130 m² and a depth of 0,5 m is available which allows for modelling of a mobile bed. A sediment sieve is constructed at the downstream side for the collection of lightweight material in morphological tests. The wave generator is positioned at one of the short sides and consists of 20 wave paddles driven by a hydraulic system.

The independently controlled wave paddles make it possible to generate oblique waves and to compensate for waves that are reflected by structures in the basin. A current can be generated via a pumping system either following or opposing the waves. Depending on the project-specific needs, the basin layout can be modified e.g. by constructing narrower wave flumes in the basin. Also, the Atlantic Basin is equipped with state-of-the-art instrumentation, a gantry crane and access bridges.

Application areas

The Atlantic Basin can be used for coastal, river, harbour and offshore projects. This basin is a wide flume for investigations related to flow forces, discharge coefficients, specific design details, bed protection and morphological impact of hydraulic structures. The combination of wave generation with a pumping system allows for realistic simulation of sea waves interacting with a current. This is not only of interest for research on wave-current interaction but also essential for a number of situations, such as scour around offshore structures. In addition to that, water levels can be adjusted which allows for the simulation of tidal and non-tidal water level fluctuations.

Projects

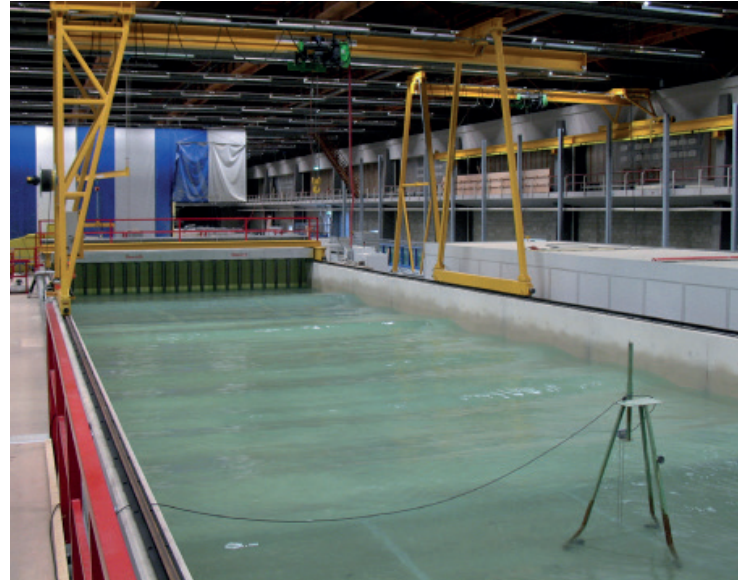
We are involved in a wide range of river, coastal, harbour and offshore projects. Typical studies are related to:

- Stability of breakwaters (trunk sections and roundheads)
- Scour around piles, jackets, jack-ups, gravity base structures and pipelines
- Revetments
- Scour protection and pipeline covers
- Stability of groynes, sills, bed protections, intake and outfall structures
- Forces on structures
- Storm surge barriers
- Sluices

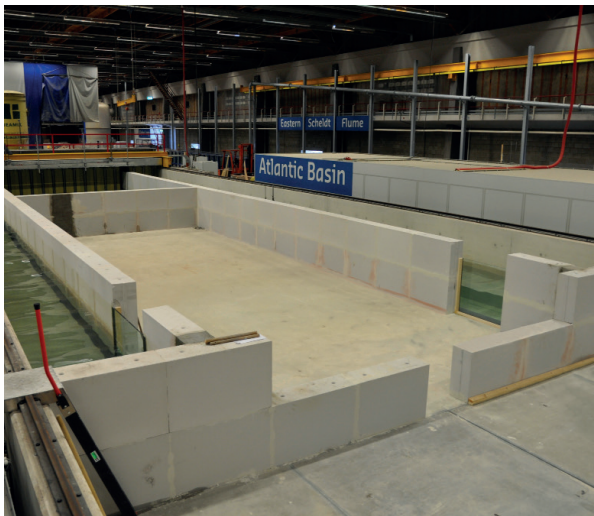




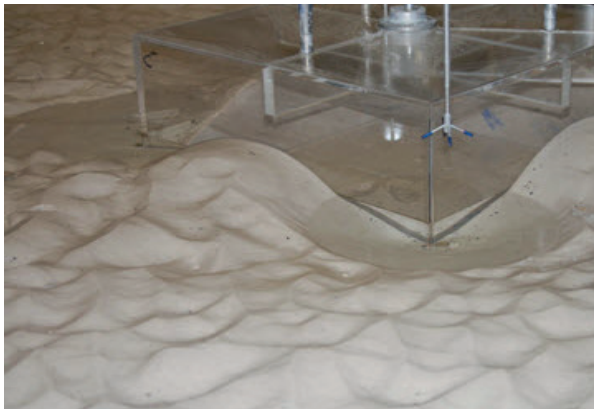
Testing the stability of a breakwater roundhead



Twenty independent wave paddles generate short or long-crested waves



In the Atlantic Basin several wave flumes can be constructed



Scour around an offshore structure

Technical specifications

Wave basin

- Length: 75 m
- Width: 8.7 m
- Height: 1.3 m
- Maximum water depth: 1.0 m

Wave generator

- Wave board type: segmented piston-type
- Width of wave generator: 8.7 m
- Height of wave generator: 1.3 m
- Frequency range: 0 to 2 Hz
- Directional spreading: yes
- Equipped with Active Reflection Compensation

Wave characteristics

- Maximum regular wave height $H_{max,r}$: 0.45 m
- Maximum significant wave height H_{m0} : 0.25 m

Pumping system

- Maximum pumping capacity: 3.0 m³/s
- Current-wave-angle: 0° and 180°



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